WWW.LAC2026.COM

LANDSCAPE ARCHAEOLOGY CONFERENCE

18-20 March 2026

University of Bamberg

Program

IALA

LAC 2026

ARCHAEOLOGICAL PROSPECTION

GOOD LAC!

Welcome to University of Bamberg

2026

Welcome to Bamberg!

If you arrived by train, you may have seen the railway greeting: *Benvenuti a Bamberga! Oder auch: Grüß Gott im fränkischen Rom*. These greetings reflect what the Landscape Archaeology Conference 2026 aims to be during these four days in March: international and open-minded, yet deeply connected to local heritage.

We believe Bamberg offers an inspiring setting for three days of discussion on ancient landscapes. Bamberg is often called “Franconian Rome.” Built on seven hills and shaped by its many churches, the city blends history and landscape in remarkable ways.

The small island in the River Pegnitz, home to the medieval town hall, recalls Rome’s Tiber Island. As you explore the city, you will discover a landscape in miniature: steep slopes rising to Altenburg fortress, a river valley with distinct ecological niches, the former fishermen’s quarter known as “Little Venice,” and the unique market garden district–the *Gärtnerstadt*–where generations have cultivated crops, and some continue to do so today. The historic city center and its market gardens have been recognized as UNESCO World Heritage since 1993.

We are delighted to welcome more than 500 participants to the University of Bamberg. Founded in 1647, the university now hosts around 10,400 students across four faculties: Humanities; Social Sciences, Economics and Business Administration; Human Sciences and Education; and Information Systems and Applied Computer Science. Interdisciplinary collaboration is central to our work. Major research areas include Medieval Culture and Society, Analysis and Preservation of Cultural Heritage, and Digital Humanities.

Archaeology at Bamberg places landscapes at the heart of research and teaching. Our department brings together Medieval and Post-Medieval Archaeology, Prehistory, the Archaeology of the Roman Provinces, and Archaeological Prospection. Our projects range from prehistoric occupation on the Franconian Alb and Roman settlement in southern Germany’s river landscapes to medieval productive landscapes around Bamberg. We also investigate human–environment interactions in the Wiesent Valley and the spatial organization of the Celtic hillfort at Staffelberg. Beyond Germany, our research extends to prehistoric terraces in Switzerland, mountain landscapes in Italy, and mining regions in Costa Rica.

Preparing LAC2026 has strengthened collaboration within our institute and reminded us of the shared questions that connect our work. Now we look forward to learning from you. We are eager to hear about your research, exchange ideas, and build new connections.

May this conference broaden our perspectives, spark lively discussion, and foster lasting friendships.

We wish you a wonderful and inspiring LAC 2026!

CONTENT

OPENING CEREMONY and Icebreaker

Wednesday 18 March 2026, 18.00-21.00
Aula of University of Bamberg, Dominikanerstr. 2

The conference opening and Icebreaker will take place in the former Dominican Church at Dominikanerstr. 2. The church was built in the late 14th century and has the largest medieval roof in Bamberg. In the following centuries, it was completely restructured (17th century) and decorated in baroque style (18th century). After the church was secularized in 1804, it initially served as a military base and later as the seat of the Bamberger Symphony Orchestra. Since 1999, it has served as the Aula of the University of Bamberg.

PROGRAMME:

18.00: Welcome addresses:

- The LAC2026 organizing committee
- Prof. Dr. Kai Nonnenmacher, dean of the Faculty of Humanities
- Dr. Guillermo Reher Diez, president of the International Association of Landscape Archaeology (IALA)

18.20: Keynote 1:
Prof. Dr. Markus Fuchs

18.40: Keynote 2:
Dr. Kristina Winther-Jacobsen

19.00 – 21.00: Icebreaker with drinks and snacks

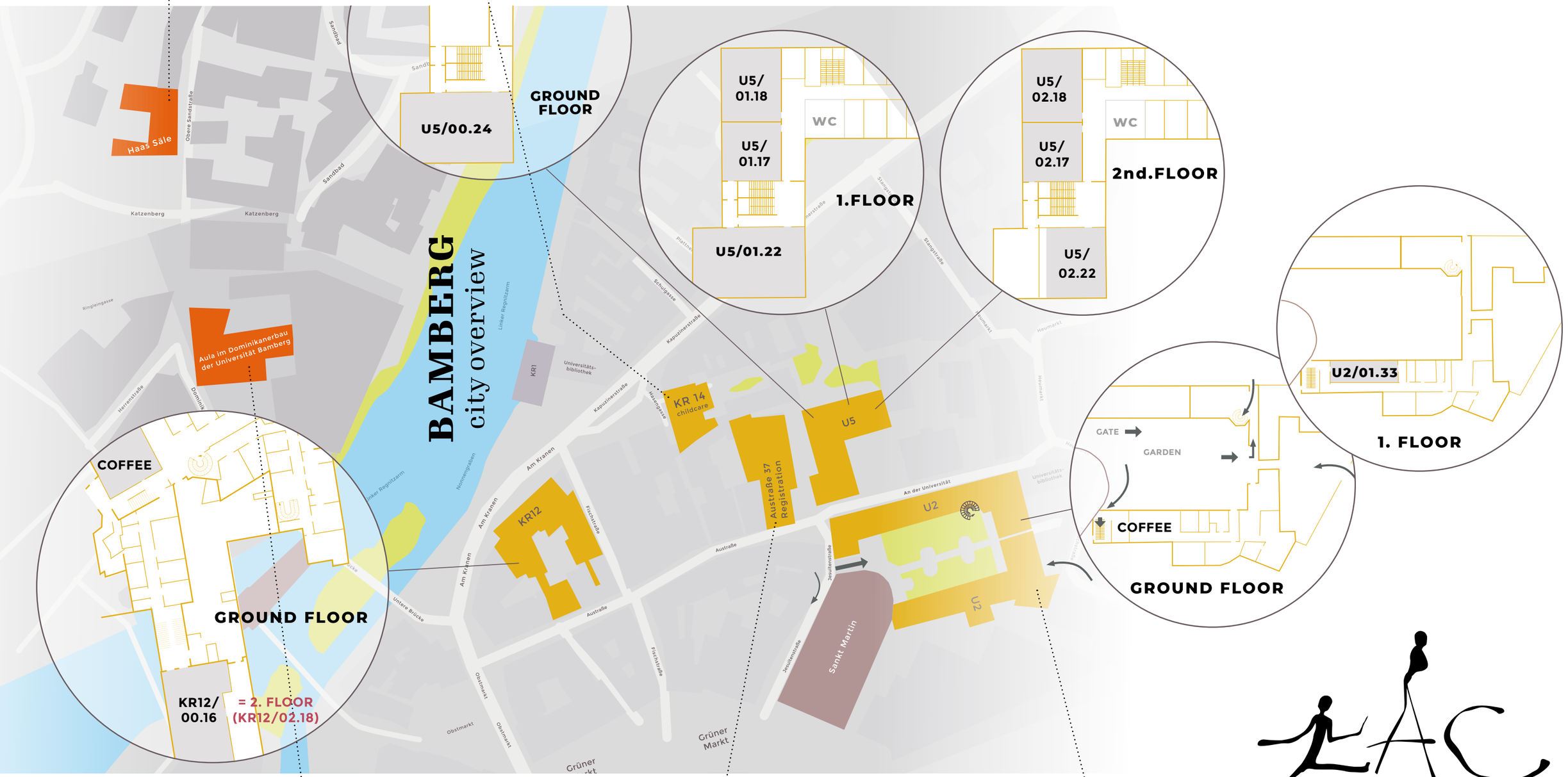
LAC PARTY

Friday, 20 March 2026,
21.00 – 02.00
Haas Säle, Obere Sandstraße 7

CHILDCARE ROOM

The childcare room is in Am Kranen 14 (building KR14, room 00.03, ground floor).

A qualified babysitter service is available at no extra cost. Please let us know before 28 February if you wish to use this service.



OPENING CEREMONY

and Icebreaker
Wednesday 18 March 2026,
18.00-21.00
Aula of University of Bamberg,
Dominikanerstr. 2

REGISTRATION

and **conference support**
Austraße 37 (Schwanenhaus)
Open: Tuesday 17 March **15-18h**
Wednesday 18 March **08-18**
Thursday 19 March **08-18**
Friday 20 March **08-12**

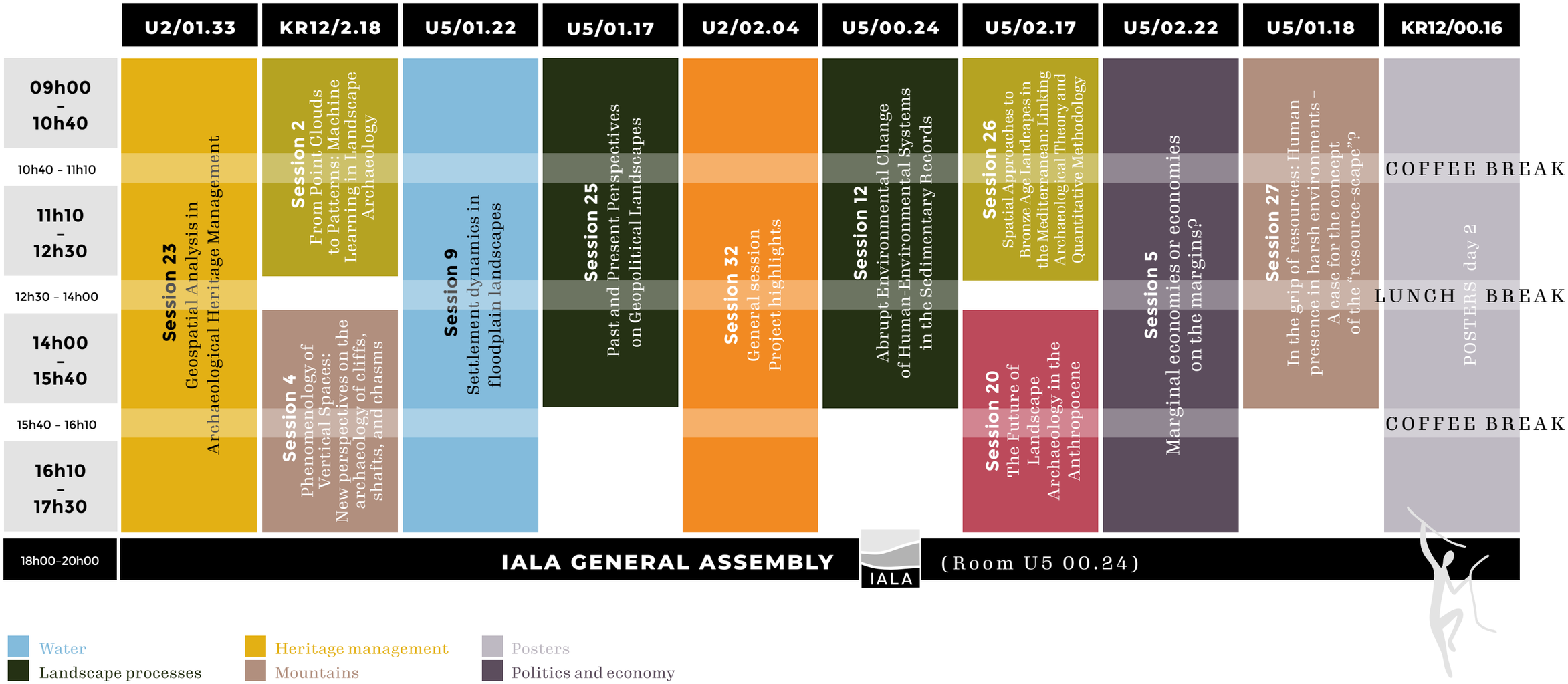
CONGRESS VENUE

University of Bamberg
Faculty of Humanities
An der Universität 2 and 5
(Buildings U2 and U5);
Am Kranen 12 *(Building KR12)*
96047 Bamberg

LAC 2026

	U5/02.18	U2/01.33	U5/01.22	U5/01.17	U5/02.17	U5/00.24	U5/01.18	U5/02.22	KR12/00.16
09h00 – 10h40	**Session 3** Side effects from the construction of large linear infrastructure projects in Europe – chances for new insights on our landscapes	**Session 29** Landscapes on the Border: (Public-) Archaeological Perspectives on Boundaries and Marginal Spaces	**Session 6** Coastal landscapes through the ages	**Session 8** Exploring the Decolonisation Discourse in Mountain Landscapes: Rethinking Margins, Methods, and Meaning-Making	**Session 30** Manipulated and artificial bodies of water as archaeological landscape relics	**Session 7** Landscapes of change: data, methods, interpretations	**Session 13** Dynamic adaptations on dynamic landforms: Multi-disciplinary perspectives on Quaternary populations	**Session 22** Geoarchaeology in Vertical Landscapes – Methods, Potentials, and Emerging Questions	POSTERS day 1
10h40 – 11h10	COFFEE BREAK								
11h10 – 12h30									
12h30 – 14h00	LUNCH BREAK								
14h00 – 15h40									
15h40 – 16h10	COFFEE BREAK								
16h10 – 17h30							IALE Working Group Meeting		
18h00–21h00	**OPENING CEREMONY** with Keynotes and Icebreaker (Aula, Dominikanerstr. 2)								

Water
Landscape processes
Heritage management
Mountains
Posters
Politics and economy
LAC Events



- Water
- Landscape processes
- Methods
- Heritage management
- Mountains
- Discussion
- General Session
- Posters
- Politics and economy
- LAC Events

	U5/02.22	KR12/2.18	U5/01.22	U5/01.17	U2/01.33	U5 / 01.18	U5/00.24	U5 02.17	KR12/00.16
09h00 – 10h40	**Session 21** Forests as Archives: Interdisciplinary approaches to explore the woodland geoarchaeological record	**Session 18** Tracing back historical land-use and its legacies: common insights and p erspectives of landscape archaeology and historical landscape ecology	**Session 31** What is the future of surface survey? Rethinking new and old methods for landscape archaeology	**Session 17** Living Landscapes: Transdisciplinary Approaches to Heritage and Environment in Pompeii, the Amalfi Coast and beyond	**Session 15** Terraced landscapes as longterm socio-ecological archives	**Session 14** Re-discovering Mountainscapes: An interdisciplinary approach to mountainous areas	**Session 28** Landscape Archaeology of Riverine Environments	**Session 10** Modelling demography through archaeological data: from theoretical approaches to global case studies	POSTERS day 3
10h40 - 11h10	COFFEE BREAK								
11h10 – 12h30									
12h30 - 14h00	LUNCH BREAK								
14h00 – 15h40				**Session 24** Diachronic Change, Communal Agency and shifting Power Relations in Rural Landscapes					
15h40 - 16h10	COFFEE BREAK								
16h10 – 17h30									
20h00-2h00	**LAC PARTY WITH DJ EARTH FIND & WIRE** (Haas-Säle, Obere Sandstr. 7)								

Water
Landscape processes
Methods
Mountains
Discussion
Posters
Politics and economy
LAC Events

09:00-10:40 Session 3a:
Side effects from the construction of large linear infrastructure projects in Europe - chances for new insights on our landscapes

CHAIRS: *Florian Hirsch and Holger Schweitzer*
LOCATION: U5 / 02.18

09:00 *Colm Moloney*
Landscapes with Lineage – reconstructing a rich Irish archaeological landscape through the application of interdisciplinary studies in advance of motorway construction

Archaeological investigation in Ireland has been transformed by the massive road building programme which was undertaken over the last 25 years. Landscapes with Lineage: Archaeological Discoveries along the M9 motorway in south Kildare (co-authored by Colm Moloney, delivered by Rubicon Archaeology) is the latest archaeological monograph resulting from this national development programme. The publication focuses on a motorway development covering approximately 40 km which resulted in the excavation of 97 individual archaeological sites covering approximately 8,000 years of human activity. These sites form a number of distinct landscapes ranging from the Bronze Age through to the medieval period and covering ritual, domestic, industrial and agricultural activities. This paper reviews the landscape focused approach employed on this project, with extensive use of environmental archaeology and scientific dating to reconstruct a number of landscapes through time. Consideration is given to recent developments in archaeological science and potential benefits that could be gained from their application in the future. The potential of social value and public outreach to maximise 'value' of these linear projects will also be discussed. The paper will conclude with a summary of lessons learned and suggested approaches to delivery of large scale archaeological projects ahead of major linear developments.

09:20 *Marjaana Kohtamaki, Martin Straßburger and Michael Franz*
Approaching German Landscape Archaeology via five states through a geospatial lens along the Suedlink route

At a length of 700 kilometres, the SuedLink underground power cable project stretching from northern Germany to Bavaria and Baden-Württemberg provides a unique cross-sectional insight into the history of various landscapes through a range of geospatial methods in archaeology. The commercial project allows field testing of geospatial methods in a range of archaeological settings typically not within the scope of academic research projects. INFRA JV delivers parts of the archaeology in this project in five states enroute. This offers a chance for international teams to collect geospatial data of the commercial excavation works. A challenging task is the professional and structured processing of data from the sites on the planned routes. Employing a combination of metric survey and GIS based Webmaps, the highlights of trenching and excavations will be shared. The metric survey data is complemented by drone imagery and 3D modelling work of key sites along the route. This empirical geospatial data will be explored through the lens of the LiDAR imagery and geophysics, showing how both invasive and non- invasive methods tell the story of the landscape. Potential future avenues for involving 3D laser scanning site capture along the project route will also be explored.

09:40 *Floris Beke, Sophie Barbaix and Caroline Ryssaert*
Tracing Landscapes: Archaeological Insights from 25 Years of Linear Infrastructure Research in Flanders (Belgium)

In 2024, a synthesis of 25 years of large-scale linear-infrastructure archaeology in rural Flanders revealed an unprecedented archaeological dataset. The analysis shows that such projects challenge established archaeological expectation models and provide a far more representative picture of human activity across diverse landscapes and occupation densities. The study concluded with a set of recommendations, arguing that the potential of these datasets for understanding long-term landscape development remains underexploited.

Building on these recommendations, new field investigations using adapted prospection methods were undertaken along a 100 km pipeline transect crossing loess, sandy, and coastal polder regions. The results offer new insights into the evolution of rural agrarian landscapes and resource-extraction practices from the Metal Ages to the modern period. Previously unknown buried palaeosoils, palaeolakes, and Stone Age sites were identified. In the coastal zone, buried marshlands and tidal channels were mapped and sampled, while the discovery of a motte castle strategically positioned to control waterways towards Bruges illustrates the complex co-evolution of natural and cultural landscape dynamics. This presentation highlights research methods and results that demonstrate how linear-infrastructure archaeology in Flanders provides new perspectives on human–landscape interaction, extending well beyond the scope of traditional excavations.

10:00 *Ann-Kathrin Biermann, Johannes Gilhaus and Markus Wolf*
Results and limits of non-invasive methods and techniques in commercial projects using the example of SuedLink

The SuedLink project is a key project of the energy transition in Germany. With a length of over 700 km and a route corridor up to 40 m wide, there are temporal risks due to archaeological finds. These are protected by the European Convention on the Protection of the Archaeological Heritage (1992), which Germany ratified in 2002. Archaeological protection measures are therefore part of the project approvals. TransnetBW (project sponsor southern section) implemented international best practices at an early stage. Potential impacts were minimized through optimized route planning and appropriate installation methods under a preservation principle. A coordinated system of non-invasive prospecting methods was employed. Their results were incorporated into the planning and provided valuable insights during the construction phase. The authors present the methods used and the results achieved. They show how a rich cultural landscape can be preserved through efficient processes despite economic pressures. Outlook: SuedLink is neither the only nor the last major project of the energy transition. Germany and Europe are facing an unprecedented industrial transition, in which the power grids play a crucial role. This will pose significant challenges for heritage authorities as well as the German market for archaeological services.

09:00-10:40 Session 29a:
Landscapes on the Border: (Public-) Archaeological Perspectives on Boundaries and Marginal Spaces

CHAIRS: *Viviane Diederich and Michael Preusz*
LOCATION: U2 / 01.33

09:00 *Simon Maddison and Mark Lake*
Iron Age Hillforts and the Continuity of Territory in England

Iron Age territories in Britain are not confidently understood. In contrast, medieval Anglo-Saxon territories are known in considerable detail, thanks to the remarkable Domesday Book. The question addressed in this project is to what extent these medieval territories might reflect earlier Iron Age boundaries. The 'Atlas of Hillforts of Britain and Ireland' provides a comprehensive source of data about these prehistoric features in Britain. The Domesday survey includes geographical details of the Anglo-Saxon shires, equivalent to modern counties, and their subdivision into the smaller units of Hundreds. This is now available as a detailed digital map. The authors have undertaken a detailed statistical analysis comparing these two very different datasets in order to quantify their relationship, and have established that it is statistically significant. These observations beg major questions about the nature of the relationships between Hillforts and Hundreds, and whether at least in some instances they could reflect deep time continuity of territory. This paper will report on the initial observations, latest results that also include Roman Villas, and the methods of analysis that have been developed as well as the key statistical results of the work to date.

09:20 *Stefan L. Smith*
Both Border and Heartland: Perceptions of and Human Activity in the North Arabian Desert, Past and Present

Few natural features conjure the idea of a „border" as clearly as deserts. The perception of vast areas with nothing but sand, devoid of life, cements the idea of impenetrability. However, this is often primarily a matter of perspective. In the North Arabian Desert, investigations have documented the presence of countless anthropogenic stone structures dating from at least the Early Neolithic, and even today semi-nomadic groups (Bedouin) operate there. For such populations, this was and is not a border, but their core heartland, from which they venture when economic or political needs dictate, but to which they ultimately return. Furthermore, while for the inhabitants of the fertile regions of Jordan and Iraq this desert is virtually synonymous with a political border, this is far from the perception of the Bedouin. This paper will present the North Arabian Desert in the context of the author's remote sensing and fieldwork research, and explore how it has only ever been a „border" to a subset of the region's populations. It will also consider ideas for how such perceptions can be addressed, both through a dissemination of evidence from the past and by being inclusive of the modern populations who call the desert home.

09:40 *Andrei Georgescu, Adrian C. Ardelean, Adriana Sărășan and Dragoș Diaconescu*
Crivina-Leopoldsberg: An Iron Age Settlement in a Border Landscape

The Iron Age hilltop settlement of Crivina-Leopoldsberg (Timiș County, Romania) offers a revealing case for exploring how boundaries shape human landscapes. Today, the site lies at the intersection of multiple borders: between the communes of Criciova and Nădrag, between Timiș and Caraș-Severin counties, and between the Poiana Ruscă Mountains and the Banat Plain. In antiquity, it occupied the periphery of the Dacian Kingdom's core area, later integrated into the Roman frontier zone after the conquest of Dacia. Archaeological research initiated in 2019 combined non-invasive investigations and excavations, documenting major landscape transformations carried out by past communities. A stratigraphic sequence of 1.6 m, supported by radiocarbon dates, indicates that extensive terrace leveling and reorganization occurred during the 1st century AD. Earlier material, dated to the 7th–2nd centuries BC, was found in secondary contexts, reflecting episodic use of the site before its monumental reshaping. By integrating topographical, stratigraphic, and material evidence, this paper examines how bordering processes—both physical and symbolic—manifested in this frontier environment. Crivina-Leopoldsberg exemplifies how peripheral spaces operated as dynamic zones of interaction, where political, environmental, and cultural boundaries were continuously negotiated and redefined.

10:00 *Gerasimos Trasanis*
Walls in the Uplands: Reassessing Fortified Sites in the Rural and Mountainous Landscapes of Grevena

Fortified sites often do not receive the necessary research attention, particularly in rural, mountainous, and semi-mountanous regions outside of the well-known and thoroughly studied ancient Greek world. The ongoing doctoral thesis examine the fortified sites of Grevena (northwestern Greece), historically part of Upper Macedonia and a key gateway between Epirus, Thessaly and Lower Macedonia.

More than twenty naturally and manmade fortified sites have been revisited and documented through traditional recording methods alongside GIS and drone-based mapping. Preliminary results indicate activity mainly during the Hellenistic and Roman periods, with traces of earlier and later use. Building techniques, materials, and site selection seem to reflect local Upper Macedonian characteristics, contrasting with the larger, more complex constructions of Lower Macedonia and southern Greece. Situating these sites within their mountainous context, the study argues that fortified landscapes operated as conceptual spaces that shaped and reflected a distinct mountainous identity. Evidence reveals both continuity and transformation in land use, highlighting long-term upland engagement. Far from marginal, these fortified landscapes functioned as arenas of defense, settlement, and connectivity, intergrating local communities into supra-local political and economic networks and moving beyond central/marginal dichotomies in landscape archaeology.

10:20 *Anna Swieder*
Archaeology of modern times at the former inner-German border in Saxony-Anhalt

The 342 km-long “Green Belt” in Saxony-Anhalt, part of the former “Iron Curtain”, has been declared a “National Natural Monument” since 2019. Its protection includes numerous archaeological sites from the GDR era that have survived due to restricted access and minimal agricultural or silvicultural land use. These remains comprise, e.g., observation tower foundations, patrol roads, boundary markers, cable routes, signal fences, cleared settlements, as well as artefacts from border personnel. In most cases, distinctions between archaeological and architectural monuments are blurred, forming an integrated heritage landscape. Information regarding the border fortifications dismantled from 1989 onwards, and the remains of earlier stages of construction preserved in the ground, can often only be obtained through archaeological means. Understanding these remains is crucial for studying the Germany division. Current research in Saxony-Anhalt systematically records and analyses both archaeological and architectural evidence of the GDR border regime through non-invasive survey methods, selective excavations, and long-term monitoring. This interdisciplinary approach connects archaeology with heritage preservation and regional history. Equally important is collaboration with contemporary witnesses who experienced the border, as their testimonies provide essential context for interpreting finds and features. Their accounts also highlight the enduring cultural memory and identity shaped by the GDR period.

09:00–10:40 Session 6a:
Coastal landscapes through the ages

CHAIRS: *Pière Leon Frederiks, Kira Raith, Svea Mahlstedt and Moritz Mennenga*
LOCATION: U5 / 01.22

09:00 *Soetkin Vervust, Zoë Vanbiervliet, Nathalie Pil, Marc De Bie, Víctor Cartelle, Ruth Plets, Tine Missiaen, Yağız Arda Çiçek, Christian Schwarz, Erik Toorman and Jaak Monbaliu*
Reconstructing Medieval Dike Building and its Impact on the Middle Flemish Coast (Testerep): An Integrated Archaeological and Modelling Approach

Dike construction profoundly reshaped the Flemish coastal landscape during the Middle Ages, transforming tidal marshlands into embanked and drained polders. While historical sources provide a broad outline of this process, the archaeological and geomorphological evidence for early embankments remains limited. Within the interdisciplinary TESTEREP project—investigating 5000 years of landscape evolution on the Belgian Middle Coast—we studied the medieval embankment history of the former island of Testerep, once located between the towns of Westende and Oostende and separated from the mainland by a wide tidal gully. By combining archival research, historical maps, electromagnetic induction (EMI) surveys and targeted excavations, we traced the layout and chronology of successive dike systems that progressively enclosed and finally dammed this gully. These results form the basis for exploring the wider landscape impact of medieval embankment. Using advanced hydro-morphodynamic models, we hindcast regional tidal circulation and sediment dynamics under various embankment scenarios to test how such large-scale human interventions may have influenced coastal evolution. This integrative approach demonstrates how the combination of archaeological, historical and geophysical data with numerical modelling can help trace the long-term legacies of medieval landscape transformation.

09:20 *Hanna Hadler, Dennis Wilken, Bente Majchczack, Ruth Blankenfeldt, Sarah Bäumler, Dirk Bienen-Scholt, Ulf Ickerodt, Stefanie Klooß, Antonia Reiß, Timo Willershäuser and Andreas Vött*
Times of Rise and Failure: recovering a drowned medieval landscape in the tidal flats of North Frisia, German Wadden Sea

Since 2015, an interdisciplinary group of researchers has investigated a cultural heritage preserved beneath recent tidal flat deposits in the Wadden Sea of North Frisia: a once cultivated medieval landscape drowned by “Grote Mandränke”, a major storm flood in 1362 AD. To gain new insight into the coastal landscape’s complex development, including medieval cultivation measures and the impact of major storm floods, we developed and constantly improve the so-called ‘type case’ approach - a methodological toolkit based on systematic geophysical prospection, geoarchaeological investigations and archaeological survey. For the two model areas Rungholt and Hooge, we found peat extraction for cultivation of fossil marshes and salt production to have lowered the ground surface, likely below mean high water of that time. At least in parts of North Frisia, medieval land use thus clearly increased the coastal vulnerability. From our present results, we consider these intense human-environment interactions as decisive triggers for the devastating effects of the 1362 AD “Grote Mandränke” storm surge and establishment of tidal flats that are nowadays part of the UNESCO World Heritage “Wadden Sea”. Research will continue in 2026 within the DFG-funded Research Unit FOR 5837 “Times of Rise and Failure (TORF)”.

09:40 *Pière Leon Frederiks*
An early medieval rampart in between moraine, marsh and sea – geoarchaeological studies on the North Frisian island of Föhr

North of the village Borgsum on the North Frisian island of Föhr lies the monumental Borgsumburg. The early medieval rampart was constructed on a moraine ridge surrounded by extensive marshes. Questions on the development and use of the marsh, the landscape context of the stronghold and it’s connection to the North Sea are in focus for the first time. Since summer 2021, the Lower Saxony Institute for Historical Coastal Research has conducted archaeological excavations as part of the research project ‘The Borgsumburg on the North Frisian island of Föhr’. Affiliated with the project, a PhD study investigating the landscape context of the monument was initiated in early 2022.

Due to the low erosion caused by the embankment protection and the only superficial agricultural usage, the preservation of features formed by geomorphological activities, especially for the marshes, is outstanding. Thus, the terrain offers valuable insights regarding past landscape development processes. By integrating methods such as geomagnetic surveys, sedimentological analysis, multispectral drone imagery and processing of LIDAR data, this research provides an in-depth understanding on navigable water systems, connectivity to the North Sea, natural harbour locations and potential sites for recovering building materials, which will be presented in the lecture.

10:00 *Moritz Mennenga*
The sunken prehistoric landscape of the Wanna region on the southern North Sea coast

Over thousands of years, the southern North Sea coast has undergone significant changes due to fluctuations in sea level and the expansion of wetlands. People also lived in this changing landscape during the late Mesolithic and early Neolithic periods. In the Wanna micro-region in the district of Cuxhaven, Lower Saxony, these processes have been studied in more detail since 2019. To this end, geoscientific drilling, geophysical measurements, moor stratigraphic investigations and archaeological prospecting have been carried out. These have made it possible to reconstruct local changes in sea level and the expansion of wetlands. At the same time, several Neolithic sites from this period were documented, making it possible to understand how changes in the landscape affected usable land and to gain an impression of how these changes might have affected people’s lives. This talk summarises the methodological approach and results of these investigations for the period between 6000 BC and 2000 BC..

09:00–10:40 Session 8a:
Exploring the Decolonization Discourse in Mountain Landscapes: Rethinking Margins, Methods, and Meaning-Making

CHAIRS: *Francesca Chelazzi, Kirsten Hopper, Stefania Fiori and Lisa Doro*
LOCATION: U5 / 01.17

09:00 *Francesca Chelazzi, Kristen Hopper, Stefania Fiori and Lisa Doro*
Introduction by session’s organisers

09:15 *Joos Melander*
A “poor, harsh and hardly penetrable territory”: Rethinking the “backwards mountaineers” of Aitolia, Greece between 1400 and 700 BCE

Thucydides describes the inhabitants of Aitolia as “running down from the hills […] darting their javelins” (3.97.3, transl. Crawley, 1910) and casts them in othering tropes when highlighting their war-like character, unintelligible dialect, and dubious culinary habits (3.94.4-5; Fragoulaki, 2023). It is my view that archaeology has largely reproduced this perception in a general discourse on ancient Greece as divided between “advanced, active and accessible regions, and the rest of the country” (Coldstream, 2003, p. 374, my italics) and specifically on Aitolia as indicated both in this paper’s title (Bommeljé & Doorn, 1987, p. 13) and by recurring narratives of tribes migrating out of the mountains (Moschos 2009, p. 250-253; Christakopoulou, 2016).

With this paper, I aim to answer calls for a more nuanced reframing and regionally varied understanding of the ancient Greek world (Mazarakis-Ainian et al., 2017; Whitley, 2017; Lemos & Kotsonas, 2020; Knodell, 2021; Rönnberg and Sossau, 2022). This will be attempted through reconceptualizing the mountainous landscape of Aitolia as holding epistemic potential for challenging colonially rooted narratives (Greenberg & Hamilakis 2022; Umachandran & Ward 2024) of human-nature relations and “cultural development” as it is usually presented (e.g. Gadolou & Paschalidis 2020).

09:22 *Jessica Keil*
Challenging the void – the Tyrolean Alps during the Bronze Age between perception and tradition

The Alps have long been perceived as a 'locus terribilis', a hostile and unattractive environment, a notion rooted in ancient texts by authors like Livy and Silius Italicus. This external perspective continues to influence modern interpretations, including the hypothesis that it was economic interest in copper ore deposits during the Bronze Age (c. 2200–800 BC) that led to permanent settlement in the (Eastern) Alps, particularly Tyrol. The apparent lack of Neolithic settlement evidence in Tyrol seems to confirm this view, with Bronze Age settlement patterns ostensibly supporting the narrative of successive colonisation with an initial focus on copper ore mining areas. However, anthropogenic indicators from pollen profiles across Tyrol suggest significant human presence already in the Neolithic period, challenging the idea of a settlement void. Additionally, an aoristic evaluation of Bronze Age sites – considering the entire archaeological record rather than focusing solely on settlements – questions the supposedly linear connection between mining/metallurgy and settlement development. These findings reveal how entrenched perceptions, archaeological record filters, and research biases have narrowed our understanding of Alpine landscapes. This study advocates stricter consideration of different (disciplinary) perspectives in the reconstruction of prehistoric land use and critically reflects on internalised conceptions of mountainous habitats.

09:29 *David González-Álvarez*
Using local ethnographic analogies of 'traditional pastoralism' in archaeology naturalises unhistorical views on mountainous landscapes: recent research in the Cantabrian Mountains (NW Iberia)

Our investigations in Babia (León, Spain) examine the complex long-term biographies of upland landscapes mediated by human activity. We should not oversimplify their nature as merely ‚marginal' or ‚remote', because global processes are clearly connected to this region. The project analyses material and intangible traits, integrating archaeological and paleoenvironmental datasets. Furthermore, ethnographic accounts are valuable sources for understanding the potential and limitations of developing activities like pastoralism. These sources actually describe livelihoods that should be historically contextualised in the Modern and Contemporary periods. Therefore, generalisations based on strict ethnographic analogies perpetuate ahistorical views on the landscape biographies of these mountains. The uncritical use of local ethnographic accounts burdens our archaeological imagination by focusing our attention on models that are not the only options for understanding ancient landscapes. Moreover, it strengthens internal colonialism, as current challenges faced by rural communities are overshadowed by nostalgia for 'traditional' rural livelihoods. Future rural development rarely involves radical changes to cultural, social or economic traits, due to the reluctance of public bodies and the strict preservation regulations of cultural and natural heritage. Landscape Archaeology can deconstruct some of these misconceptions, facilitating a more nuanced understanding of past, present, and future socio-environmental relations in mountainous landscapes.

09:36 **Charles Pauley and Ruben Davtyan**
Archaeological Knowledge, the Colonial Gaze, and the Making of Paradigms in Northern Armenia

The South Caucasus, shaped by a mountainous landscape, has long functioned as a strategic corridor of trade and cultural transmission, positioned at the intersection of north–south and west–east routes. Despite this centrality, the region has frequently occupied a political periphery within longue durée imperial systems, from the polities of Mitanni, Urartu, and Achaemenid empire. Archaeological research in the South Caucasus began in the nineteenth century under the Russian Empire and was initially conducted under imperial directives with an explicitly exploratory and extractivist orientation toward its peripheries. Early interpretations consequently framed archaeological material within hierarchical center–periphery paradigms, casting local cultures as passive recipients rather than active agents. Over time, however, both methodological approaches and interpretive paradigms have undergone significant transformation. In this contribution, we critically reassess the history of archaeological practice in northern Armenia—site of the country's earliest excavations—to trace this epistemic shift. We argue that research has moved from an colonial gaze toward frameworks that recognize the region as a dynamic locus of cultural exchange and political consolidation and try to demonstrate it can be reinterpreted as a generative hub within broader ancient networks.

09:00-10:40 Session 30a:
Manipulated and artificial bodies of water as archaeological landscape relics

CHAIRS: *Thomas Becker and Andreas Vött*
LOCATION: U5 / 02.17

09:00 *Thomas Becker and Andreas Vött*
Manipulated and artificial water bodies - an introduction

09:20 *Johannes Schmidt, Sophie Lindemann, Felicitas Geißler, Michael Hein, Niels Lohse, Julia Schmidt-Funke and Matthias Hardt*
Spatio-temporal dynamics of river channel patterns during the last 400 years south of Leipzig, Germany

The Elster-Pleiße floodplain south of Leipzig has undergone significant hydromorphological changes over the past few centuries, influenced by both natural processes and anthropogenic interventions. This study employs selected mapping of fluvial-geomorphological features based on a LiDAR DTM and old maps analyses to reconstruct past river dynamics and identify shifts in channel morphology. Geomorphological features, such as oxbows, ridge-and-swale point bar structures, crevasse splays and levees reveal an earlier, more dynamic floodplain characterized by meandering and anabranching channels, which transitioned into a system of stabilized, largely immobile watercourses. Comparative analyses of old maps spanning from the 16th to the 20th century indicate a gradual reduction in river sinuosity and lateral migration, coinciding with increasing human modifications such as mill races, timber rafting canals, and flood protection measures. Key transformations include the straightening of channels, floodplain aggradation, and the impact of open-cast lignite mining in recent centuries. The study highlights the complex interplay of sedimentary processes and anthropogenic activities in shaping the floodplain's evolution. This combined approach allows for a detailed examination of the relative chronology of changes and helps identify topographic legacies left by dynamic floodplain systems, enhancing our understanding of the evolution of these landscapes.

09:40 *Lia Vermot, Jean-François Berger, Charly Massa, Jacqueline Argant, Hervé Richard, Yannick Miras, Steve Pauble, Robert Royet and Elvyre Royet*
Ditches: a geoarchaeological record of high potential, the example of northern Isère department (France)

Palaeoenvironmental studies often focus on 'natural' wetlands, but other landscape's elements, whether natural or anthropic, constitute rich records for reconstructing environmental changes and land use, for example the rivers, or also ditches. These anthropogenic structures function as sediment traps recording their use, function, cleaning, and abandonment. They release extended sedimentary sequences in environments where the surrounding soils have sometimes been severely affected by erosion and recent agricultural practices. Their analysis using multidisciplinary and multi-proxy protocols provides information on a more local scale. At the territorial level, they can therefore complement regional information obtained from core sampling in 'natural' environments. Whether on a spatial or chronological scale, these different approaches are complementary and provide an understanding of how the territory functions and the possible forcings over time. The northern part of the Isère department has a large number of glacially induced wetlands which recorded environmental changes since the last glaciation. In several of them, ancient drainage networks have been observed through photo interpretation. Since the late 1990s, many geoarchaeological studies have examined some of these areas. Here is a synthesis of the methodology and results of the geoarchaeological studies conducted in this territory on drainage networks, rivers and wetlands.

10:00 *Jere Drpić*
Roman Water Management in NW Croatia: GIS-Based Archaeological Evidence

This paper presents new evidence for the interlinked systems of Roman land division and water management in north-western Croatia, focusing on the lowland area along the Sava River near Andautonia and the wider territories of cities of imperial significance such as Siscia, situated in a flood-prone region. Although Roman centuriation in this area has long been hypothesized, its spatial structure, extent, and hydraulic components have remained unverified due to the lack of systematic landscape analysis. Using GIS-based visualisation of Airborne Laser Scanning (ALS) data, a rectilinear grid corresponding to the standard Roman module of 710 × 710 m (20 × 20 actus) was identified. Linear depressions along centuriation boundaries are interpreted as drainage channels designed to reclaim the flood-prone terrain, illustrating how territorial organisation could simultaneously function as a hydraulic system. These channels are exceptionally well preserved, remain clearly visible in the landscape, and are partially integrated into modern road infrastructure and stream regulation systems that follow courses originally shaped in the Roman period. The results, forming part of the author's doctoral research, highlight how Roman infrastructural planning merged land division with water control, establishing a landscape framework that continues, perhaps unconsciously, to structure the present environment.

10:20 *Martin Offermann, Michael Hein, Erik Liebscher, Julia Schmidt-Funke, Lukas Werther and Christoph Zielhofer*
Integrating Local Dynamics and Basin-Wide Change: A Historical View on Atlantic Salmon in the Mulde River

Channel patterns and river connectivity are key controls on fluvial dynamics and eco-morphological habitats. They respond to climate and land-use change and shape habitat suitability through variations in width, flow velocity, and depositional regimes. Since medieval times, weirs and dams have altered both habitat potential and longitudinal connectivity. We conduct a multi-temporal analysis of river morphology, connectivity, and floodplain land use in the Mulde system, motivated by the local extinction of Atlantic salmon (Salmo salar) over the past two centuries and the limited success of reintroduction efforts. At the macro scale, we map historical barriers and channel changes using Saxon Meilenblätter (1780–1821) and Von Decker's Quadratmeilenblätter (1816–1821), and evaluate floodplain land use as a proxy for pollution. Initial results indicate a negative relationship between cumulative barrier counts and salmon presence, and between intensified floodplain land use and salmon presence, whereas sinuous and meandering reaches show higher probabilities of occurrence. To link macro- and micro-dynamics, we add two microhistorical case studies (Leisnig; Zwickauer Mulde) that reconstruct fisheries, hydraulic infrastructure, and maintenance regimes. Together, these microhistories ground basin-wide patterns in concrete practices, institutions, and conflicts, showing how connectivity loss emerged from cumulative local decisions.

09:00-10:40 Session 7a:
Landscapes of change: data, methods, interpretations

CHAIRS: *Ylenia Paciotti and Carlo Citter*
LOCATION: U5 / 00.24

09:00 *Sivanantham Ramalingam, Ramesh Masethung and Ajay Kumar Rammoorthy*
Sangam era landscape transformation: A case study of Keeladi

This paper analyzes the vertical transformation of Keeladi's urbanscape, tracing its industrial evolution through occupational layers spanning the early historical period (c. 600 BCE to 300 CE). Utilizing vertical profiling of 150 excavated trenches, corroborated by radiocarbon dating of 30 samples, diatom analysis and pollen studies, the research reconstructs three major phases of development over 800 years of habitation, demonstrating a deliberate remaking of space. The site stratigraphy reveals a sequence from a pre-structural phase to the emergence of elaborate weaving industries and their eventual abandonment. Archaeo-botanical evidence, presence of pollution tolerant diatoms from terracotta ring-wells indicates pollution from human activity, and on stratified deposits shows a shift to drought conditions suggesting the site was affected by prolonged drought leading to its abandonment around the early medieval period (c. 400 CE). These transformations are interpreted as adaptive responses to environmental changes, including fluvial shifts of the Vaigai River. By integrating stratigraphic, archaeo-botanical, and spatial data, this study demonstrates that Keeladi was not static but a continuously negotiated vertical landscape reconfiguration that housed one of peninsular India's earliest and most dynamic urban industries.

09:20 *Farnaz Faraji and Somayeh Fadaei Nezhad Bahramjerdi*
Landscape Characterisation in Non-European Context: How Have Settlement Patterns in the Maymand Cultural Landscape Affected Its Landscape?

Since its publication in 2000, the European Landscape Convention (ELC) has reshaped global approaches to landscape planning and heritage management. Key to this shift are concepts of landscape perception and methods such as Historic Landscape Characterisation (HLC) and Landscape Character Assessment (LCA), which have been widely applied in European and North American contexts to address contemporary landscape change. However, despite the prominence of the ELC in policy discussions, its potential remains underutilised in countries such as Iran. This research explores how evolving human settlement patterns have influenced landscape character in the Maymand Cultural Landscape. Using old and new maps and ethnographic studies, and spatial analysis in GIS, the study identifies key phases in Maymand's landscape transformation. The findings reveal four significant periods of change: the early nomadic settlement phase; the era of local monarchic governance; landscape restructuring influenced by Iran's White Revolution in the 1930s; and recent landscape degradation driven by population decline and inadequate land management following migration to nearby towns and the city of Kerman. Understanding these shifts highlights the importance of applying HLC and LCA in culturally diverse contexts to support informed and sustainable heritage landscape management.

09:40 *Dr. C. Thomas Shay and Liam Nendick*
The Mycenaean Collapse and its aftermath on the Argive Plain, Greece

One of the recurring causes of dramatic landscape change throughout history is the period of transformation surrounding the downfall of a major civilisation. With this in mind, our paper examines the Mycenaean collapse and Late Bronze to Early Iron Age transition in the Argive Plain (ca. 1200 to 1050 BCE), with a focus on how civilisational decline acts as a driver for major landscape change. We begin by analysing the key features of Mycenaean collapse, to establish how the physical, environmental, agricultural, and archaeological landscapes changed during the period. We then investigate the reasons behind such a change, exploring current hypotheses such as social and political upheaval, environmental and climate change, natural disasters, weaknesses in economy and trade, agricultural vulnerabilities, invasion, and other combined models. Finally, we draw upon archaeological evidence from key sites, alongside archaeobotanical, landscape, and environmental data to build a more comprehensive explanation for this dramatic period in Greek history. With this, we hope to better understand not only Mycenaean collapse itself, but its impact on the people of the Argive plain and how civilisational decline acts as a recurring source of major landscape change.

10:00 *Elie Essa Kas Hanna*
Realmese: Continuity and Transformation. New Evidence on the Sicilian Landscape between the Middle Ages and the Contemporary Era

The presentation introduces the case study and results of the archaeological excavation campaign conducted in the summer of 2025 at the Realmese Necropolis (Calascibetta, Sicily). Although the necropolis is historically known for its pre-classical evidences, recent investigations have focused on previously unknown layers and contexts spanning an exceptionally long period, up to the contemporary age. The results of the excavation have brought to light previously unknown archaeological evidence that clearly documents the complex dynamics of the transition from the Middle Ages to the contemporary age. The material evidence recorded clarifies how this transition was a continuous process, shaped by constant interaction between environmental factors (changes in the landscape) and human action (exploitation, reuse, abandonment of the area). This fact is of crucial importance in the context of the central Mediterranean, where the archaeological record of such prolonged and stratified historical processes tends to be fragmentary. The stratigraphic sequence of Realmese therefore offers a coherent and uninterrupted material chronology for understanding the socio-economic and territorial evolution of inland Sicily during a crucial historical period.

10:20 *Marcello Cabriolu and Durdica Bacciu*
The abandoned village of Caraidanu - preliminary investigations

The ruins of an agricultural site of Caraidanu, discovered on Mount Limbara in the municipality of Calangianus (SS), have been the subject of research. The area, from the 13th to the 16th century, was early contested among the Giudicati kingdoms and after became Catalan–Aragonese domain. The site lies about 500 meters from the scattered houses of Nulvara, near the medieval village centrally located respect to the «ecclesie Sancti Salvatoris loci de Narvara, Castrensis diocesis», already abandoned by the late 15th century, and is documented in a Pope document of 1548. By 1580, the settlement was already in ruins. Between 1633 and 1635, it was the subject of investigations aimed at launching a repopulation project—never realized—through the nearby village of Berchidda. Eventually, the surrounding ruins became a source of building material, as was common for rural churches and abandoned villages, contributing to the development of private agricultural dwellings typical of Gallura, known as stazzi. Some of the structures make it possible to study wall stratigraphy and building phases. The diachronic study of a portion of the ancient abandoned medieval village was conducted according to the multidisciplinary approach of landscape archaeology, which also included the stratigraphic survey of masonry.

09:00-10:40 Session 13a:
Dynamic adaptations on dynamic landforms: Multidisciplinary perspectives on Quaternary populations

CHAIRS: *Parth Chauhan and Prabhin Sukumaran*
LOCATION: U5 / 01.18

09:00 *Jose Rapheal, Pratik Pandey, Satyam Bharti and Manish Rai*
Landscape Dynamics and Technological Evolution at Paisra: A Multi-Scalar Approach to Acheulian Human-Environment Interaction in the Kharagpur Hills, Bihar, India

Acheulian site of Paisra, located within the Kharagpur hills, Bihar, India, provides crucial insights into prehistoric human-environment interactions and technological evolution. Spanning over 2 sq.km, the site is characterised by aeolian-alluvium deposits that preserve a diverse array of stone tools, from Early Acheulean to Microlithic cultures, offering a rich record of technological adaptation across the Quaternary period. Excavations by the Department of AIHC & Archaeology, Banaras Hindu University, in 1980s revealed a landscape shaped by both aeolian and fluvial geomorphic processes, illustrating how hominin groups responded to shifting resource landscapes and environmental constraints. The site's sedimentary and archaeological records suggest that hominin groups adapted to ecological pressures through shifts in mobility patterns, resource exploitation, and technological innovation. The diversity of tool assemblages, including Large Flake Acheulian, continues till Microlithic, offering a response to environmental challenges. Environmental reconstruction by sedimentary analysis provides insights into past climates and their potential influence on human behaviour. GIS and remote sensing technologies further highlight patterns of artifact distribution and land modification, revealing trends in hominin settlement and mobility. Study contributes to landscape archaeology, exploring how prehistoric societies adapted to their environments, fostering interdisciplinary dialogue, examining population resilience, behavioural flexibility, and ecological adaptation from varying perspectives.

09:20 *Parth Chauhan, Ketika Garg, Prabhin Sukumaran, Vaneshree Vidyarthi, Aman Saini, Yezad Pardiwalla, Martina Nazary, Shashi Mehra and Vivek Singh*
Continuities and disparities in the Paleolithic landscapes of the Indian Subcontinent

South Asia being in the center of the Old World highlights its potential as a biogeographic corridor for hominin dispersals across Eurasia. The region is long-known for preserving diagnostic Paleolithic techno-cultures, with the exception of the Oldowan which remains chronologically elusive. This paper discusses geographic, ecological, technological, and contextual patterns from the known Lower, Middle and Upper Paleolithic records across the Indian Subcontinent. Using GIS and network analyses, over 2000 Paleolithic sites were mapped and spatially analysed. Their distribution shows major geographic gaps in the following zones of India: central-peninsular, eastern, northeastern and south-western India where very few sites have been reported. This is presumably due to absence of quality/knappable raw materials, research bias, preservation bias, logistical challenges and select zones being inaccessible due to decades of socio-political unrest. Additional anomalies include the absence or low profile of typo-technological absence of the Lower Paleolithic in Sri Lanka and southern India, Early Acheulean in Gujarat, Late Acheulean in Maharashtra as well as the uneven distribution of classic Levallois and exclusively Upper Palaeolithic (i.e. large-laminar-based) technologies. The paper also attempts to broadly outline 'degrees' of Paleolithic transitions at a regional level based on the density of site types and associated adaptive features.

09:40 *Alžběta Danielisová, Maria Pia Maiorano and Tara Beuzen-Waller*
Habitability, Mobility, and Burial: Evidence for Dual Neolithic Strategies in Southeast Arabia

The Holocene period in Arabia was marked by dramatic climatic and hydrological shifts that transformed previously arid zones into habitable environments during the Holocene Humid Period (HHP), ca. 10500 - 5500 BP. While archaeological evidence across the Arabian Peninsula attests to herding, foraging, and complex mortuary practices, the lifeways and environment interactions of these communities remain poorly understood, particularly where contemporaneous settlements are lacking. This paper presents a case study of inland–coastal dynamics of Neolithic southeast Arabia in the 5th millennium BC. Multi-isotopic evidence of a local burial community in a shared collective grave attests to complex lifeways integrating marine exploitation with inland occupation and a potential high degree of mobility with an apparent North-South gradient, thus challenging simplistic models of inland versus coastal adaptations. Our ongoing research aims to investigate the settlement strategies and mobility patterns of these groups through geomorphological survey, lithic analysis, and isotopic evidence, advancing our understanding of Neolithic adaptability in the HHP Arabia.

10:00 *Joel Roskin*
Paleoenvironmental and prehistoric implications of dune-damming in the arid northwestern Negev dunefield since the Last Glacial Maximum

Aeolian-Fluvial interactions, in particular, the dune-damming of drainage systems, influence dunefield evolution, deliver unique morphologies, sedimentologies and stratigraphies, and generate waterbodies. When initially devoid of water, the moist fine-grained water-body bottoms bloom into grasslands. When dry for extensive time, these sediments turn into dust emission hotspots. Since the Last Glacial Maximum and mainly during the Terminal Pleistocene, along the margins of the eastern edge of the Sinai-Negev erg - the arid NW Negev dunefield (Israel), encroaching vegetated linear dunes formed dune-dams and led to spatial-temporal sequences of shallow, multi-annual to seasonal water bodies. The fringes of these water bodies are dotted with abundant open-air lithic concentrations of recurring and changing, seasonal campsites, mainly of Epipalaeolithic times. I review 4+ decades of integrated archaeological and geomorphic research on the impact of dune encroachment and consequent dune-damming upon Epipalaeolithic to Chalcolithic mobilization, occupation, and cultural development in the southern Levant.

09:00–10:40 Session 22A:
Geoarchaeology in Vertical Landscapes – Methods, Potentials, and Emerging Questions

CHAIRS: *Kerstin Kowarik and Valentina Laaha*
LOCATION: U5 / 02.22

09:00 *Kerstin Kowarik and Valentina Laaha*
Introduction

09:20 *Arshavir Hovhannisyan, Varduhi Siradeghyan, Alessandra Gilibert, Arsen Bobokhyan and Pavol Hnila*
Archaeogeochemistry at a high-mountain site of Tirinkatar, Armenia: comparative prospection of archaeological and modern pastoralist contexts

The site of Tirinkatar (2850m asl) on Mount Aragats is a large alpine meadow with springs, streams, and small ponds. Its archaeological features include ritual contexts with monumental sculpted stelae, tombs, and campsites, spanning more than eight millennia from the 6th millennium BCE to the present. We conducted geochemical prospection of selected archaeological contexts using soil sampling (depth 15-20 cm) along variable grids, followed by semi-quantitative spectral analysis focused on metals and phosphorus. The results are promising, especially for funerary contexts, where clear metal anomalies were detected at the surface. Phosphorus anomalies were even more pronounced—two to twenty times above background levels—but their interpretation proved challenging, as they could reflect bones, ashes, dung, or other modern human activities. To aid interpretation, we additionally conducted extensive comparative sampling of recent ethnographic features at the site (ash heaps, abandoned animal pens and former tent campsites). The highest phosphorus concentrations occurred at ash heaps and some suspected burials, whereas no anomalies were found in animal pens and campsites. In the only case where excavation was carried out beneath a phosphorus anomaly, a pile of calcined prehistoric bones was discovered.

09:40 *Guido Stefano Mariani, Emanuele Pintaldi, Michele Freppaz, Michele D'Amico, Matteo Garbarino, Flavio Ruffinatto, Alma Piermattei, Alan Crivellaro, Francesco Maimone, Samuele Voyron, Walter Finsinger, Ambra Idone, Natascia Druscovic and Gabriele Sartorio*
Geological landscape and soil diversity as proxies for land-use change in marginal communities of the Western Italian Alps

In landscapes as complex as mountain ranges, "marginal" territories where human activity is limited represent a primary source of information for the reconstruction of environmental change and human-landscape interactions, especially in areas as densely populated as the Alps where human impact is often too widespread. Within the marginal area of the San Grato Valley (Aosta Valley, NW Italy) ongoing human presence started at the arrival of German-speaking Walser populations in the 13th-14th Century, up until today. Within the framework of the Interreg ALCOTRA (Italy–France) project "DAHU", we applied a multiscale approach integrating geoarchaeological proxies with evidence from archaeology, forest ecology, archaeology, history, paleoecology, dendrochronology, and wood anatomy, to provide insights on the interplay between Walser communities and landscape factors since the Middle Ages. Preliminary data show how topography and geomorphological processes, especially past glacial and slope dynamics, strongly dictate the extent of land use and settlement distribution in time. Soils also documented the human imprint on the landscape, recording both climatic oscillations and land-use changes. Human activity in the San Grato Valley likely began well before the arrival of the Walser people, opening new perspectives on the timing and extent of human presence in these high mountain valleys.

10:00 *Valentina Pescini, Marco Bodon, Roberta Cevasco, Charlotte Diffey, Natalia Egüez, Bruna Ilde Menozzi, Moreno Diego, Sarah Parrilla and Ivano Rellini*
Extra-site deposits as soil archives for mountain landscape reconstruction: interdisciplinary perspectives from Monte Mongioie (SW Alps, Italy)

Extra-site deposits are valuable archaeological and environmental archives that provide key evidence for reconstructing past environmental dynamics and agro-sylvo-pastoral practices. However, their study is particularly challenging, as pedoturbation processes (e.g. soil mixing due to bioturbation, physical alteration of bio-archaeological remains etc.) can affect the integrity and representativeness of the archaeological record. A multi-proxy, regressive, and high-resolution analytical approach is therefore essential to mitigate these risks. This study presents the results of an interdisciplinary investigation conducted in the south-western Alps (Italy), on the southern slope of Monte Mongioie. The research integrates geo-archaeological and bio-archaeological data (pedoanthracology, palynology, malacology, biomolecular analyses, soil micromorphology, geochemistry, and radiocarbon dating) with documentary sources such as historical texts and maps. The integrated analysis revealed a well-preserved Roman to Medieval paleosol with high organic content, rapidly buried by a Late Medieval colluvial event that sealed the underlying features. The analysed assemblages document persistent open grassland landscapes from the Roman period onward, maintained through sheep/goat grazing, temporary cultivation, and controlled fire use for vegetation management within a commons regime system. Progressive woodland encroachment from the 19th-20th centuries reflects the gradual abandonment of historical agro-sylvo-pastoral practices.

10:20 *Julia Schönicke, Moritz Nykamp, Philipp Hoelzmann and Rouven Turck*
Reconstructing Alpine Mining Landscapes: Sediment Analyses from Trient, Les Tseppes (Switzerland)

In Trient, Les Tseppes, in western Valais (Switzerland), systematic prospecting and exploration have been taking place since 2020 in an early medieval to modern iron ore mining area. In this talk, the sampling strategy of the project – aimed at conducting an exemplary microarchaeological investigation of an Alpine iron ore mining and smelting site – will be discussed. We demonstrate how different activities such as production, waste disposal, and domestic everyday practices are reflected in the archaeological sediment records of ovens, slag heaps, and buildings, in comparison with off-site deposits. These patterns are identified, among others, through granulometry, carbon characterization and quantification, and multi-element analyses using ICP-OES and pED-XRF. Several geoarchaeological methods were introduced: the combination of geomagnetic survey, coring, targeted excavations, and sediment analyses allowed for a thorough examination of the site using a minimally invasive workflow. The presented multi-proxy approach is of particular relevance in ecologically fragile high-mountain environments. The workflow developed in this project is intended to be applied to other Alpine sites in the future to enable regional and supra-regional comparisons of past metallurgical economies. In addition, the investigations will contribute to reconstructing the former functions and patterns of use of abandoned Alpine dwellings (Wüstungen).

09:00–17:30 Session 1l:
Poster session Day 1

LOCATION: KR12 / 00.16

Johannes Schmidt, Michael Hein, Birgit Schneider, Lehmann Tabitha, Djamil Al-Halbouni, Thomas Günther, Noah Roïgk, Brigitte Urban, Sophie Lindemann, Niels Lohse, Julia Schmidt-Funke, Matthias Hardt, Tony Reimann and Christian Tinapp
From Pristine Water to Urban Channel: A Sedimentary Stratigraphy Study of the Parthe River Evolution in Leipzig, Germany

The project "Leipzig, City in a State of Flux" examines the development of Leipzig's fluvial anthroposphere, focusing on the interaction between natural processes and human activities during the medieval and pre-modern periods. Floodplain sediments and soils serve as key archives for reconstructing these transformations. This study presents preliminary findings from the Parthe River, the smallest of Leipzig's rivers. A drilling transect combined with electrical resistivity tomography (ERT) provides insights into the hydrological and sedimentary evolution of the late Holocene floodplain. Stratigraphic evidence reveals a transition from Late Quaternary sandy–gravelly channel deposits to early Holocene organic sediments, followed by two distinct phases of overbank deposition: the first during the Bronze to Iron Age, and the second beginning in the High to Late Middle Ages. Organic muds from the Early Middle Ages indicate a period of low land-use intensity. The sequence reflects the shift from natural fluvial landscapes to increasingly modified urban waterways. This multi-methodological approach—integrating geophysics, sedimentology, geochronology, historical sources, and geoarchaeology—traces the long-term evolution of the Parthe River and enhances understanding of the emergence of Leipzig's fluvial anthroposphere.

Margarita Zalinian
Tracing Human–Environmental Relationships Through Buried Soils: Insights from Geoarchaeological Records in N Poland

This study investigates human-environment interactions and land-use practices in northern Poland, focusing on a dark soil profile and associated slope deposits at the Ostrowite Archaeological Complex. The research spans from the Early Iron Age (8th–7th centuries BC), when the area was settled by Early Pomeranian communities (Wielka Wieś Phase), through the Early Middle Ages and into the Early Modern period. A multidisciplinary approach—including geochronology, geochemistry, sedimentology, palaeobotany, soil micromorphology, and molecular markers—was applied to reconstruct natural and anthropogenic influences on soil formation and landscape evolution. Results indicate a long-term transition from naturally formed to human-modified soils and slope deposits, reflecting mixed agricultural and livestock practices. Multi-proxy evidence documents shifting cultivation, cereal (millet and wheat) farming, livestock husbandry (cattle, sheep, and goats), manuring, fallow rotations, and selective forest clearance, alongside pasture management. Climatic variability influenced settlement patterns and soil dynamics, with milder periods favoring agricultural expansion and cooler, wetter phases increasing soil erosion, sediment redistribution, and colluvial deposition. Overall, the study demonstrates the value of buried soils and slope deposits for reconstructing past economic strategies and the interplay of human activity and climate in shaping northern Poland's landscapes.

Ranaivosoa Voajanahary and Rajoelimanana Andraina Fanantenana
A dynamic refuge: integrated palynological and geoarchaeological perspectives on Quaternary adaptation in Madagascar

Madagascar's Quaternary record provides a unique window into how climatic oscillations shaped landscapes and influenced human and faunal adaptation within a global biodiversity hotspot. This study integrates palynological, diatom, and sedimentary evidence from inland subfossil sites to reconstruct Late Quaternary paleoenvironmental dynamics. By combining paleoecological and geoarchaeological data, it produces a high-resolution view of hydroclimatic variability and vegetation change, revealing how geomorphic processes affected resource distribution and habitat connectivity. The results highlight that population resilience depended on the capacity to adapt to a constantly shifting mosaic of ecological niches. Beyond its regional significance, this research contributes valuable empirical data to global models of hominin dispersal and adaptation to climate-driven landscape transformations, emphasizing the importance of interdisciplinary Earth Science approaches for understanding past environmental change and its implications for human-environment interactions.

Przemysław Mroczek, Marta Połtowicz-Bobak, Dariusz Bobak, Karol Standzikowski, Jarosław Wilczyński, Jacek Skurzyński and Maria Łanczont
Landscape instability and abrupt climatic shifts at the Epigravettian site Dzbańce 21 (SW Poland)

Abrupt climatic oscillations during the Late Pleistocene repeatedly disrupted the stability of upland loess landscapes in Central Europe, producing alternating phases of aeolian sedimentation, soil formation, erosion, and renewed human presence. A representative example is provided by the site of Dzbańce 21, located on the Głubczyce Plateau at the northern foreland of the Moravian Gate (SW Poland), where a thin loess mantle is completely transformed into a multi-phase loess-derived soil of polygenetic origin. Stratigraphic and luminescence data indicate at least two major interglacial and interstadial soil-forming episodes (MIS 5 and MIS 3), followed by rapid periglacial degradation and surface truncation during cold stages (MIS 4 and MIS 2). These alternating processes created a complex sequence recording cyclic landscape renewal, episodic aeolian input, and ecological stress. In its upper part, an Epigravettian occupation horizon containing lithic artefacts and reindeer remains reflects a brief human presence during renewed post-LGM instability. This record demonstrates how abrupt climatic forcing during the Weichselian Glaciation triggered short-term but transformative geomorphic and ecological responses, directly shaping resource availability and settlement patterns in periglacial uplands. Such archives highlight the dynamic feedbacks between environmental unpredictability and human adaptation in Central Europe during the final stages of the Weichselian.

Simon Maddison
The Coastal Hillforts of Ireland

Ireland is remarkable for the number and concentration of Hillforts along its coast. Using the data from the 'Atlas of Hillforts', some 282 of a total of 508 sites are situated directly on a coastal promontory. Indeed, in some specific stretches, they are so dense as to be located within 1km of each other. The coast of Ireland is well endowed with rich fishing grounds for a variety of species, and it seems likely that this was also the case in prehistory. The author has compared the coastal hillfort distribution with modern fishing data. The colocation of hillforts with marine resources seems likely to be deliberate, such as those on the coast of County Waterford, and the forts on Inishmore on the Aran Islands which are close to very productive fishing grounds further out in Galway Bay. Those further north could have also been exploiting Basking Shark. The author argues that is highly probably that the clusters of promontory hillforts around the south, southwest, west and northwest of Ireland were specifically built to exploit and control the abundant marine resources that were readily accessible to them.

Florian Ahrend, Ines Bruns, Friederike Bungenstock and Martina Karle
The Holocene coastal landscape of northwest Germany: storm deposits in sedimentological archives

Since the beginning of the Holocene, the rising sea level has driven a general progradational shift of the northwest German coastline. Alongside this long-term process, storm surges repeatedly reshaped the paleo-coast and influenced the environments where humans lived and adapted to changing conditions. In contrast to today's highly engineered coastline, the prehistoric shore was undiked and characterised by a gradual transition between land and sea rather than a sharply defined boundary. Consequently, storm surges likely affected both the landscape and humans in markedly different ways.

To better understand these dynamics, we focus on centimetre-thick clastic layers known as "Klappklei", found within Holocene peat horizons. These layers form during extreme high-water events and therefore serve as valuable indicators of past storm surges. Although "Klappklei" deposits have been recognised along the northwest German coast, they have not yet been systematically examined.

We present a reconstruction of the spatial distribution of "Klappklei" across the northwest German coast as well as a local paleo-landscape study on the East Frisian coast. The findings are based on borehole archive data, updated sea-level reconstructions, and new sediment core analyses.

Fahad Bagdadi and Matylda Brecz
The First Comprehensive and Systematic Survey of a Prehistoric Holocene Coastal Landscape in Northwest Arabia: The Wadi Al-Hamdh Coastal Plain

Marine artifacts – such as worked shell beads – and ecofacts – such shell and coral material – are found in ritual, domestic, and funerary Neolithic and Bronze Age contexts in Northwest Arabia. This is most notable in Al-Ula and Khaybar, Saudi Arabia, which have, over the past 7 years, been an enlightening and productive focus of archaeological research that's pushed our understanding of Arabian prehistory. As of yet, however, no published work has investigated prehistoric Holocene coastal landuse and occupation, let alone connections to the coast from these better researched in-land areas. We have identified definite prehistoric monumental structures in a 50 km^2 coastal plain West of AlUla, along what we further the argument is the major 'pathway' between the coast and the AlUla region, a major seasonal watercourse, Wadi Al-Hamdh. We present the results of our comprehensive systematic remote sensing survey, our methodology, our preliminary analysis, and the next steps in our research.

Antonia Umlauf, Abdelaziz El Khayari, Moritz Nykamp, Jens Jouaux, Mira Hafiz, Merlin Dittmar, Dirk Blaschtaand Wiebke Bebermeier
Holocene evolution of a coastal paleo-landscape near the pre-Roman necropolis Aïn Dalia Kebira (Tangier, NW Morocco) – first results

Holocene sea-level rise triggered changes in coastal environments along the Atlantic shorelines of the Iberian Peninsula and Morocco, challenging human societies to adapt to these changes. This also affected Phoenician settlements, which had been established in this area since the early third millennium BCE. The pre-Roman necropolis of Aïn Dalia Kebira is located south of Tangier, dates to the late 8th to early 5th century BCE, and contains a large number of Phoenician-Punic finds. The site is situated on a slightly elevated talus slope next to the wide floodplain of the Wadi Mharhar, ca. 17 km inland of the current Atlantic shoreline. Previously analyzed sediment cores from the lower Tahaddart estuary suggest a bay that extended far inland at c. 6.8 ka cal BP. However, it is unclear whether that bay reached the hinterland of the necropolis and when it silted-up due to delta progradation of the Wadi Mharhar. This study presents new radiocarbon-dated sediment cores from the vicinity of Aïn Dalia Kebira and the lower reaches of the Wadi Mharhar. Geochemical compositions were measured by XRF and evaluated using multivariate statistics to reconstruct local Holocene paleoenvironments, assess timing of floodplain aggradation and marine influence in the study area.

Andrzej Piotrowski, Paweł Sydor, Marek Kowalewski, Piotr Oliński and Tomasz Wolski
Geological conditions of the storm of 1497

The aim of the study is to present work on the geological reconnaissance of the storm from year 1497 that caused great havoc on the Southern Baltic coast. The storm altered the topography and left its mark on the geological profiles of the central coast of Southern Baltic Sea. The surge reached considerable heights. The force of the wind caused windbreaks across vast areas of Mecklenburg, Pomerania, and Masuria. According to the existed literature, the largest storms with catastrophic consequences approached in the autumn and winter seasons from the northwest. Storm from the year 1497 is among the largest in the Baltic Sea region. Therefore, identifying this undoubtedly climatic phenomenon based on geological data and chronicle records is a major challenge. The study area covers the Southern Baltic Sea coast from the Bay of Mecklenburg to Gulf of Gdańsk. It seems, however, that particularly favorable conditions for water accumulation occurred in the area of the Koszalin Bay due to the coastline shape and the topography of the coast.

Joel Roskin, Lotem Robins, Ruben Sanchez, Adam Ostrowski, Revital Bookman and Itamar Taxel
From Iran to Iberia: character, evolution and sand-soil enrichment of sunken groundwater-harvesting agro-ecosystems in aeolian sand since Early Islamic times until today

By studying earthworks of traditional, sunken, groundwater-harvesting agroecosystems)SGHAS) in coastal and inland aeolian sand in Iran, Egypt, Gaza Strip, Algeria, and Iberia, we analyze the function, and crop-type of recently excavated Early Islamic (EI)- to early Crusader-period Plot-and-Berm (P&B) agroecosystems situated along the Mediterranean coast of Israel. The SGHAS and the EI P&B agroecosystems, affiliated with nearby towns, enriched the sandy substrate with local organic material and urban refuse. The long-term investment in SGHASs earthworks proved profitable due to water security in the form of continuous shallow groundwater availability coupled with rainfall and groundwater replenishment via the shallow sand. The spotty historic appearance of SGHAS since the 15-16th centuries temporally lags after the abandonment of the EI agroecosystems and does not support connectivity of knowledge with regard. The 15-16th century convergence exemplifies the appearance of local ingenuities derived from growing agricultural and technological knowledge and experience, crop variety and pressing needs for food security. SGHAS crops are a range of vegetables, watermelons, date palms, and grapes, possibly implying that EI P&B crops were different. This study demonstrates the importance of traditional analogues for interpreting archaeological research gaps of archaeo-agricultural landscapes and provides starting points for reestablishing sustainable agriculture.

Angelika Abderhalden-Raba, Philippe Della Casa, Katja Kothieringer, Karsten Lambers, Bertil Maechtle, Mario Ranzinger, Thomas Reitmaier and Astrid Röpke
(Poster) Maiensäss settlements as connecting elements of vertical land-use (Lower Engadine, Switzerland)

Alpine summer farms (Maiensässe) are a key element of the high-mountain cultural landscapes of Switzerland and Austria, reflecting a long-standing tradition of alpine farming. Historically, they formed part of a vertical agricultural system and typically comprised one dwelling, a stable, and adjacent areas used for fodder storage, temporary housing, and intermediate pastures. In our study area above the modern settlement of Ramosch, Maiensäss sites occupy the zone between pronounced ancient terraces and alpine pastures above. Apart from our terrace research project, our current work focuses on the Maiensäss area of Chant Sura, Buorcha and Chant Dadaint at around 1800 m a.s.l. within the subalpine ecotone with partly decayed, partly restored ruins, which creates a unique setting for interdisciplinary study. Our excavations at Chant Dadaint uncovered phases of earlier wooden and stone buildings with several fireplaces. Radiocarbon dates place them in the Roman period - a remarkable result, as Maiensäss farming has previously been linked primarily to the late Medieval period. Additional radiocarbon dates from nearby sites corroborate evidence of human (transhumant) activity during Roman times. This leaves room for a follow-up project on the unexpectedly deep temporal dimension as well as building techniques and interior fittings.

Laszlo Ferenczi
Landscape archaeological and hydrographical characterisation of historic mill sites based on GIS analysis of river catchments in Czechia

Most of our knowledge on historic mill sites come from historical-topographical and landscape archaeological analysis, and much rarely from excavations. DEM modelling and data integration from different spatial digital databases (archaeological, historical, geological etc.), however, provide an opportunity of multidisciplinary and comparative analysis of big data – including various terrain parameters –, that leads to more in-depth understanding of the site selection and historic development. Illustrating these points in the context of research in Central Eastern Europe, the paper draws on recent case studies and regional studies, including the Střela catchment in western Bohemia or the basin of the Moravice River in the Sudetenland, then, also analyses a large dataset covering the whole of Czechia. It uses geospatial analysis to characterise site location, identify geographical constrains and historical trajectories and discontinuities in site selection (the latter being potentially of archaeological interest). The observations also highlight the relevance of studying historical mill sites on large scale also from the point of view of tracking their legacy impacts in soil archives and connecting spatial patterns to flood risk mitigation.

Rubén de la Fuente-Seoane, Leopoldo Pena, Ester García-Solsona, Ermengol Gassiot-Ballbé and Ariadna Nieto-Espinet
Tracing herds through mountains: building and benchmarking a bioavailable strontium isoscape for the western Catalan Pyrenees (NE Iberia)

Mountain landscapes are dynamic socio-ecological systems where pastoral strategies, geology and ecology interact at multiple scales. Within the RePiCa project (Re-thinking Pyrenean Cattle Management in the Context of Climate Change), we present the first bioavailable 87Sr/86Sr isoscape for the western Catalan Pyrenees, designed to support livestock mobility studies and palaeomobility research. Sixty-one vegetation samples were collected across thirteen geological formations in the Pallars Sobirà, Alt Urgell and Pallars Jussà regions, covering major lithological and altitudinal gradients. High-precision MC-ICPMS analyses yield values ranging from 0.7078 to 0.7202 (median ≈0.7139), revealing strong local variability and multimodal distributions that mirror the complex lithological mosaic of the area. We propose to model this baseline using Random-Forest regression and to cross-validate it against continental and Iberian-scale isoscapes (e.g., Bataille & Bowen, 2012; Díaz-del-Río et al., 2022; Hoogewerff et al., 2019; Holt et al., 2021), in order to evaluate potential improvements in spatial resolution and predictive accuracy for mountain contexts. We also discuss methodological aspects of scale, uncertainty and FAIR-data publication, and outline future integration with enamel 87Sr/86Sr and δ18O analyses from caprine and bovine remains to reconstruct seasonal herding and landscape connectivity through time.

Andrea Ricci, Daniele Moscone and Stefania Fiori
Walking on the Altinova Plain (Eastern Türkiye): Re-visiting Whallon's Survey through Historical Satellite Imagery

This paper revisits the archaeological landscape of the Altinova Plain, an area now largely submerged beneath the Keban Dam reservoir in eastern Türkiye. Through the lens of historical satellite imagery, this study provides a visual and spatial record of the valley before inundation, allowing renewed analysis of the sites identified during Whallon's 1967 survey across approximately 323 square kilometres. This remote-sensing approach provides complementary perspectives on settlement patterns and environmental contexts, enabling new insights into the region's archaeological signature. The study also evaluates the current condition and visibility of surveyed sites, distinguishing those destroyed or submerged from those surviving along the reservoir margins or outside its limits.
By integrating legacy survey data with declassified imagery, the work demonstrates how datasets once considered lost can be partially recovered to reconstruct drowned cultural landscapes. It further highlights the profound impact of large-scale water-related infrastructural projects on archaeological visibility and heritage preservation.

Viviane Diederich
(Poster) Experiencing Borders. Participation and historical political awareness through public archaeology at the German-Czech border

Cultural heritage is vital for society, contributing to collective identity and historic awareness. Research on border landscapes depicts how political and territorial aspirations impact cultural memory and identity formation. The proposed contribution highlights the relevance of participation in archaeological preservation in the Bärnau-Tachov region along the German-Czech border. The sites illustrate how evolving border situations impacted lives between Bavaria and Bohemia. The "Golden Road" fostered cultural connections between Nuremberg and Prague since the 14th century, but the same border interrupted the tradition as the Iron Curtain. Cross-border public archaeology, a project by the universities of Bamberg and Pilsen, stimulates dialogue and raises awareness of cultural heritage by engaging citizens in excavations of a medieval urban estate in Bavaria and a village abandoned after 1945 in Bohemia revealing that border politics not only had diplomatic consequences. Given the increasingly nationalistic political endeavors currently being observed in Europe, critical public archaeology can contribute to multidimensional reflection.

Susan Curran
Tara by Name, Tara by Nature? Exploring archaeological connections between Ireland's temair places

The Hill of Tara, Co. Meath, seat of kings and high kings, scene of myth and legend, holds a symbolic and significant place in Irish archaeological discourse. As one of the best-known archaeological complexes in Ireland, it has been viewed through an interdisciplinary prism of landscape studies that includes archaeology, folklore, language, and environmental science. But is it the only one? Clues to the existence of multiple 'Taras' are found within historical literary and documentary sources, also surviving in placenames across the island of Ireland. Some of these sites can be located within the landscape, often with associated archaeological remains, whereas others remain more elusive. This paper presents the findings of an ongoing project (funded by the Research Ireland COALESCE Scheme 2024) exploring the connections between these diverse 'Tara' places. Through systematic appraisal of the archaeological significance, monumental arrangement, and artefactual associations of those other places, this project incorporates a public archaeological approach with the objective of introducing the stories and experiences of those living within each 'Tara' place. The acquisition of new data and the re-use of extant information including remote sensing will shed new light on the origins, functions, definition of space, and potential inter-relationships of these places.

Michal Preusz, Milan Řezáč, Petr Kausek and Milan Metlička
Routes to the Unreachable Province of Boiohemum: Contacts Between Raetia and Bohemia During the Roman and Migration Periods

This paper explores the dynamic borderland between the Roman province of Raetia and the territory of present-day Bohemia (Boiohaemum) during the Imperial and Migration periods. While Roman presence is well documented in neighboring Pannonia and Noricum, the western connections across the Upper Palatinate and Bohemian Forest remain less understood. Through archaeological and topographical analyses, we reconstruct possible west–east communication routes and their continuity with pre-Roman (Celtic) networks, identifying mountain passes that facilitated both contact and exchange.

Material evidence — notably Roman coins and brooches — indicates sustained interaction across this frontier, despite the absence of permanent Roman military installations north of the Danube. Particular attention is given to the Domažlice Pass as a key corridor linking Augusta Vindelicum (Augsburg) and Castra Regina (Regensburg) with central Bohemia near the confluence of the Vltava and Elbe rivers.

By examining these cross-border routes as elements of a changing landscape of contact and perception, the paper contributes to broader discussions on bordering processes and the socio-political significance of frontier landscapes in Central Europe.

Rita Solazzo and Vivien Mathé
Methodological work on the use of electrical resistivity tomography for the study of Neolithic burial mounds.

The work presented here consists of an analysis of the acquisition and processing chain for apparent electrical resistivity data obtained during the construction of electrical panels on burial mounds. The objective is to identify the origin of surprising anomalies in certain resistivity models obtained after inversion with RES2DINV software (Geotomo Software). These anomalies appear at the base of the sections and do not appear to correspond to either an archaeological or a geological source. The tests were conducted on Neolithic burial mounds in southwestern France: Tumulus C in Bougon, Petit Dognon in Tusson, and Motte de la Garde in Luxé. The results show that the various electrode configurations used to acquire the data cannot explain these anomalies. Similarly, the various processing methods used to account for the topography of the sites do not appear to be the cause of these anomalies. On the other hand, it was found that the most realistic results were obtained for a residual error of the data inversion close to 3%. Below this, the calculated models certainly provide lower errors, but the proposed solutions do not seem realistic from an archaeological or geological point of view.

11:10-12:30 Session 3B:
Side effects from the construction of large linear infrastructure projects in Europe – chances for new insights on our landscapes

CHAIRS: *Florian Hirsch and Holger Schweitzer*
LOCATION: U5 / 02.18

11:10 *Toke Hansen*
From Rescue to Resource: Interpreting Slivers of Archaeological Data in Marginal Areas

In 2022–2023, extensive railway renovations in Eastern Denmark triggered large-scale archaeological surveys through test trenches and excavations along the tracks. While the route intersects one of Denmark's most renowned archaeological sites, the Himlingøje Necropolis—known for its rich Roman imports—most sections traverse marginal landscapes with little modern development and virtually no prior archaeological record. These areas were surveyed for the first time during this project, revealing previously unknown sites and activities. The linear nature of the work, confined to a narrow corridor sometimes only 10 meters wide, offers a fragmented perspective: an arbitrary slice through past landscapes. This raises a fundamental question: what do we do with such partial knowledge? Should these findings simply be archived for future reference, or can they be integrated into broader interpretations of settlement and land use? This presentation examines whether these slivers of archaeological sites and the fragmented data of infrastructure-driven archaeology can contribute meaningfully to our understanding of archaeologically marginal areas and reshape narratives beyond extensive excavations and well-known centers like Himlingøje. By analyzing the surrounding landscape and associated features, it argues that narrow linear surveys can be transformed into valuable knowledge rather than remain a mere by-product of development.

11:30 *Sam Turner and Tim Kinnaird*
New light on landscapes: using OSL-PD to illuminate chronology in landscape archaeology

Landscape archaeologists involved in large-scale infrastructure projects are often confronted by large numbers of archaeological features which cannot be dated by conventional means. This is especially a problem in the case of features from periods where dateable (or any) artefacts are scarce, and regions where samples suitable for radiocarbon dating are not preserved. The excavation of large numbers of undatable features reduces the benefits of fieldwork in terms of knowledge gained and also increases costs. Using optically-stimulated luminescence profiling and dating (OSL-PD) provides a new way to date most of the features commonly encountered during landscape archaeology work, including the fills of ditches and pits, earth banks, and agricultural features such as terraces or cultivation ridges. OSL-PD offers a cost-effective and low-impact way to characterise the dates and use-lives of features identified through geophysical survey, trial excavation or other types of prospection. It provides a radical solution which offers the possibility of delivering major advances in knowledge from landscape archaeology at significantly reduced overall cost. This paper will illustrate application of the technique through case-studies of recent infrastructure projects in the UK and beyond.

11:50 *Laura Bucci, Michela Frapporti and Fabiana Macerola*
Preventive archaeology and the design of electrical infrastructure projects: examples of integrated methodologies for project feasibility

As the Italian Transmission System Operator (TSO), Terna is responsible for more than 75,000 kilometres of high-voltage infrastructure and around 900 electrical stations. The company is key to aiding Italy's move towards sustainable energy and emission reduction. The incorporation of preventative archaeology at the earliest design stage is essential for ensuring that proposed power grid projects are both practicable and considerate of archaeological heritage. In response to this necessity, Terna's archaeology division created a unified approach, commencing with project feasibility, which blends established and innovative methods in partnership with specialists, anticipating analyses normally carried out in the following stages during the feasibility phase. The initial results of this process involve multiple levels of analysis, which include consultations of archives and specialized literature, surface surveys, analysis of aerial photography anomalies and geophysical surveys. This has led to the creation of integrated archaeological risk maps. The maps clearly and precisely delineate the archaeological context surrounding the proposed project, starting from the feasibility phase of an intervention. As a result, this provides Superintendencies with useful and comprehensive assessment tools while also expediting the authorization process and avoiding or reducing potential risks in subsequent construction phases.

11:10-12:30 Session 29B:
Landscapes on the Border: (Public-) Archaeological Perspectives on Boundaries and Marginal Spaces

CHAIRS: *Viviane Diederich and Michael Preusz*
LOCATION: U2 / 01.33

11:10 *Mark R. Groenhuijzen*
Beyond the Border: Interaction and Divergence along the Roman Lower Germanic Limes

The "Constructing the Limes"-project challenges the stereotype of the Roman Lower Germanic limes as an impermeable border separating the Roman world from the outside 'Barbaricum'. As part of the project, the extensive archaeological site database from the "Finding the Limits of the Limes"-project was further developed, now covering thousands of sites in the Netherlands, as well as neighbouring areas in Flanders and Germany, alongside a find record of ~100,000 find entries. This data has been subjected to aoristic analysis to be able to study temporal trends over relatively fine-grained time intervals (40 years). We then applied quantitative analysis to the data, particularly studying the development of the settlement landscape through time and the spread of particular find categories associated with networks of the Roman world. Regional comparisons reveal distinct trends north, on, and south of the limes. It may be concluded that the border's introduction resulted in divergent developments, though these were non-homogeneous across regions. Notably, interaction with the Roman world persisted even beyond its formal borders, underscoring the limes' dynamic role in shaping socio-cultural landscapes.

11:30 *Adrian Serbanescu, Valentin Bottez and Cristian Roth*
Roman Rural Landscapes in Moesia Inferior. Rural settlements in the regio of Histria from a geophysical perspective

Modern province of Dobruja (South-East Romania) is a region with rich historical background and has been a major 'highway' for populations moving from Eurasian Steppe into Europe for millennia. It flourished during the Greek and Roman periods, the catalyst behind it was the foundation of Greek colonies during the 7th-6th century B.C. starting with Orgame, Histria, Kallatis and Tomis. Beginning with the 1st century B.C. Roman influence in the region and culminates with in 43 A.D. when it is annexed. Within this context, the presentation aims to look the changes that occur after the annexation of the region in the Roman Empire and how the limes being established on the Danube and the implicit consequences that shaped the rural landscape in the hinterland of Histria – regio Histriae. A methodology that combines geophysical surveys with aerial imagery and GIS analysis was used to look at the results in the larger context of the region's administration, economy and road network. Magnetometry surveys helped map the sites and their internal layout while Ground-Penetrating Radar investigations were used to characterize structures and areas of high archaeological importance. Thus, a better understanding of the new organisation of the rural landscape is beginning to shape.

11:50 *Will Kennedy*
The Petra Hinterland Social Landscapes Project: Investigating the Socio-Political Make-Up of Rural Petra

Recent research at Petra has identified different social groups that were organized within spatially defined districts. Nabataean Petra's cityscape was thus divided into distinct social spaces. This highlights a social structure that was deeply rooted in family, clan or tribal traditions. In addition to the extensive explorations in urban Petra, more intensive investigations of rural Petra have now also gained scholarly attention. In this context, important archaeological sites were recently identified as possible markers of distinct social landscapes in Petra's surroundings. These include rural sanctuaries, isolated cultic installations, funerary monuments and rural mansions. Such sites highlight the complex social structure of Petra's hinterland, which may be described as a patchwork of various social groups - as is assumed for urban Petra. As the identification and analysis of these sites is so far based almost entirely on preliminary survey results, the Petra Hinterland Social Landscapes Project seeks to amend the record by investigating selected sites more in-depth. The project therefore aims at enhancing our understanding of the socio-political makeup of Petra's hinterland. This paper will discuss selected sites and examine how they might offer new perspectives on the social stratification outside Petra's urban limits in Nabataean-Roman times.

11:10-12:30 Session 6B:
Coastal landscapes through the ages

CHAIRS: *Pière Leon Frederiks , Kira Raith, Svea Mahlstedt and Moritz Mennenga*
LOCATION: U5 / 01.22

11:10 *Joé Juncker, Ferréol Salomon, Andrea Gaucci, Paolo Mozzi, Grégory Mainet, Thomas Morard, Marcello Turci and Laurent Schmitt*
Contrasting rates and synchronous patterns: Progradation and erosion in the Po and Tiber deltas from the beginning to the end of the Roman period

River deltas are exceptional geomorphological archives recording socio-environmental dynamics over the past 7000 years. Around the Mediterranean basin, human influence on deltaic sedimentation has intensified since the Bronze Age, reaching a turning point during the 1st millennium BCE/CE. As the birthplace of the Roman civilisation, Italy experienced significant population growth, technological advancement, and urbanisation, generating considerable environmental pressure. The Po and Tiber deltas, as the outlets of Italy's two largest river systems, provide contrasting yet complementary records of human-environment interactions during this chronological window. To reconstruct the multi-centennial trajectories of these deltaic landscapes, we create for both a Chrono-Spatial Model (CSM) that integrates geomorphological, archaeological, and historical data within a Bayesian statistical framework. This approach accurately quantifies deltaic progradation rates and identifies erosional gaps, providing essential data on coastal settlement patterns in response to shoreline mobility. The results reveal notably different progradation rates between the two deltas, but both systems display striking synchronicity in two key phases: accelerated progradation towards the 1st century BCE and widespread lobe erosion at the beginning of the Middle Ages. These parallel deltaic responses shed new light on how climatic variability and anthropogenic pressures interacted to shape fluvio-coastal landscapes over time.

11:30 *Bente Sven Majchczack, Ruth Blankenfeldt, Dennis Wilken, Sarah Bäumler, Eileen Eckmeier, Roland Filzwieser, Wiebke Kirleis, Søren Munch Kristiansen, Jutta Lechterbeck, Jens Schneeweiss, Philippe de Smedt, Immo Trinks, Jeroen Verhegge, Tina Wunderlich and Wolfgang Rabbel*
Uncovering farmsteads, villages, harbours and burials: New geophysical approaches to the settlement landscape of the island of Amrum (Nordfriesland, Germany)

The North Frisian Island of Amrum was a favourable settlement ground and displays an outstanding density of archaeological sites and monuments, ranging from the Neolithic to the Middle Ages. Since 2021, an interdisciplinary collaboration between the ROOTS Cluster of Excellence at Kiel University, LEIZA (Standort Schleswig) and Universities of Gent, Vienna, Aarhus, Bratislava and Stavanger, combines geophysical-archaeological prospection of the diachronic settlement landscape with geoarchaeological investigation into soils and sediments to shed light on adaptations to various hazards during the first millennium AD. We investigated the inner space of the Iron Age rampart ‚Krümwaal' as an agricultural area, the ‚Bearendeal'-area with diachronic settlement sites and the ‚Ann-Lunn'-wetland as a Viking Age harbour area. All sites are situated on the edge of the moraine core towards the marshes and feature numerous visible monuments.Our broad methodology includes Magnetic Gradiometry, Electromagnetic Induction (FD-EMI), Ground Penetrating Radar (GPR), Seismics, Coring and Metal Detecting. Numerous archaeological sites have been discovered, including farm-yards and longhouses of the Roman Iron Age and Viking Age, burial sites of the Bronze Age and Viking Age and a highly significant settlement with maritime access at the Ann-Lunn wetland, showing typical traits of a Viking Age trading harbour.

11:50 *Eileen Eckmeier, Ingo Feeser, Elena Amelie Hensel-Karamalakidou, Wiebke Kirleis, Bente Sven Majchczack, Jens Schneeweiß, Hannah Behrend, Tobias Rehder and Julius Wulff*
Characteristics of Plaggic Anthrosols on the island of Amrum (Northern Frisia, Germany)

Archaeological evidence shows that the North Frisian island of Amrum has been settled intensively in prehistoric and historic times. With the transition to agriculture, limited space and poor soil quality on the sandy Pleistocene sediments posed major challenges for the farming communities and required adaptations to subsistence farming. Common Plaggic Anthrosols in Northern Germany, or German "Plaggenesche", have been built during Middle Ages from layers of grass turf or heath sods enriched with animal manure, which were piled on top of less fertile soils to provide higher amounts of plant available nutrients. Plaggen soils that have been described on the North Frisian islands might be significantly older than others, with published archaeological data pointing at least to Bronze Age. They also might have been constructed from different kinds of materials, e.g. extracted from the marsh ecosystem. We aim to answer the open questions about their characteristics, possible use and their relation to the (pre) historic settlements on the island, by applying a combination of geoarchaeological, archaeobotanical, geophysical and archaeological methods. First investigations could confirm the existence of specific dark topsoil horizons in the central part of Amrum, that contain botanical remains dating to the Iron Age.

12:10 *Ajay Kumar*
Neithal (Littoral landscape): Text vs Materials – Case studies of Algankulam and Pattinamarudur

This paper examines the Sangam tinai, the classical Tamil taxonomy of five landscapes Kurinji (mountainous), Mullai (agro-pastoral), Marudham (fertile/agricultural), Neithal (littoral/coastal), and Palai (parched wasteland), focusing on Neithal and its inhabitants, the Parathavar, as portrayed in literature. The classical Sangam poetry romanticizes Neithal as a vibrant realm of tidal rhythms, distinctive life forms like mangroves and sharks, and lively settlements (Pattinam/Pakkam) engaged in fishing and salt-harvesting under the sea god Kadalon. This textual evidence is tested against archaeological data from key Coromandel Coast sites, Pattinamarudur and Alagankulam, spanning the early historic to medieval periods. The materials strongly reveal a dominant shell-working economy, where specialized artisanal labour—particularly shell-bangle production—was a preeminent occupation, often eclipsing the literary focus on fishing. These hubs facilitated extensive local trade with inland Marudham centres and crucial international commerce, evidenced by associated imported goods (Roman amphorae, Chinese celadon and porcelain) alongside shell products. By bridging the poetic tinai framework with empirical evidence, the study affirms Neithal's pivotal role in proto-urbanization and early globalization, revealing resilient coastal adaptations and the pragmatic foundations of ancient South Asian maritime economy.

11:10-12:30 Session 8B:
Exploring the Decolonisation Discourse in Mountain Landscapes: Rethinking Margins, Methods, and Meaning-Making

CHAIRS: *Francesca Chelazzi , Kirsten Hopper, Stefania Fiori and Lisa Doro*
LOCATION: U5 / 01.17

11:10 *Francesca Chelazzi, Kristen Hopper, Stefania Fiori and Lisa Doro*
Recap by session's organisers

11:15 *Francesca Chelazzi*
Damming the ‚Margins': Hydraulic Colonialism and the Submersion of Kurdish Upland Heritage

The mid-20th century witnessed an unprecedented surge in large-scale hydraulic infrastructure across Southwest Asia, driven by state-led modernisation agendas that profoundly reshaped both human communities and archaeological landscapes. This paper employs historical aerial imagery and community-informed spatial analysis to challenge the state-centric narrative of the Dukan Dam (1954-1959, Iraqi Kurdistan) as a neutral development project. By reconstructing the pre-inundation settlement landscape of the Kurdish uplands, we centre the experience of displaced communities and make visible the systematic erasure of their heritage. We frame the dam's construction as a form of ‚hydraulic colonialism', revealing its triple logic of oppression: epistemological (the devaluation of local hydraulic knowledge in favour of Western engineering expertise), territorial (the transformation of Kurdish uplands into resource extraction zones for Arab-dominated lowland irrigation), and archaeological (the permanent inundation of millennia of human occupation). The Dukan case is not a relic; with ten new mega-dams planned by the Iraqi government, its lessons are urgent. Decolonising the uplands requires interrogating not only historical processes but also the ongoing reproduction of extractive logics through contemporary infrastructure. As climate change intensifies water scarcity and states pursue ever-more ambitious hydraulic megaprojects, the lessons of Dukan remain urgent: whose water, whose land, whose future?

11:22 *Jacopo Scoz*
Decolonising Eleousa/Campochiaro: archaeology of a lumberjack "new town" in the (post-) Italian Dodecanese

This research examines Eleousa/Campochiaro, a „new town" founded in 1935 in the mountainous interior of Rhodes, during the Italian control of the Dodecanese (1923-1947). Built to host Italian lumberjacks from the Alpine region of Trentino Alto-Adige and promote silviculture, Campochiaro reflected Fascist settler-colonial ambitions to reshape settlement, landscape and society through demographic and environmental control.

Eleousa/Campochiaro allows to study the colonial relationship between the Fascist state, the Italian settlers, and the local subjects to the colonial regime in a well-documented scenario. Current research draws on published oral testimonies and archival sources, academic literature and GIS-based mapping of the changes in the settlement fabric. The postcolonial life of Eleousa further illuminates the layered afterlives of colonial heritage: the reuse of houses by Greek families, the conversion of Rationalist public buildings into a sanatorium (1947–1970), and subsequent abandonment raise questions of memory, appropriation, and belonging. Eleousa/Campochiaro thus offers a case study for rethinking (post-)colonial mountain landscapes as hybrid and evolving

places of encounter, where multiple communities negotiate the meanings of a shared, though contested, heritage. It also opens pathways for participatory projects in line with the Faro Convention, engaging both current residents and descendants of the Italian settlers.

11:29 *Hugo Romero*
The War at the End of the World: Colonial Landscapes in Southern Chile (16th–17th centuries)

Between 1550 and 1600, the Spanish Crown drove a rapid advance into southern Chile through urban foundations, defensive networks, and the reorganization of Indigenous territories under the encomienda. In 1598, a decisive Indigenous victory triggered a Mapuche–Huilliche alliance that destroyed seven southern Spanish cities and forced a retreat north of the Biobío River. Large areas remained under Indigenous control until the late 19th century. As an interdisciplinary research group, we reassess this period through a landscape archaeology lens that centers Indigenous agency in the making of the frontier. We combine a critical review of archival and secondary sources with pioneering fieldwork in Chile using drones and RGB, multispectral, thermal, and LiDAR sensors. This approach has identified more than fifty Indigenous and Hispanic defensive structures—forts, redoubts, earthworks, and fluvial positions—organized along river and lake corridors. Our results reveal a low-visibility warfare geography, intermittent and shifting over time, that structured mobility, chokepoints, and access to resources. We argue these enclaves, far from being peripheral, functioned as productive-military nodes that prefigured the colonial rural world. We propose an integrative framework that combines defensive materialities, historical cartographies, and remote sensing to explain how the colonial landscape was produced in the Andean-Austral south.

11:36 *Daniela De Simone*
Decolonising Upland Forest Archaeologies: Indigenous Mapping in the Nilgiri Mountains, South India

British rule framed Indian forest-dwellers as remote and isolated, therefore "primitive," a perception that limited historical inquiry and perpetuated Eurocentric perspectives rooted in racial theory, thus relegating forest-dwelling communities to the margins of global histories. The Nilgiri Archaeological Project, focusing on the Nilgiri Mountains (South India), a region inhabited by Indigenous communities, challenges these frameworks by integrating the histories of forest-dwellers into wider narratives of civilisation. Through their ecological expertise, particularly of seasonal cycles and resource distribution, these communities played a key role in the Indian Ocean exchange network from at least the 1st century CE. The Nilgiri plateau, with peaks above 2,500 metres and a distinctive subtropical montane ecosystem, features megalithic tombs on its mountaintops, which provide the earliest evidence of human occupation. Yet many of these sites remain obscured by agricultural expansion, afforestation, and religious re-use. In this presentation, I will show how the project integrates Indigenous mapping into spatial analysis and fieldwork. By combining colonial cartography, topographic surveys, and Indigenous knowledge, we reconceptualise space as a relational construct linking humans, non-humans, and landscapes. In just two seasons, this approach has identified more than thirty tomb sites, demonstrating the transformative potential of Indigenous frameworks for decolonising upland archaeologies.

11:43 *Roberta D'Andrea*
Exploring the historical and contemporary influence of local communities on Dolomites' forest landscapes through dendrochronology, ethnohistory, and public archaeology

Understanding past human–nature relationship is essential for planning a sustainable future. The forests of the Cadore Valley (Veneto, Italy), once vital to the prosperity of the Republic of Venice, provide a unique context for exploring how centuries of resource use have shaped Dolomites' forest landscapes. Today, these forests face critical pressures from mass tourism, climate change, storms like Vaia (2018), bark beetle outbreaks, and mountain depopulation – making the lessons from the past more relevant than ever. This research investigates the historical and contemporary role of local communities in shaping alpine forests through an interdisciplinary approach: dendrochronology (i.e., the study of tree rings) will reveal scientific evidence of human intervention on forests, while ethnohistory will recover local ecological knowledge about these cultural landscapes; public archaeology will bridge scientific and local awareness by actively engaging mountain communities through collaborative initiatives, to rebuild trust in research and co-develop long-term forest management strategies. Recently, Italian literature has romanticised mountain life, reflecting a growing fascination with simplicity and authenticity that feels detached from reality. This research challenges such narratives by amplifying the voices of those born and raised in these mountains. Can their stories reshape how we understand and manage alpine forests today?

11:50 *Faidon Moudopoulos*
Under the Forest: Using a multisource methodology to understand an afforested montane cultural landscape

The Zagori Cultural Landscape -recently inscribed on the UNESCO World Heritage List as Greece's first Cultural Landscape- embodies the fate of many Mediterranean mountains. Rapid urbanization at the aftermath of World War II and the Greek Civil War led to a sharp population decline leaving the mountains void of communities and agropastoral taskscapes. Forests have since reclaimed these terrains, burying premodern material culture beneath dense canopies that contemporary tourists perceive as "untouched nature". Yet, beneath these forests lie centuries of female peasant labor, male seasonal mobility, and the remains of once-visible sacred groves with ancient individual trees. Drawing on my dual perspective as a native of Zagori and a scholar, I employ a multisource approach, combining remote sensing, archival research, ethnography and pedestrian survey, to narrate these hidden landscapes. I offer a decolonial narrative of a region never colonized sensu stricto, yet was deeply shaped by the notions of cryptocolony and heritage politics.

11:10–12:30 Session 30B:
Manipulated and artificial bodies of water as archaeological landscape Relics

CHAIRS: *Thomas Becker and Andreas Vött*
LOCATION: U5 / 02.17

11:10 *Alberto Massari, Tommaso Quirino and Diego E. Angelucci*
The Making of a Water Landscape. Geomorphology and Human Manipulation of the Hydrography in the Western Po Plain

The sector of the Po Plain between Milan and the Ticino River (Lombardy, Northern Italy) displays an exceptionally dense hydrographic network, the result of centuries of water management, mainly for irrigation purposes. This stratified setting makes it challenging to reconstruct the original drainage pattern and to identify and date subsequent transformations of the hydrography. This paper presents the preliminary results of an ongoing PhD project investigating the long-term evolution of this water landscape by integrating archaeological, geomorphological, and historical data within a GIS environment. The mapping of water bodies depicted on historical maps, combined with environmental cartography and DTMs processed through specific algorithms, reveals a close relationship between geomorphology and historical hydrography. Artificialized spring watercourses (fontanili) often follow Pleistocene paleochannels structuring the plain, while the course of the Naviglio Grande – the main artificial canal built between the 12th and 13th centuries to connect Milan with the Ticino – is partly controlled by paleochannels of the river and alluvial fans of its extinct tributaries. Furthermore, the spatial distribution of sites, combined with excavation data and the geoarchaeological study of soil profiles, sheds light on the long-term interactions between human communities and water resources from the Neolithic to the Middle Ages.

11:30 *María del Valle López-Guadalupe Ruiz and José María Martín Civantos*
Mountain and water. an approach to draining galleries in spain

Traditionally, mountainous environments have been seen as marginal, but they are settings of sustained interaction between people and their surroundings that produced important innovations, including hydraulic technologies. We examine draining galleries as intermediary technologies linking communities and mountain environments, presenting the initial framework of an ongoing doctoral thesis. Based on a database documenting more than 7,300 draining galleries across diverse Spanish environments, the study explores how their presence in mountain areas reflects strategies for managing and using groundwater. Using a multidisciplinary approach that combines archaeological, hydrological, geomorphological, and historical perspectives, I argue these systems form part of traditional and ecological knowledge that has left a visible imprint on the landscape. Moving beyond portrayals of isolation and marginality, mountain areas appear as dynamic spaces where communities transformed the environment and altered hydrogeological conditions through productive infrastructures. From this viewpoint, draining galleries are key to understanding the historical development of mountain landscapes, showing how natural environments and human practices intertwined in the construction of water-management spaces. The research illuminates longstanding local adaptations and offers a framework for integrating historical knowledge into contemporary water management and conservation policies, emphasizing the value of place-based, low-tech solutions in mountain hydrosocial systems across rural regions broadly.

11:50 *Thomas Reitmaier, Samir Ait Oumghar and Abdallah Fili*
Water Management and Urban Infrastructure in medieval Marrakech: Archaeological and Landscape Perspectives on the "lost Oasis".

The functional use of water has been central to the development of Marrakech since its foundation by the Almoravids in the 11th century. Embedded in the semi-arid Haouz Plain at the foot of the High Atlas, the city developed a complex system of water management to address seasonal scarcity and flooding. Archaeological and historical evidence highlights the use of artificial canals (seguias and khettaras), urban wells, reservoirs, and irrigated gardens (e.g., Menara and Agdal) as integrated key elements of the city's infrastructure. These features reflect both practical strategies for water supply and flood control and a sophisticated understanding of landscape manipulation. Moreover, water-powered mills along diverted streams and cisterns illustrate the multifunctional use of hydraulic infrastructure in urban and agricultural contexts. Despite their historical importance, these systems have been only partially studied in archaeological research, and their preservation and functional interpretation remain challenging. This contribution gives an overview of the state of research and reconstructs the design, operation, and evolution of Marrakech's water networks. It situates the oriental-Islamic (peri-)urban aquatic landscape within broader debates on medieval urban water management and highlights the interplay between environmental conditions, technological adaptation, and landscape transformation in shaping human settlements.

11:10–12:30 Session 7B:
Landscapes of change: data, methods, interpretations

CHAIRS: *Ylenia Paciotti and Carlo Citter*
LOCATION: U5 / 00.24

11:10 *Luca Lai*
Layered landscapes of memory: exploring land use shifts through anthropotoponyms

Cultural landscapes can be traced through the material traces of human activities, or from histories and traditional knowledge associated with specific locations. The toponymy approach to landscape remains underexplored, considering the vast amount of data available, as well as the data that has yet to be recorded. I present a case study from the east coast of Sardinia, where the narrow category of anthropotoponyms—names corresponding to persons—has been investigated. A total of approximately 70 have been documented in a ca. 150-km2 area near Tertenia (NU), using both cartographic materials, archival sources, published books, and local informants. Names were assigned to categories, both formally and contextually, and their most likely chronological origin was estimated. The resulting pattern provides an independent proxy for land use from the Middle Ages to the present, which can be compared and integrated with archaeological, historical information and oral tradition to attain a deeper understanding of the landscape of memory that an entire system of place names represents for local communities. This can also help facilitate the reappropriation of the lived landscape, which colonization and modernity have severed from the mental reach of the young generations, who have lost their ancestors' daily relationship with the land.

11:30 *Ylenia Paciotti and Carlo Citter*
The vanishing sea. The western Mediterranean 1300-1600 CE

The Mediterranean at its peak around 1200 CE used to be the main focus of trade and cultural relations, along with the North Sea. Things changed dramatically in a relatively short time span. Around 1600 CE, while the latter used to be the centre of the colonial expansion, the former had almost vanished. Pisa, Venice and Genoa, the superpowers of the medieval sea routes, had been overwhelmed by Spanish, Portuguese and later Dutch and English networks of exchange. These major overturns impacted the ongoing process of transformation of landscapes. In this paper, we focus on some case studies to raise new questions about the connections between the local and global scales of change.

11:50 *Simone Grosso*
Land ownership, cultivation and land management in Maremma Grossetana between the Middle Ages and the Modern Period: an archaeogeographical and statistical approach.

The ANR PARCEDES (PARCEllaires agraires et Dynamiques d'Exploitation du Sol dans la longue durée) and my doctoral research have as their main objective the diachronic analysis of the organization and evolution of the agrarian parcel system, land ownership and soil exploitation in the Grossetan Maremma region (Tuscany, Italy) between the 14th and the 19th century. The comparison between medieval written sources (the Sienese Estimo of 1321) and the modern land registry, along with current geographic and archaeological data, allows for a highly detailed reconstruction of the evolution of the landscape of the Grossetan Maremma (plain and hills).

The application of the archaeogeographic and regressive method has made it possible to highlight phenomena of resilience and transformation, especially concerning land use (intensive deforestation in favour of cereal cultivation and pasture), landscape management (spread and end of transhumance), the organization of the agrarian parcel system, and land ownership (progressive lands hoarding evident from the 14th century). All these results will be contextualized within a paleo-environmental dynamic linked to the transformation of the Prile lagoon into a marshy environment, with the progressive abandonment of the area tied to the end of salt exploitation and the spread of malaria.

12:10 *Francesca Santi and Viviana Lanza*
Enduring Landscapes: The Case of Semproniano

The archaeological survey conducted in the Semproniano area within the framework of the Med2Mod project follows a landscape archaeology approach aimed at understanding long-term dynamics of occupation, land use, and transformation. The territory, defined by a hilly morphology shaped by erosion and remodelling, has been intensively occupied since pre- and protohistoric times. It was later profoundly modified by anthropogenic reforestation initiated in the 1950s and by intensive agricultural exploitation, processes that have affected both the archaeological legibility and the preservation of material remains. The analysis of extant masonry structures reveals construction techniques based on locally available stone, reflecting a close relationship between natural resources and building practices. The data indicate a long continuity of land use, where ongoing transformation and reuse have reshaped the landscape, rendering its earliest phases less visible. Surface surveys on ploughed and uncultivated land did not yield significant archaeological materials; nonetheless, this absence provides valuable information for reconstructing settlement patterns. The resulting preliminary map will serve as a foundation for future investigations employing advanced technologies and for participatory strategies aimed at enhancing the cultural and environmental heritage of the Semproniano area.

11:10–12:30 Session 13B:
Dynamic adaptations on dynamic landforms: Multidisciplinary Perspectives on Quaternary Populations

CHAIRS: *Parth Chauhan and Prabhin Sukumaran*
LOCATION: U5 / 01.18

11:10 *Prabhin Sukumaran and Parth Chauhan*
Dust, Drought, and Dispersals: Tracing Hominin Adaptations in Pleistocene Western India

The late Middle to Late Pleistocene was a period of pronounced climatic fluctuations that reshaped landscapes and influenced the trajectories of human populations across the Indian subcontinent. Emerging multidisciplinary evidence increasingly identifies South Asia as a key region for understanding the evolution, adaptation, and dispersal of prehistoric Homo sapiens. This paper integrates geoarchaeological, paleoenvironmental, and lithic datasets from alluvial and semi-arid settings to examine how phases of aridity, aeolian activity, and fluvial reorganization impacted hominin occupation, resilience, and mobility strategies. Recent investigations in the middle Tapi River valley, Central India, reveal complex sedimentary and cultural stratigraphy. Sedimentological, geochemical, and environmental magnetic analyses indicate intensified dust influx and progressive aridification during MIS 4 and early MIS 2, driving hydrological shifts, vegetation contraction, and expansion of open habitats. Despite these stresses, technological continuity across Middle and Upper Palaeolithic and microlithic industries reflects notable adaptive flexibility. Micromorphological and grain-size evidence documents alternating phases of stability and high-energy deposition, aligning with regional speleothem and lacustrine records. By situating these findings within subcontinental and continental frameworks, this study underscores India's role as a zone of long-term hominin resilience and innovation, and highlights the relevance of geoarchaeological perspectives for contemporary environmental and sustainability discourses.

11:30 *Elena Robakiewicz, Götz Ossendorf, Carolina Rosca and Annett Junginger*
Moisture variability on Human Timescales at Lake Nakuru, Kenya from the Last Glacial Maximum to the African Humid Period

The complex topography of the East African Rift System (EARS) results in variable rainfall, creating small rift basins that can amplify climate signals. Such "amplifier lakes" were likely hubs for early eastern African humans, as evidenced by eastern Africa's rich paleoanthropological and archaeological record. During the Last Glacial Maximum (LGM; 25-21 ka), rainfall dynamics of the EARS were altered as the global climate system shifted to an interglacial period leading into the Holocene. Lake Nakuru, a closed basin at one of the highest points of the EARS, is an amplifier lake that contains important records of environmental change since the Late Pleistocene. Here we present a multi-proxy record from the most well-dated section of two duplicate drill cores from Lake Nakuru. Using sediment analysis, µX-Ray Fluorescence data, and diatom identification with a multi-annual to decadal time resolution, we provide insights into lake depth and hydroclimatic changes from the LGM to the start of the African Humid Period (15-5 ka). Our records indicate that Nakuru was incredibly dynamic throughout this phase, including deeper, anoxic phases, highly alkaline conditions, and dry land-surface conditions. This high-resolution record indicates that many of these changes occurred on short, decadal scales, relevant to human societies.

11:50 *Pratik Pandey*
Integrating RUSLE Modelling to Understand Erosion and Prehistoric Site Preservation in the Ken River Basin, India

Quaternary period was marked by major climatic fluctuations, tectonic activities, and landscape transformations that significantly influenced human evolution and the preservation of archaeological records. In this context, present study focuses on understanding how geomorphological processes shaped the distribution and preservation of prehistoric sites in the Ken River Basin, central India. To achieve this, morphometric analysis was integrated with the Revised Universal Soil Loss Equation (RUSLE) model to assess the role of erosion and landscape dynamics. A comprehensive review of existing literature was first undertaken to compile previously reported archaeological data, followed by systematic field investigations that led to the discovery of additional prehistoric sites. These datasets were then analysed through detailed morphometric parameters, including slope, elevation, and geological settings, using ArcGIS 10.8.2. The model further quantified the spatial variation in erosion intensity, helping identify zones most affected by soil loss. The results demonstrate a clear correlation between site distribution, geomorphic setting, and erosion levels, indicating that geomorphological processes played a decisive role in site preservation and visibility in the KRB. Overall, this study emphasizes the significance of integrating RUSLE modelling and basin morphometric study in archaeological research for estimating erosional landscapes and advancing predictive approaches for site discovery and preservation

11:10–12:30 Session 22B:
Geoarchaeology in Vertical Landscapes – Methods, Potentials, and Emerging Questions

CHAIRS: *Kerstin Kowarik and Valentina Laaha*
LOCATION: U5 / 02.22

11:10 *Karsten Lambers, Lena Lambers, Bertil Mächtle, Mario Ranzinger, Angelika Abderhalden-Raba, Philippe Della Casa, Katja Kothieringer and Astrid Röpke*
Geophysical investigation of the terraced landscape of Ramosch, Switzerland

The well-preserved terraced landscape of Ramosch, Lower Engadine, Switzerland, has been shaped by natural and cultural forces over millennia. Since 2014, the interdisciplinary TERRA project has been investigating this landscape, focusing on changing strategies of resource management and land use on the northern slopes of the Inn Valley around key settlements such as the Bronze and Iron Age hilltop site of Ramosch-Mottata. Geophysical surveys at various scales have been essential in helping us to understand the complex, intertwined processes that formed the terraced landscape. We employed a variety of non-invasive methods, including electrical resistivity tomography, electromagnetic induction, and fluxgate and caesium magnetometry. Alongside evidence from minimal-invasive coring, this approach has revealed a complex geomorphology and the important role of human impact on the terrain in different settings. Key findings include detailed insights into the morphology of the terraces, such as the first evidence in this region of piled-up stone retaining walls in prehistoric terraces, a nuanced view of how suitable different terrain types were for different land uses, and clear evidence of human activity in a prominent area where no archaeological site had previously been recorded despite decades of research.

11:30 *Axel Cerón González, Soetkin Vervust, Matthias Vanmaercke, Ralf Vandam and Yannick Devos*
Soil memory of terraced landscapes: Diversity of objects and methods

The concept of soil memory primarily concerns soil features and embedded artifacts. Terraced landscapes, as sites of intense human-environment interaction, are hotspots of soil memories: a notion that has not been extensively explored in studies of terraced landscapes. The MedMory project aims to investigate how ancient societies across the Mediterranean reshaped their landscapes by constructing stone-walled terraces. A wide variety of terraces has been documented across three areas: the Cycladic Islands, southern Cyprus, and central Italy. The approach uses interdisciplinary terrace soil storytelling to examine the connections among soil properties, stone stratigraphy, and landscape features. Techniques such as soil micromorphology, image analysis of scanned thin sections, µXRF, geochemistry, lipids, sedaDNA, and phytolith analysis, along with OSL dating, aim to capture the "memory" of Mediterranean terrace soils.

11:50 *Francesca Cornella, Francesco Carrer, Tim Kinnaird, Thomas Reitmaier and Lisa-Marie Shillito*
Human interaction with Alpine soils: A Digital Geoarchaeological approach

Unravelling the complex interactions between human groups and mountain environments is crucial for understanding the continuous transformation of upland landscapes through time. Recent research shows that the long-term effects of pastoralism on mountain environments can be investigated using soils as archaeological proxies. In this study, we combine geoarchaeology with digital modelling to explore whether and how long-term pastoral practices have triggered landscape changes in two high-elevation sectors of the Silvretta Massif, Central-Eastern Alps. This transdisciplinary approach integrates geoarchaeology, landscape modelling and soil analysis to build a robust and holistic framework for investigating past pastoral systems and their relationship with slope dynamics. We believe that this approach will help assess and examine socio-ecological changes and trajectories in Alpine upland regions. Reconstructing past slope transformations will clarify the role of pastoralism in shaping mountain landscapes and ecosystems, while also shedding light on the extent to which natural systems have influenced pastoral choices and practices. In doing so, we also aim to inform and support current Alpine pasture management.

12:10 *Daniel Bursák, Katja Kothieringer, Sonnemann Till, Jan Volf and Martin Janovský*
Shaping the Hill: Geoarchaeology and Cultural Terracing at the Závist Oppidum

This study examines the hilltop oppidum of Závist on the edge of the Prague Basin—a steep, terraced site contrasting with the surrounding lowland settlements. The landscape, reshaped by massive artificial terraces, forms the setting for a minimally invasive workflow centred on soil coring and geochemistry, integrated with high resolution GPR and topography, while metal detector survey provides additional context. Our dataset from dozens of soil cores (stratigraphic and pedological descriptions; pXRF analyses of P, Mn, Zn, Cu, As, Pb), supported by radiocarbon and OSL dating, delineates activity zones and terrace related modifications inside the fortifications. Preliminary geochemical patterns show higher anthropogenic concentrations within the oppidum, with divergences—including Mn—indicating a long occupied core, while marginal sectors likely represent specialised zones expanding mainly during the Late Iron Age urban boom. The Balda area serves as a central case study: GPR maps terrace like stone structures and vertical terrain modifications, tested against the coring record and multivariate statistics (e.g., PCA). We propose a reproducible approach for vertical landscapes that couples subsurface architecture with soil geochemistry to reconstruct cultural landscape development in a strongly human modified setting.

12:30-14:00 **Lunch Break**

14:00–15:40 Session 3C:
Side effects from the construction of large linear infrastructure projects in Europe – chances for new insights on our landscapes

CHAIRS: *Jessica Meyer and Burkart Ullrich*
LOCATION: U5 / 02.18

14:00 *Burkart Ullrich, Ronald Freibothe, Rudolf Kniess and Henning Zöllner*
Geophysical prospection techniques for large-scale surveys

The presentation introduces a concept for high-resolution geophysical survey of large scale route corridors and construction areas using two complementary methods. Sample datasets illustrate the range of evaluation possibilities and highlight challenges in terms of data quality. Originally established as a targeted method for excavations and archaeological field research, geophysical methods are now increasingly applied at early stages in XXL projects as part of preventive archaeology. A wide range of methods is employed, characterized by the ongoing development of sensor technology, carrier systems, and algorithms for data evaluation. The current standard involves magnetometer surveys mainly using arrays of gradiometer probes with RTK-GNSS positioning. We combine this method with ground-penetrating radar measurements, which allows a more reliable assessment of the archaeological significance of numerous magnetic anomalies. In addition, non-magnetic subsurface structures, can also be identified. This expands the possibilities for interpretation beyond the identification of archaeological structures and can also include detailed information about natural geological features and more recent human impact along the route already in the run-up to the construction.

14:20 *Andreas Stele*
Drone Magnetometry in Large-Scale Archaeological Surveying: Methodological and Practical Challenges from a Heritage Authority Perspective.

Modern drone-based magnetometer systems make it possible to collect large amounts of data quickly, without needing direct access to survey sites. This approach reduces the extent of fieldwork, speeds up data collection, and is often more acceptable to landowners than traditional ground surveys. As a result, drone-based magnetic surveys are becoming more common, especially in large-scale archaeological projects.

This presentation assesses the performance of a commercial drone-based magnetometer by comparing newly acquired drone survey data with existing ground-based datasets from previously investigated sites. It further highlights key practical challenges encountered by users and heritage authorities in the application of this technology. Finally, it discusses approaches to improving data collection and quality, with the goal of contributing to best practice guidelines for drone-based magnetometry in archaeology.

14:40 *Paul Johnson, Krasimir Dyulgerski and Graeme Attwood*
Impacts & Risk: The role of geophysical survey in reducing environmental impact and shaping mitigation strategies for large infrastructure/renewables projects

The use of extensive geophysical surveys to evaluate the entire footprint of large-scale developments at an early stage is becoming increasingly common in the UK. With technical advances and increased capacity within the sector, schemes covering several hundred hectares can be considered to be relatively "small", while thousand-hectare surveys are also now unexceptional. This shift towards total coverage rather than sampling has obvious advantages for de-risking projects and minimising the impact of such schemes on the historic environment. These datasets also have the potential to maximise the value of subsequent intrusive works, but also – critically – to minimise the carbon footprint of those works and the development overall. This paper will explore these issues, and offer a roadmap for future work, drawing on a number of examples of projects undertaken by Magnitude Surveys including those using multiple techniques, and/or applied across environments traditionally thought non conducive to geophysics.

15:00 *Jessica Meyer, Martin Wetzel and Victoria Collins*
Non-Destructive Planning Certainty – Experiences from Route Construction Practice

The preservation of archaeological remains without disturbance remains a central challenge in modern infrastructure planning. Any subsurface intervention carries the risk of altering or destroying cultural heritage, making non-invasive survey methods, such as magnetic mapping and ground-penetrating radar, essential tools for identifying areas with potential archaeological significance. The recent expansion of renewable energy in Germany has led to a substantial increase in route construction projects, necessitating careful archaeological assessment at various stages of planning. At Eastern Atlas, we have been involved in numerous projects, providing targeted analyses aimed at accurately estimating the presence and distribution of archaeological features while minimizing intrusive interventions. This presentation will outline our methodological approach for analyzing relatively small target areas within extensive landscapes. Emphasis will be placed on the integration of geophysical data, statistical assessment of site probability, and the tailoring of analyses to specific project questions. Examples from ongoing and completed projects will illustrate both the potential and limitations of non-destructive planning strategies in complex, large-scale route construction contexts.

14:00–15:40 Session 29C:
Landscapes on the Border: (Public-) Archaeological Perspectives on Boundaries and Marginal Spaces

CHAIRS: *Viviane Diederich and Michael Preusz*
LOCATION: U2 / 01.33

14:00 *Rafał Bieńkowski*
The east coasts of Crete in Late Venetian Period

Typically, coastal regions are a distinct geographic boarder between land and water. In eastern Crete, a second boundary is also visible between small coastal plains and inland highlands and mountains.

Due to the high risk of external threats, such as pirate raids, the coastal regions of eastern Crete were almost completely abandoned during the late Venetian period, resulting in a near-complete void in the settlement structure, impact of which can be observed even in the modern settlement pattern.

In this presentation, the author considers the late Venetian period to be the 16th and 17th centuries, until around 1645, when this part of Crete was conquered by the Ottoman Empire. This period is characterized by a large number of written sources, especially in comparison to the early years of Venetian domination.

In this presentation, the author will attempt to briefly outline the situation of the coastal regions of eastern Crete and its impact on the interior region, drawing on historical written sources and archaeological evidence. For the purpose of the analysis and presentation of the collected data GIS methods were used.

14:20 *Sarah Joy Martini*
Direction, Scale, Mass, Nature: Evaluating the Form of Social Interrelationships in the Extreme North of Peru, 500 BCE – 1000 CE

In South America archaeologists have traditionally drawn an ancient boundary between the Central and Northern Andean cultural areas roughly following the modern border between Peru and Ecuador. The enduring rivalry between the nation states and contestation of the border complicated on-the-ground research in the borderland until 1999 and raises questions of the oft-observed tendency of contemporary borders separating different national research traditions to find their way into archaeological interpretations. Excavations of two sites in the extreme north of Peru – the highland site of Cerro La Plaza and the piedmont site of Las Pampas de Panecillo – provide new evidence with which to examine the supposed border, cross-border interactions, and the meaning of the border for both prehistoric and modern inhabitants of the borderland. Drawing on an analysis of the faunal assemblages and burial traditions encountered in these new projects, I evaluate evidence of local-focused networks of affiliation forming social interrelationships both within and outside of the zone of convergence of the Northern and Central Andean cultural groups. I argue that by defining the direction, scale, mass, and nature of social interaction, we can more clearly understand, and compare between sites, the lived experience of relationships for particular social groups.

14:40 *Bojana Radovanović*
Loca Theophaniae = Loca Liminum? Caves, Mountains and Border-Zones of Heterodoxy in Physical and Spiritual Universe of the Medieval Balkans

In Slavic mythological and ritual symbolism, mountain foothills, riverbanks, and caves mark thresholds between worlds. Rituals of magical character are often situated at the boundary between familiar and foreign spaces, raising the question: can similar boundaries be traced between orthodoxy and heterodoxy in the medieval period, or were they fluid? Caves served as refuges for heretics, outlaws, and unrecognized holy figures, as well as sites associated with legendary forces and timeless rulers. Mountains, as Loca Theophaniae par excellence, offered both sacred significance and remoteness from the wider world, hindering missionary activity, as in Taygetus in the Peloponnese or Thrace. The study also considers geographical traces of pagan survivals, supported by toponymic evidence, including references to the cattle demon Smerdaki in the Peloponnese. At Paljevo in southwestern Serbia, medieval Bogomil heresy is documented, while a nearby necropolis confirms the presence of Islamic, Orthodox, and Catholic communities, reflecting the region's position as historical Raška, a borderland and cultural crossroads. Finally, the Via Egnatia illustrates how both orthodox and heterodox populations moved through the Balkans in the Middle Ages. This study aims to highlight key sites of geographical and symbolic significance and explore possible "incisions" in geographical and spiritual loci.

15:00 *Jutta Kneisel, Dorothea Küster and Tina Wunderlich*
Crossing lines – cooking stone pits in the Landscapes

New magnetic investigations show that cooking pits are well recognisable in the magnetic image, despite the background noise of glacial sediments. The investigations of recent years at Kiel University show a wide range of different types. The presentation deals with the different types, their chronology and chorology, orientation and location in the landscape. The focus is on the linear rows of pits that stretch for hundreds of meters across the landscape. Are they boundary lines or gathering places, and why are they oriented along the much older burial mounds?

14:00–15:40 Session 6C:
Coastal landscapes through the ages

CHAIRS: *Pière Leon Frederiks, Kira Raith, Svea Mahlstedt and Moritz Mennenga*
LOCATION: U5 / 01.22

14:00 *Fabrizio Michelangeli, Alessandra Celant, Giulia Germinario, Paolo Maria Guarino, Mauro Lucarini and Andrea Babbi*
The Coastal Site of Bisenzio (Central Italy): Nature-Human Interaction in the 'Lacustrinescape' of Lake Bolsena between the 2nd and the 1st Millennia BCE

Rapid climate fluctuations and increasing human impact on ecosystems have led to remarkable changes of coastal environments during the Late Holocene. To address the complex relationship between climate, human communities, land-use and trade systems an interdisciplinary approach is needed. The 'lacustrinescape' of Lake Bolsena (Viterbo, Latium) and its coastal site of 'Bisenzio', which thrived on the south-west shoreline from the 2nd millennium to the mid-1st millennium BCE, provide invaluable palaeoecological proxies and informative archaeological evidence for investigating past environmental changes and their impact on human communities. The water level of the lake rose between the 2nd and 1st millennia BCE and again in historical times. This change had a significant impact on the settlement patterns and dynamics of human centres in the perilacustrine area. As part of the international ‚Bisenzio Project', a transdisciplinary approach combining underwater cartography, stratigraphic archaeological soundings, sedimentological and palynological analyses, radiocarbon dating, as well as high-resolution mass spectrometry, offers novel insights into palaeoenvironmental dynamics and the resilience and adaptation strategies implemented by past human communities in a changing coastal ecosystem.

14:20 *Nives Doneus, Slobodan Miko, Dea Brunović and Michael Doneus*
The Adriatic town of Osor: The "mini Suez Canal" and its impact on the rise and fall of the city

The historic town of Osor lies at the meeting point of the northern Croatian islands of Cres and Lošinj. In a region where navigation is difficult due to seasonal storm winds, every safe harbour is valued on the maritime route from Italy to Greece. The city may have taken advantage of these geographical conditions to gain strategic importance by use of the so-called Osor Channel between the two islands. This allowed navigation between Cres and Lošinj, enabling the city harbour to be incorporated into long-distance maritime routes. The role as a maritime node since the Iron Age is visible in the material culture remains. The 19th-century term ‚Mini Suez Canal' highlights the importance of the narrow sea route next to Osor. The Slovenian-Austrian project (2023–2026) therefore considers whether the city's maritime role, as evidenced by trade goods, is supported by its landscape context. The landscape-based approach, across the border between land and sea, uses archaeological and geological survey techniques (ALS/ALB, terrestrial and marine geophysics) and geoarchaeological research. This lecture will present the results of these studies and demonstrate how Osor's maritime accessibility determined its rise in the Iron Age and decline under Venetian rule.

14:40 *Camilla Colombi and Philipp Hoelzmann*
Prile-Project. Reconstructing landscape and networks in northern Etruria.

During antiquity, the Tyrrhenian coast was characterised by numerous bays and lagoons formed during the Holocene marine transgression. One of these was the Prile Lagoon, which covered the entire Grosseto plain. It was an important resource for the Etruscan settlements that were located on its shores. Nowadays, the lagoon has been almost completely drained. To understand settlement dynamics, resource use and regional networks during the Etruscan period, it is essential to reconstruct the ancient lagoon and surrounding landscape. To this end, the ‚Prile Project' is investigating the lagoon and its relationship with the Etruscan settlement of Vetulonia, combining geosciences, archaeology and non-invasive methods. Significant new insights into the extent and evolution of the lagoon, such as the documentation of ancient navigable waters in the immediate vicinity of Vetulonia, have transformed our understanding of the ancient landscape. Near the reconstructed lagoon shores, a monumental terrace complex has been discovered, providing evidence of lagoon use in the Etruscan period. This paper will present the project's results to date and possible interpretations of human–environment interaction in such a dynamic area.

15:00 *Matthias Kalisch and Elena Robakiewicz*
Climate Matters: Environmental Review of the Ionian Islands from the Bronze Age to the Roman Period

The Ionian Islands are located in one of the most seismically active areas in the Mediterranean Sea, creating an incredibly dynamic landscape. Past societies and their agriculture, trade, lifeways, etc. are impacted by these changing coastal landscapes and environments, but this interplay is often neglected, in part due to the warm, dry climate in the eastern Mediterranean that limits the preservation of environmental records like pollen. This presentation will provide a review of the most recent climate and environmental studies for the Ionian archipelago, focusing on the interaction between past peoples and the coastline Our chronological review of the environmental records of the Ionian Islands will be evaluated alongside a review on settlement activities on the archipelago from the Bronze Age to the Roman period. Through this interdisciplinary research, we demonstrate the benefits of bridging geological and environmental research into classical archaeological disciplines.

15:20 *Ellen Arler, Jos de Moor, Silvain Rumping and Timo Vanderhoeven*
The Flevopolder: Trial area for innovative archaeological research of buried drowned landscapes

The Flevopolder, in the center of the Netherlands, serves as a unique opportunity for the trial of new research methods into the interaction of humans with a rising sea level. Located in a sinking delta, the deposition of sediment throughout time has resulted in a stacked series of fairly undisturbed drowned landscapes. The new development of this polder from farmland into residential areas and the requirement for archaeological research with every development has given both the opportunity to investigate large areas at a time and also develop the research methods used to investigate the stacked landscapes. Several case studies are discussed to demonstrate the methodological innovation and improved understanding of its complex buried landscapes. In these case studies a variety of techniques, such as environmental analyses (including pollen, diatom, foraminifera and grain size), high-resolution coring, trial trenching, and geotechnical data like cone penetration tests, are combined. The scale of the projects, the application of a wide variety of methods and the complexity of the subsurface make the Flevopolder an ideal trial area for archaeological research of buried drowned landscapes. The results offer new insights and provide practical tools for researchers working in comparable drowned and buried landscapes worldwide.

14:00–15:40 Session 8C: Exploring the Decolonisation Discourse in Mountain Landscapes: Rethinking Margins, Methods, and Meaning-Making

CHAIRS: *Francesca Chelazzi, Kirsten Hopper, Stefania Fiori and Lisa Doro*
LOCATION: U5 / 01.17

14:00 *Francesca Chelazzi, Kristen Hopper, Stefania Fiori and Lisa Doro*
Recap by session's organisers

14:05 *Jennie Bradbury*
Thinking with and within Mountain Landscapes: challenging existing narratives

Mountains have been conceptualized as isolated refugees, inhospitable wildernesses, static or unchanging landscapes, or even zones of catastrophic extraction. These narratives may hold true for some regions and periods, however, recent methodological and theoretical developments are enabling archaeologists to explore and envisage mountains not as static backwaters or irrelevant peripheries but as active and dynamic landscapes that formed an integral part of ancient lives. Drawing upon research from recent fieldwork in foothill and mountainous zones in Lebanon, this paper explores some of the different methods and perspectives used to document and interpret archaeological features in these regions. By reflecting on strategies and practices that have proved both successful and unsuccessful, I will explore examples of the alternative modes of habitation, interaction, and communication present in such landscapes, while also bringing to light some of the underlying biases that archaeologists studying these regions have encountered. Finally, this contribution will consider the benefits of bringing diverse regions and environments, from mountains to coast, into closer conversation and the importance of adopting and developing flexible, collaborative, and adaptable modes of enquiry.

14:12 *Cecilia Dal Zovo*
Astoral Trails as Micro-Silk Roads: mobility, elevation, and meaning in the landscape of the Gobi-Altai Mountains (Mongolia) and beyond

In Central Asian and Mongolian archaeology, prehistoric and historical Silk Roads are often described as long-distance connections between sedentary societies of eastern and western Eurasia across boundless steppe: a flat, empty space inhabited by „nomads". I propose that, in fact, elevated and arid mountain environments characterised the context where pastoral communities thrived and seasonally moved across an articulated network. To counteract traditional historiography, moreover, I suggest approaching these dynamics through the concept of Micro-Silk Roads: local relational pathways generated by pastoral mobility, which provided foundation and structure to long-distance interconnections as early as the second millennium BCE. By foregrounding seasonal pastoral mobility as a creative force and persistent spatial knowledge in local landscapes of movement, this perspective challenges sedentary biases about mobile communities and the conceptualisation of the Silk Roads, contributing to the decolonisation of traditional archaeological narratives. In dialogue with my TRAILS project, which explores pastoral mobility in relation to rock art in the Gobi-Altai mountains, I also aim to shed light on the central role of mountain space and drylands, where the long-term adaptive mobility of local pastoral communities emerges as active tool of power and meaning-making in a complex and interconnected landscape over time.

14:19 *Carlo Bicchierai, Francesca Bindelli, Federica Carbotti and Elena Gazzoli*
First result and future prospects from surveys in the Monti della Laga (Italy), traces of agro-pastoral landscapes.

Monti della Laga are a mountains ridge between southern Marche and northern Abruzzo. A crossroads of people, roads and tracks, this area has never received consistent attention in archaeological studies, despite boasting a considerable number of tangibles traces, such as structures, dried-up ponds, terraces, and gutters, connected with economic exploitation of the territory. Preservation of some of these elements, together with the significant reduction in human presence, makes this area perfect for studying the interaction between humans and mountains. Surveys carried out between 2024 and 2025 by the University of Bologna were able to provide a first mapping of archaeological remains and laid the premises for more in-depth investigations.

14:00–15:40 Session 30C: Manipulated and artificial bodies of water as archaeological landscape relics

CHAIRS: *Thomas Becker and Andreas Vött*
LOCATION: U5 / 02.17

14:00 *Fabian Becker, Yannic Grohmann, Ida Rewicki, Brigitta Schütt and Joris Starke*
By the Rivers of Pergamon: Engineering, Floods, and Urban Transformation

The Selinus river, running through the urban core of ancient Pergamon, illustrates the interplay between river dynamics and engineering in Mediterranean cities. From the Hellenistic period onward, urban development shifted from the slopes of the acropolis with distinct hydrological constraints toward river banks, where the hydrodynamic regime prompted engineering interventions. Embankments, a monumental culvert beneath newly developed neighbourhoods, and buildings spanning entire tributary valleys transformed torrential streams into regulated urban watercourses. Aqueducts for water supply developed accordingly. Geoarchaeology indicates that such measures only temporarily stabilized the system—if at all. Sediment profiles from the Selinus alluvial fan show massive fine sediments burying an ancient palaeosoil, marking flooding and aggradation in the time of river engineering. Palaeohydrology is currently applied to reconstruct ancient flow patterns now overshadowed by modern measures. In our presentation, we highlight relics of Roman hydraulic manipulation by situating the river as both an archaeological and geomorphological archive. Drawing on building research, sedimentology, geomorphological mapping, archival data, and flow reconstructions, we explore the co-evolution of urban expansion, river dynamics and landscape change in Pergamon. This might help to understand modern engineering measures (including embankments and dams), that continuously affects the rivers of Pergamon.

14:20 *Christiane Hemker*
Nothing works without it – water management in the prehistoric and historic tin mining areas of the Ore Mountains/Saxony

Old open-cast mining in tin deposits is often accompanied by artificial watercourse relics, provided these have been preserved. The separation of tin grains from sediment is based on the principle of gravity through continuous washing and sieving with water. For this purpose, rivers and streams in the tin mining areas were diverted and artificial drains, wooden gutters and washing troughs were installed. Due to their easy accessibility, the open-cast mining areas in the Saxon-Bohemian Ore Mountains offer excellent opportunities for archaeological and scientific research. As part of the ongoing ArchaeoTin project, the dimensions, contours and internal structure of Bronze Age and medieval tin mining areas were recorded and evaluated using LiDAR, DTM and maps. In addition, mining archaeologists carried out on-site investigations and surveys. Initial results enable us to understand how early placer mining worked and to distinguish and categorise different forms of tin mining. This also includes the sophisticated hydraulic structures – water management – in the placer areas, some of which are impressively large.

14:40 *Lukas Werther*
Navigable Canals in Europe from 150 BC to 1300 AD. An Overview

Men-made navigable canals serve to optimise natural waterways. In Europe, their origins date back to Antiquity and the Middle Ages. The paper presents an overview of the development of early canal construction between the Mediterranean and the Atlantic. It is based on a systematic analysis of over 200 archaeologically and historically documented canal constructions in an area between northern England, the Iron Gate, central Italy and the Pyrenees. From the first canal construction boom in Roman Antiquity to the widespread abandonment of construction and maintenance in Late Antiquity and the Early Middle Ages to the renewed construction boom of the High Middle Ages, important traditions, actors and conditions for the construction of artificial waterways will be discussed. Selected examples, such as the so-called Fossa Carolina connecting the catchments of Rhine and Danube in 792/793 AD, will be discussed as early Anthroposphere and large-scale landscape modifications.

14:00–15:40 Session 7C:
Landscapes of change: data, methods, interpretations

CHAIRS: *Ylenia Paciotti and Carlo Citter*
LOCATION: U5 / 00.24

14:00 *Federica Barbara Matteoni and Chiara Pupella*
Architectural Change in the Lombard Rural Landscape from the Late Middle Ages to the Early Modern Era

From the late fourteenth century, the Lombard region played a key role in the reorganization of agricultural land and the concentration of landownership, following the major demographic crises at the end of the 1300s. Archaeological studies of preserved historical buildings make it possible to explore these changes through material evidence, tracing the rise and development of large rural estates that shaped a new economic system. In the areas surrounding major cities, resource management and land planning became tools for transformation and profit. Monastic communities and landowning elites also played an important part in controlling and developing the territory, acting as key figures in agricultural and social organization. Through a selection of case studies, this paper illustrates how rural settlements around the main cities changed over time. Using a multidisciplinary approach that combines archaeological, historical, and geographical sources, it connects long-term spatial dynamics with current policies for managing and promoting rural and mountain landscapes. Understanding architectural and landscape layers can therefore provide practical tools for sustainable regeneration and integrated territorial governance.

14:20 *Matteo Garbarino, Nicolò Anselmetto, Simona Cavallo, Matteo Domanico, Luca Mauri, Raffaella Marzano, Flavio Ruffinatto, Alma Piermattei, Francesco Maimone, Alan Crivellaro, Michele Freppaz, Emanuele Pintaldi, Valeria Colombo, Samuele Voyron, Guido Stefano Mariani, Marco Maron Pot, Michele D'Amico, Clara Dogny Piette, Walter Finsinger, Vincent Montade, Ambra Idone, Natascia Druscovic, Laura Caserta, Dante Marquetand Gabriele Sartorio*
The Walser legacies on cultural forest landscapes of northwestern Italy

Land-use history is often reconstructed by means of sector-specific approaches that only partially capture the complexity and distinctive features of traditional land-use practices. Here, we adopt a multiscale and multidisciplinary approach grounded in historical landscape ecology to reconstruct the anthropogenic dynamics that have been shaping the landscape structure in the remote San Grato valley (Aosta, Italy) from the 15th century to the present. Within the framework of the Interreg project "DAHU," we draw on a variety of approaches to investigate the historical interactions between climate and human activity that have given rise to the cultural landscape of Walser populations. Landscape-scale analysis was based on land-use/cover classification from historical maps (AD 1760, 1895) and aerial photographs (AD 1954, 2020). Preliminary results reveal strong structural changes of the landscape over time, driven by major socio-economic transitions that shaped the composition, density, and extent of subalpine forests. The mosaic of open areas patches for grazing or cultivation, grazed woodland, and dense forest has varied considerably over the past four centuries, with a marked decline in spatial complexity over the past 70 years. Our approach exemplifies how a multidisciplinary and multi-scalar analytical framework can effectively capture land use legacies on today's alpine landscapes.

14:40 *Ralf Hesse-Zubrzycki*
From forest to farms and back again: settlement dynamics and economy in the southern Black Forest

LiDAR-based archaeological prospection in Baden-Württemberg has revealed a landscape dotted with numerous abandoned farmsteads in the now largely forested southern Black Forest. Recorded features include remains of stone buildings, house platforms, clearing cairns, field boundaries and hollow ways as well as dams and water ditches related to mills and water-meadow irrigation. In this marginal mountain landscape with thin soils and short summers at elevations around 1000 metres, establishment and survival of farmsteads was closely associated with demographics, cul-ture and climate. Farming and pastoral economies at these elevations go back to the Middle Ages. The latest and most extensive expansion of upland settlement occurred during the 17th to 18th century: A large number of small, dispersed farms survived on a mixed economy of grain and live-stock farming in combination with forest products (charcoal, timber), cottage industries (e.g. clock-making) and itinerant trade. This post-medieval agricultural expansion was short-lived and its re-versal driven by a combination of factors including industrialisation, urbanisation and the climatic cooling of the Little Ice Age. Already by the mid-19th century (after the 1816 Year Without a Sum-mer), historical maps document significant reforestation where agriculture was given up. LiDAR survey and historical maps together document massive land use changes.

15:00 *Marie Kaniecki, Anne Köhler, Rita Gudermann, William J. Fletcher, Anja Linstädter, Natascha Mehler, Ulrike Werban and Christoph Zielhofer*
Parallel histories? A comparative GIS-based study of peat subsidence in Donaumoos and Rhinluch

Peatlands are important long-term carbon sinks and play a crucial role in water regulation. Over the past centuries, many Central European peatlands have been heavily modified by human activities for land reclamation. One key consequence of these interventions is peat subsidence resulting from drainage, which lowers the groundwater level and leads to the drying of peat surfaces, shifting an anaerobic to an aerobic mileu. This promotes microbial degradation, surface lowering due to wind erosion and peat cutting. Understanding the extent and dynamics of these processes, which generally lead to peat loss, is essential for reconstructing long-term anthropogenic landscape change. This study examines the consequences of drainage over the last 250 years in two wetland regions: the Donaumoos (Bavaria) and the Rhinluch (Brandenburg). Using old maps, contour lines were vectorised and interpolated into digital elevation models (DEMs) to estimate peat subsidence rates and their temporal variations. The cartographic data provide a comparative perspective on the dynamics of peatland transformation. This approach forms the basis for estimating historical carbon losses associated with peat degradation, as well as the potential carbon storage linked to peat rewetting and preservation - an essential step towards understanding long-term environmental impacts.

15:20 *Maxi Maria Platz*
Proto-industrial development structures and landscape change in the western Ruhr area (15th–19th century)

This article examines long-term landscape change in the western Ruhr region from the late Middle Ages to the beginning of the 19th century. The aim is to identify the settlement topographical parameters that led to the region's later development into a hotspot for coal and steel. The assumption of a linear transition from an agricultural to an industrial landscape is critically questioned. Methodologically, the study combines GIS-supported spatial analyses of settlement and land use changes, archaeological findings and archival source analysis. The results show that the study area was already characterised by high settlement density, export-oriented production and infrastructural efficiency in the late Middle Ages. The estuary area of the Ruhr and Emscher rivers into the Rhine was already a hotspot of early capitalism in the pre-modern era, where trade routes crossed. Proto-industrial dynamics formed their own spatial signatures and temporal rhythms, challenging the common narrative of a sudden 'industrial revolution'. This article discusses how these transformation processes become visible (or invisible) in material and written evidence and how multi-perspective data sets and methodological combinations reveal differentiated patterns of socio-ecological change in a landscape undergoing capitalist transformation.

14:00–15:40 Session 22C:
Geoarchaeology in Vertical Landscapes – Methods, Potentials, and Emerging Questions

CHAIRS: *Kerstin Kowarik and Valentina Laaha*
LOCATION: U5 / 02.22

14:00 *Zaira García-López, Jadranka Verdonkschot, Joeri Kaal, Carlos Otero-Vilariño and Felipe Criado-Boado*
Exploring neolithic human–environment interactions through the geoarchaeology of megalithic mounds in the Sierra del Barbanza (NW Iberia): Preliminary Results

This paper presents the initial results of an ongoing study within the MILESTONE project, which aims to reconstruct the paleo-environment of the Sierra del Barbanza (NW Iberia) to support landscape and visibility analyses. The research focuses on the geoarchaeology of Neolithic megalithic mounds as a means to explore how the individuals interacted with and transformed this mountainous environment. The area's exceptional density of burial mounds makes it well suited for sediment-based studies of past human–environment interactions. Prior to the excavations carried out during the spring and summer of 2025, a geophysical survey of the area was conducted. Current work centers on the physical and geochemical characterization of soils and sediments from selected tumuli and nearby fluvial contexts. Analyses include granulometry, pH, X-ray fluorescence (XRF), and stable isotopes. These data are being integrated to identify preliminary patterns related to construction materials, depositional processes, and environmental settings. The study highlights the potential of sediments to reveal how Neolithic communities shaped and understood the Sierra del Barbanza landscape, forming a basis for further research.

14:20 *Giovanna Pizziolo, Wieke De Neef, Gaia Mustone, Carlo Tessaro, Peter Attema, Antonio Larocca, Jan Sevink, Luigi Bloise and Michael Meyer*
Human-environment interactions in the deep past: first results from the Piani di Pollino mountain landscape (Pollino National Park, southern Italy)

Prehistoric occupation in the southern Apennines is mostly known from cave sites and other sheltered locations. Therefore, the newly discovered open-air palaeolithic landscape of the high plain (ca. 2000 m a.s.l.) of the Piani di Pollino (Basilicata, Italy) offers a new perspective on long-term hunter-gatherer activity in the mountain landscape of the Pollino mountains. Lithic artefacts are found in locations strategically located near a major mountain pass that formed a bottleneck for wildlife migrating from and to the mountain uplands, and thus provided an excellent hunting location. Surface artefacts found in erosion patches in the vicinity show that paleolithic hunters used locally available quartzite to make tools, but also brought flint and chert from further away. In this presentation we present the first results of material studies, geoarchaeological work and geochronological dating at an exposed erosion gully near the mountain pass, where we recorded a stratigraphy between the Late Palaeolithic and the Middle Bronze Age. Together with an overview of the technological complexes found in the surface assemblages in the wider Piani di Pollino, we discuss the long-term prehistoric human-environment interactions in this mountain landscape.

14:40 *Luca Forti, Guido Stefano Mariani, Roberto Sergio Azzoni, Ilaria Mazzini, Andrea Zerboni and Pierluigi Pieruccini*
Human geomorphology and land use dynamics in the mountain landscapes of the central Apennines

The landscape of the central Apennines (Italy) offers an exceptional example of how communities have adapted to and made use of a mountain environment. Over time, agricultural practices, pastoral activities, settlement organisation, and defensive strategies have produced a layered anthropogenic landscape that reflects both environmental adaptation and cultural resilience. Even though many of these areas have been recently abandoned, the long-term interactions between geomorphic processes, land use systems, and settlement dynamics have left permanent marks on the territory.

This study employs an interdisciplinary geoarchaeological approach, combining geomorphological mapping, sedimentary and environmental proxies, archaeological evidence, and historical sources, to investigate the role of terraced slopes, transhumant routes, and fortified hilltop sites (castellieri) in shaping multifunctional mountain landscapes. These elements reflect the interplay of diverse strategies of land management and resource exploitation across shifting climatic and socio-economic conditions from prehistory to modern times.

By interpreting these mountain areas as territorial palimpsests where natural morphogenesis and human action continuously overlap, the study highlights how local communities have persistently reinterpreted and transformed mountain spaces, turning areas once considered marginal into productive, interconnected, and resilient landscapes.

15:00 *Sabina Ghislandi, Andrés Menéndez-Blanco and Anna Maria Stagno*
Hidden Signatures in the Soil: Reconstructing Human Use of Mountain Landscapes on the Entzia Plateau (Basque Country)

Archaeological research in mountainous regions frequently encounters a paucity of material evidence, challenging to interpret. In these cases, geoarchaeological analyses can be a powerful tool for detecting indicators of past uses and activities. This contribution illustrates the geoarchaeological results of the investigations – within the ANTIGONE Project (ERC-StG2019) framework – conducted on the Entzia Plateau (Álava, Basque Country), used as common land for agro-silvo-pastoral practices since the Middle Ages. Archaeological surveys identified the remains of several collapsed dry-stone structures, hypothesised as shepherd huts or sheepfold. Excavation tests yielded limited macroscopic evidence. Thus, soil micromorphological and chemical analyses were undertaken, to detect microscopic traces indicative of human or animal activity. The results revealed the presence of microfeatures strictly related to the deposit within the structures, which suggest the use of these constructions for human occupation rather than for animal stabling. In addition, soil investigations along the plateau showed process of soil acidification, likely caused by the practices of continuous grazing and accumulation of organic matter. This observation highlights the complex interplay between natural and anthropogenic factors in shaping the present landscape. The results confirm the role of geoarchaeology to delve deeper into the interpretation of these silent structures and spaces.

15:20 *Kerstin Kowarik and Valentina Laaha*
Dirt(y) Talks: Interdisciplinary Approaches to Environmental Archives to Reconstruct Human-Environment Relationships on the Dachsteinplateau, Austria

The Dachstein plateau in Austria, due to its proximity to Hallstatt, has long been the focus of archaeological interest. In the 1980s, structures correlating with alpine pasturing were dated to as early as the Middle and Late Bronze Age. Until recently, only traditional archaeological methods have been employed to investigate these remains. While these approaches brought valuable insights into the existence and old age of pasturing practises in the region, they also raised numerous questions regarding, for example, probable Neolithic human presence, anthropic activity besides pasturing, land use change, and the overall interplay of human and environmental systems within these sensitive ecosystems. Here, new and developing approaches from bio- and geoarchaeology provide invaluable possibilities to overcome challenges arising from the lack of traditional archaeological material by opening up the rich local sediment and soil archives. Recent campaigns on the Dachstein plateau therefore focused on obtaining sediment and soil samples for fine-grain 14C-dating, micromorphology, multi-element analysis, sedaDNA, lipid analysis, and multi-omic approaches. Through this combination of interdisciplinary cutting-edge approaches, we aim to reconstruct and better understand human presence and activity on the Dachstein plateau and also provide a base for the further development of such endeavours in (high) mountain contexts.

15:40-16:10 **Coffee Break**

16:10–17:30 Session 29D:
Landscapes on the Border: (Public-) Archaeological Perspectives on Boundaries and Marginal Spaces

CHAIRS: *Viviane Diederich and Michael Preusz*
LOCATION: U2 / 01.33

16:10 *Hadi Alrasses and Hadi Ibrahim*
Tracing Ancient City Territories in the Eastern Provinces: Insights from the 2023–2025 Archaeological Surveys in Massyaf

The only sources that provide information about the administrative divisions of settlements and cities in the East during the Roman and Late Antique periods are historical accounts, such as those by Pliny the Elder, in addition to ancient cartographic evidence like the Tabula Peutingeriana. While these sources mention the existence of cities, they do not specify the actual extent of their territorial control. Determining the true boundaries of urban territories is therefore extremely difficult, yet several approaches can be employed to trace them. The first approach is material and archaeological, and fortunately, some evidence has survived—most notably inscriptions from northwest Palmyra that document the city's boundaries. The second method involves examining architectural and religious features distinctive to each region, such as Palmyrene stylistic traits or the characteristics of church architecture in the Late Antique period between Antioch and Apamea. This paper applies these approaches to the Masyaf region, located in the western countryside of Hama, Syria, where an archaeological survey conducted in 2023–2025 revealed new discoveries. By applying the aforementioned methods to these findings, this study seeks to approximate the geographical extent of regional influence and to situate the results within their historical and chronological context.

16:30 *Stefan Wolters, Viviane Diederich, Alfred Wolf, Albert Konrad and Rainer Schreg*
Landscape archaeology and public archaeology: The cultural heritage of the German-Czech border and its benefits for the urban development of Bärnau

Landscape archaeology holds strong potential for public archaeology, as people continue to interact and move through the landscape. Borders in particular influence people, societies, and landscapes. We investigate the social effects of public engagement at the German-Czech border, dating back to the Middle Ages. Despite its local stability it has seen remarkable changes. Located on the route between Nuremberg and Prague, Bärnau held a central position in 14th-century international trade. In the 20th century the Iron Curtain divided neighbours, cut contacts and families, placing Bärnau in a marginal situation until the 1990s. Today, archaeological projects and voluntary initiatives by residents across the border revitalize relations, fostering quality of life, identity, and tourism. For more than 10 years the History park Bärnau displays reconstructions of medieval settlements and cultural landscape. Looking at citizens'personal experience,we reflect the role of landscape archaeology for scientific communication, local identity and future initiatives. This example illustrates the potential of cultural landscapes in the framework of public archaeology. It shows how landscape history may trigger future development of regions with limited infrastructure and declining population. A holistic approach of archaeology, public engagement and understanding landscapes as living space may strengthen community cohesion and future regional development.

16:50 *Leo Klinke*
Borders in mind - borders in landscape. High-resolution, diachronic investigations of a borderland in North-West Germany

The case study traces the evolution of a borderland over time. With the beginning of sedentary life and the construction of first monumental buildings, the megalithic tombs, during the late Neolithic period, a first structuring of the landscape became apparent. Visibility analyses were used to reconstruct the first settlement areas, which demarcated different territories on a small scale. A radical shift occurred at the beginning of the Metal Ages, when other landscape areas were sought out. The study area lies at the intersection of two early to middle Iron Age burial customs: 'Familiengrabhügel' and 'Viereckgräben'. These two burial customs converge within the study area. Landscape analyses reveal direct communication corridors and lines of sight between monuments of different burial customs. Nevertheless, the people remained rooted in their traditions and resisted change or assimilation. It should be emphasised that there are no natural features that would deterministically explain the separation of these two burial customs. Fascinatingly, in the late Middle Ages, a military defence system a so-called „Landwehr" was erected as a physical demarcation line, precisely on the former Iron Age border. The construction of this border fortification thus manifested the conceptual idea of separation, still forming today's municipal boundaries.

16:10-17:30 Session 6D:
Coastal landscapes through the ages

CHAIRS: *Pière Leon Frederiks, Kira Raith, Svea Mahlstedt and Moritz Mennenga*
LOCATION: U5 / 01.22

16:10 *Agata Feldens, Daniel A. Hepp and Svea Mahlstedt*
From fresh- to saltwater environment – A coastal microregion in the late Mesolithic of the western Baltic Sea (SUBNORDICA project)

The Wismar Bay is hosting some of the most thoroughly studied Stone Age underwater sites along the German Baltic Sea coast. In the ERC project SUBNORDICA we are collecting data to model human inhabitation preferences in changing coastal landscapes of the early Holocene. A detailed landscape reconstruction around known sites in the Wismar Bay is an important prerequisite for this approach. By integrating legacy data on archaeological details and chronological input from dendrochronological and radiocarbon dating, we have set up a survey strategy targeting former lakes and shore lines in the vicinity of three Stone Age sites. They are situated on and around a small island that were separated from the mainland by a narrow depression, which is part of a larger channel network that likely played a significant role in the context of rising sea levels. Using newly acquired sub-bottom sonar data, we identified substantial sediment infills in these depressions. By sampling these layers with a diver-operated vibrocorer we recovered a variety of organic and mineral deposits, enabling further sedimentological, geochemical and botanical analyses. Comparing on-site and off-site samples, we gain insights into the environments chosen by Stone Age inhabitants for their stays in these dynamic landscapes.

16:30 *Ryszard K. Borowka, Joanna Dudzinska-Nowak, Adam Michczynski, Svea Mahlstedt and Felix Bittmann*
Shoreline Changes of the Southern Baltic Coasts During the Late Holocene in Light of Dating Submerged Forests

Among the palaeogeographical data useful for reconstructing former shorelines, particularly valuable are outcrops of organic sediment layers (peats, fossil soils), and especially fossil tree trunks found in their natural position in the beach zone at the edges of sandy barriers, found at several locations on the beaches of the southern Baltic coast. This supports the assumption the entire complex of lagoon and marsh sediments formed in the onshore zone of the barrier and the entire barrier has moved landward. 14C-dating of organic sediment, combined with the geomorphological situation, enabled to estimate the rate of landward movement of the barrier coasts. The presence of numerous depressions filled with pre-Littorina biogenic sediments, located on the seabed, north of the modern shores, is documented both by direct data (underwater drilling) and indirect data, in particular the washed up on the beach after heavy storms a large peat lumps, detritus gyttjas and lacustrine mud deposits containing freshwater malacofauna. These drowned landscapes are expected to have been inhabited by Holocene hunter-gatherers as indicated from neighborhood areas and stray finds in the area. A detailed reconstruction of the coastal retreat is the prerequisite for targeted underwater archaeological surveys in the context of the ERC SyG SUBNORDICA.

16:40 *Sine Kabel and Katrine Juul Andresen*
Flooding of tidal estuaries – A case study from the eastern North Sea

After the last glacial maximum, ~20.000 BP, the eastern North Sea region transitioned from a glaciofluvial landscape to a shallow marine setting. This transition was largely governed by cli-mate-induced sea level rise, flooding the former land area, Doggerland. In Doggerland, the Elbe Palaeo Valley and the Dogger Bank constituted major topographical features and important landscape elements.

Initial work on high-resolution seismic data east of the Elbe Palaeo Valley has revealed two larg-er submerged tributary river valley systems. These systems can be characterised as tidally influ-enced estuaries, showing fluvial, tidal, estuarine and marine deposits. This study presents a thor-ough analysis of the geomorphic and stratigraphic units in the estuaries, focusing on reconstruct-ing their spatial and temporal evolution in relation to the Holocene sea level rise. We further as-sess the preservation degree of the various deposits, with emphasis on valley margins and terres-trial facies, linking preservation degree to topography and environments, and investigating pro-cesses controlling erosion and landscape preservation.

The study contributes to our geological understanding of the eastern North Sea and how flooding affected the estuaries and Doggerland. This provides essential background for further research into human activities and adaptation to the changing landscape during the Palaeolithic and Early Mesolithic periods.

16:50 *Andreas Duus Petersen, Katrine Juul Andresen and Mikkel Fruergaard*
Evolving Coastal Landscapes: Transgressive Paleolandscape Evolution in the Eastern North Sea

During the Late Glacial and Holocene sea-level rise, the paleolandscapes of the eastern North Sea were submerged and reshaped by dynamic coastal processes. Despite their archeological potential, these submerged paleolandscapes remain largely unexplored, and the nature of their coastal evolution is still poorly understood. In this study, we investigate how a low-relief paleolandscape transitioned from land to sea, using reflection seismic- and geotechnical data from the 2,200 km2 North Sea 1 Offshore Windfarm area. We developed a conceptual model of landscape evolution, outlining the evolution from river valleys to seafloor.

Initially, large fluvial systems dominated the terrain, which gradually flooded to form low energy estuarine environments. Marine influence increased along with rising sea-levels, allowing beach systems to develop within the valleys. As the valleys fully flooded, elevated areas formed an archipelago that sheltered the inner landscapes. Eventually, full marine inundation led to erosion of the highest features and redeposition of sediments within the valleys. Our findings offer a framework for understanding the environments in which humans lived, and to identify zones of preservation and erosion – critical for interpreting submerged cultural landscapes.

17:00 *Marlen Schlöffel, Steffen Schneider, Anna Pint and Constance von Rüden*
Relative sea-level changes in the Bay of Maladroxia, southwestern Sardinia, and their implications for the pre- and protohistoric cultures

A multidisciplinary study was conducted to reconstruct the palaeoenvironmental evolution of Maladroxia Bay on the islet of Sant'Antico in southwestern Sardinia, over the past eight millennia. This study explores the palaeogeography and environment of the bay from a diachronic perspective to gain insights into the Holocene relative sea-level history, shoreline displacements and the environmental conditions during different phases. It is based on analysing sediment cores alongside a chronological model using radiocarbon dates. Four relative sea-level indicators were produced. These are the first such indicators from the early and middle Holocene for the island of Sant'Antioco. The results indicate that in the early Holocene, the area was a terrestrial, fluvial environment without marine influence. In the 6th millennium BCE, the rising sea level and marine transgression resulted in the formation of a shallow inner lagoon. It reached its maximum extent in the middle of the 5th millennium BCE. Afterwards, a gradual transition from lagoon to floodplain, and a seaward shift of the shoreline occurred. During the Nuragic period (2nd to 1st millennium BCE), the Bay of Maladroxia was very similar to how it is today. Its location was ideal for anchoring, due to the calm and sheltered conditions.

16:10–17:30 Session 30D:
Manipulated and artificial bodies of water as archaeological landscape relics

CHAIRS: *Thomas Becker and Andreas Vött*
LOCATION: U5 / 02.17

16:10 *Elena Appel, Henrik Schäfer, Thomas Becker, Markus Scholz, Dennis Wilken, Astrid Stobbe, Sarah Bäumler, Peter Fischer, Timo Willershäuser and Andreas Vött*
The Roman Landgraben canal in the northern Upper Rhine Graben (Hessisches Ried, Germany)

The transformation of the wetland region into the intensively used cultural landscape of today's Hessische Ried (Upper Rhine Graben, Germany) was a result of intensive human interference with the natural drainage system. The LandGraben project centres on reconstructing the Roman fluvioscape of the River Landgraben in the northern part of the Hessische Ried region. Geoarchaeological, archaeological and geophysical methods were used to identify and investigate silted-up sections of the Landgraben. We used radiocarbon dating, pollen analysis and diagnostic ceramic sherds retrieved from sediment cores to establish a geochronological frame. Based on our findings, it can be proved for the first time, that the Landgraben is an artificial canal constructed in Roman times. It must, therefore, be considered one of the oldest known artificial canals in Germany and the only known Roman canal on the right bank of the River Rhine. The contemporary fluvioscape of the northern Hessische Ried represents the cultural heritage of systematic water management measures that have been carried out since Roman times.

16:30 *Marcin Banat*
Canals to Nowhere? Reconstructing the lost waterways of Galindia between the Pregolya and Vistula Basins"

At the confluence of the Pregolya and Vistula river basins, in the historical region of Galindia (northeastern Poland), archaeologists from the University of Warsaw investigated (published in 2022) an early medieval stronghold at Pasym, described as "a place that gave rise to power." Within several kilometers of the site, a LiDAR survey conducted by an independent researcher revealed undocumented structures suggesting deliberate modification of natural water systems to support inland navigation. These features include: channel — a 470 m watershed cut, shoreline deepenings of 200–990 m long; parallel canals 70–120 m long; D-,U- and V-shaped embankments, double dock-like basins up to 42 × 11 m, portages with Z- and S-shaped forms 50–220 m in length. Unlike known historical drainage systems, these constructions differ in shape, cross-section, and hydraulic design, implying functions beyond land reclamation. Their close proximity to hillforts, settlements, burial mounds, and earthworks supports the idea of a broader cultural and communication network. Particularly notable is the spatial link to medieval hydronyms whose meanings align with Old Norse language, navigation, and mythology. The study examines possible prehistoric watercraft adapted to these features, reconstructs inter-basin routes, and compares them with analogous systems across Europe.

16:50 *R. Prien, F. Henselowsky, N. Hillmus, B. Jäger, E. Appel, T. Becker, B. Mächtle, U. Recker, G.J. Schenk, O. Bubenzer and A. Vött*
The River Weschnitz Fluvioscape and its interaction with the Lorsch Abbey

The River Weschnitz, a second order tributary of the Rhine system, has its origin in the Odenwald mountains and enters the Upper Rhine Graben at the city of Weinheim (northern Baden-Württemberg). Today's course in the Upper Rhine Graben is still partly naturally influenced by the Palaeo-Neckar fluvial system, but has been massively anthropogenically modified for most of its course since Roman times and especially in the Middle Ages and the Modern era. Decisive to these alterations is the foundation of the Lorsch Abbey in AD 764 that caused the emergence of new economic and political patterns closely tied to the river. Since the Lorsch Abbey and its secular successors functioned as a cultural and economic centre for the wider surroundings, humans had to cope with the naturally high groundwater table and flood events. Therefore, humans carried out river diversions, channel, dam and bridge constructions, as well as flood reduction measures and the creation of an artificial lake for fish farming. Within the framework of this collaborative research project, environmental historians, physical geographers and archaeologists work closely together on historical documents, maps, archaeological sites, artefacts and sedimentary archives in order to establish a base for reconstructing and modelling the Weschnitz Fluvioscape.

16:10–17:30 Session 7D:
Landscapes of change: data, methods, interpretations

CHAIRS: *Ylenia Paciotti and Carlo Citter*
LOCATION: U5 / 00.24

16:10 *Lasafam Iturrizaga*
Ore mining and landscape change in mountains as a driving force of early capitalism? The Harz Case Example

Mountain ranges, such as the Central European Uplands, played a significant role as economic regions due to their ore deposits. It is assumed that ore vein mining acted as a catalyst for the development of capitalist structures. One of the largest mining centers in the Early Modern Period were the Harz Mountains. Extracting ore from depths of around 1,000 meters and removing pit water posed major challenges. Overcoming these difficulties required joint capital investments and fostered technical innovations, rationalization, the division of labor, and bureaucratic structures through centralized mining authorities. Silver as a worldwide currency connected the Harz Mountains to global trade networks and economic flows. Intensive mining operations profoundly transformed the Harz landscape. Forests were cleared, the Upper Harz Water Management System, the largest energy system of its time, was constructed, reshaping the fluvial landscape, and deep shafts and mining dumps altered the morphology significantly. At the same time, the effort to overcome natural limitations fostered a more sustainable resource management. As case example serves the St. Andreasberg Mining District with the Samson Mine, one of the deepest mines at that time, in which the geoarcheological record is investigated in combination with the geological setting and the cultural history.

16:30 *Ying Liu and Antony Brown*
A case study from Lake Lednica for the Molecular Ecology of the European Medieval and Historical Landscape (MEMELAND)

provides valuable insights for contemporary landscape management and human wellbeing. The state-of-the-art sedimentary ancient DNA (sedaDNA) approach offers a molecular, high-resolution reconstruction of past landscape dynamics. Here, we present a case study from the MEMELAND project based on sediment cores from Lake Lednica in central-western Poland. The lake core sediments span the last ~2,000 years and are located near the early Polish polity's capital, with the richest Medieval archaeological remains from the previous archaeological records. Using the sedimentary ancient DNA (sedaDNA) metabarcoding method, we reconstructed how landscape composition and biodiversity responded to successive phases of human influence, including the establishment and expansion of settlements, the intensification of agriculture, and deforestation, the development of pasturelands, the rise of royal authority and military fortifications (including elite residences and bridges connecting the islands to the mainland), the adoption of Christianity in 966 CE, and the eventual collapse of the polity. This study demonstrates how sedaDNA can illuminate long-term social–ecological interactions and the legacy of human activities on landscape evolution.

16:50 *Shaddai Heidgen and Antony Brown*
Viking to Christian Landscapes (V2C): Tracing Environmental Change across the Norwegian Seas

The Viking to Christian Landscapes across the Norwegian Sea (V2C) project explores how Norse expansion, settlement, and conversion to Christianity reshaped landscapes and agricultural practices between c. 500–1500 CE. Using an interdisciplinary framework, V2C integrates sedaDNA, fecal biomarkers, and lithological analyses of lake-sediment cores from northern Norway and the Northern Isles (Orkney and Shetland). Ongoing metabarcoding and metagenomic analyses from Skail Farm and Tingwall Loch on Rousay provide the first high-resolution genomic reconstructions of Norse-period farming environments in the Northern Isles, identifying plant and animal taxa, crop introductions, and potential pathogen signatures. These datasets reveal past vegetation, crop choices, and domesticated animals, allowing reconstruction of agricultural trajectories and the resilience of farming systems during major cultural and climatic transitions. Comparative analyses between Northern and Central Norway and the Northern Isles highlight regional divergences in responses to political integration, religious conversion, and environmental stressors. The project also trials innovative methodologies, including pathogen detection and pOSL dating, broadening the environmental archaeology toolkit. Integrating archaeology, history, and palaeoenvironmental data, V2C illuminates interconnected Viking Age and medieval worlds across the Norwegian and North Sea regions, advancing debates on Norse colonisation, Christianisation, and agrarian resilience in marginal environments.

17:10 *Gylfi Helgason and Árni Daníel Júlíusson*
Changing settlement patterns in two valleys in North Iceland, 14th-19th century

Svarfaðar- and Hörgárdalur are two valleys in North Iceland. Following a population increase during the medieval period, new types of farms and shielings were established in the outfields. They were short lived and replaced by other grazing methods and settlement types during the 15th-17th centuries. Evidence suggests that these farms resemble sub-tenant farms described in Iceland's first comprehensive farm survey in 1703. This opens up an interesting issue related to class and social changes in the rural landscape.

Previous research has centred on the significance of the establishment of these farms and shielings. There has been less discussion on the meaning of their abandonment, nor has it compared the medieval settlement to the one in the 17th or 19th century or placed these changes in the context of rural capitalism.
This talk will use newly generated material produced by landscape archaeologists, historians, and palaeoecologists to discuss the settlement changes in the two valleys from the 14th century onwards. What has changed in terms of the settlement landscape? And more interestingly, what has not changed? To what extent can changes be explained by socio-economic factors, environmental changes or both?

16.10-17.30 Session 0: IALE Working group Meeting.
CHAIRS: *Rebekka Dossche*
Location: U5 / 01.18

Meeting of the International Association of Landscape Ecology

Working Group 'Historical Landscape Ecology'

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OPENING CEREMONY

+ ICEBREAKER

09:00-10:40 Session 2A:
From Point Clouds to Patterns: Machine Learning in Landscape Archaeology

CHAIRS: *Axel Posluschny , Susan Curran, Jürgen Landauer, Simon Maddison, Žiga Kokalj, Giacomo Fontana, Nejc Čož, Anthony Corns*
LOCATION: KR12 / 02.18

09:00 *Patrick Schielein, Ute Schmid, Jonas Troles and Bernd Grubert*
Application of an AI Assistant for the Analysis of Airborne Photogrammetric and Laserscanning Data of Coastal Boulder Deposits

In the Mediterranean, numerous tsunami events have been reported in historical sources. Their catastrophic impact on coastal regions was subject of many archaeological and geomorphological studies, which included sedimentary evidence like coastal boulder deposits. Such boulders can weigh several hundred tons and can be found on many rocky coasts. In recent years, many scientific discussions were led about the determination of the depositional extreme wave-events (storms or tsunamis). On Mallorca, it was shown that large boulder fields reaching up to more than 20 m above sea level were deposited by at least one tsunami during historical times. We surveyed several boulder fields on the southern and eastern coast using photogrammetric and laserscanning sensors mounted to an unmanned aerial vehicle. The resulting amount of imagery and point-cloud data was processed to digital elevation models and 3-dimensional meshs from which the boulder deposits were segmented and classified. Further analysis included the determination of parameters (dimensions, locations and orientation) for deriving transport figures and distributional patterns of the boulder deposits. In our poster, we present our initial approach of an AI assistant to analyze this dataset appropriately and to achieve our goal of establishing a characteristic signature of coastal boulders deposited by tsunamis.

09:20 *Jürgen Landauer*
“Your Landscape Talks to You”: Making AI Accessible for Landscape Archaeology through a QGIS Plugin

Foundation models such as ChatGPT have recently evolved into multimodal systems capable of processing not only text but also visual data such as images. These models can perform visual question answering, describing what appears in an image and where it is located. Recent advances now extend this capability to remote sensing data, including aerial photography, satellite imagery, and LiDAR. In a recent study we investigated whether such multimodal models can recognize and interpret archaeological features in landscape datasets. Our experiments show that they can classify features such as barrows or enclosures, identify their location, and explain their reasoning in natural language. This zero-shot capability requires no model training or dataset preparation, making it accessible to archaeologists without technical expertise. To translate these findings into practice, we have developed LandTalk.AI, an open-source QGIS plugin that integrates this functionality directly into GIS workflows. Users can select an area on the map, query the AI, and receive an archaeological feature classification with spatial and interpretative feedback. Our goal is to lower the threshold for using AI in archaeology, enabling interactive and interpretable AI-assisted landscape analysis.

09:40 *Mathias Bellat and Biel Soriano-Elias*
Water resource importance in various climatic contexts toward a machine learning approach

Water resources are often considered the most important factor, particularly in Mediterranean, semi-arid or arid climates (Wilkinson, 2003). It is thought that water shapes archaeological landscapes, particularly settlement patterns. However, it is unclear whether water is equally important in different climatic contexts. Indeed, the aridity of environments (de Martonne, 1913) can lead to different settlement pattern strategies due to variations in the availability of water resources (e.g. seasonality and intensity). Our study compares four contexts, ranging from the continental climate of the Rhine Valley (France/Germany) to the semi-arid conditions of the Simele Plain in Iraqi Kurdistan. We also compared two Mediterranean contexts: the Latium area in Italy and South Shephelah in Israel/Palestine. Furthermore, to be able to study this relationship from a chronological perspective, we compared two different time periods: the late Early Bronze Age and the Iron Age. To explore the importance of water for these four regions during these two periods, we trained a MaxEnt machine learning model with 15 covariates, 10 of which were water-related. The model's results highlighted the specific importance of some covariates for predicting settlements. They allowed us to build on previous interpretations of the importance of water resources in various climatic context.

10:00 *Lucy Killoran, Dave Cowley and John Williamson*
Not how, but why and where? AI in knowledge-creation systems for national mapping and landscape archaeology

The development of AI and ML in archaeological landscape contexts has focused on the building of technical solutions using techniques such as neural networks and, more recently, large language models. This is a necessary part of testing the feasibility of these techniques for archaeological applications. However, the limited consideration of how such applications draw from, and are sited within, knowledge-creation systems is problematic, and blocks the further development and integration of AI into coherent systems of knowledge creation. This paper presents outcomes from research which analyses the implications of integrating AI and ML techniques into traditional large area survey. In this, the drivers for survey are central, as are workflows which do not simply force AI components into survey systems. Instead, this approach recognises that the application of AI and ML tools in real-world contexts requires the careful design of pragmatic, human-centred, knowledge-creation systems.

09:00-10:40 Session 5A:
Marginal economies or economies on the margins?

CHAIRS: *Agostino Sotgia, Dario Monti, Elena Scarsella*
LOCATION: U5 / 02.22

09:00 *Agostino Sotgia, Dario Monti and Elena Scarsella*
Introduction

09:20 *Piotr Kittel, Monika Rzodkiewicz, Emilie Gauthier, Katarzyna Marcisz, Michał Słowiński, Dominika Łuców, Daniel Okupny, Mateusz Płóciennik, Jacek Szmańda, Irka Hajdas, Negar Haghipour, Yuriy Kublitskiy, Ekaterina Dolbunova and Andrey Mazurkevich*
A record of landscape evolution and human-environment relationships over the last 13,000 years in a bioarchive from the Vitebsk Lakeland

Serteya Mire is situated in the eastern Vitebsk Lakeland, on the East European Plain. It fills a small kettle hole on the surface of the fluvioglacial plain. The thickness of biogenic sediments reaches 13 m. The core chronology is based on a series of 60 radiocarbon dates. Pollen analysis results document that pine dominated in the Allerød, followed by spruce and birch in the Younger Dryas. During the Holocene, the importance of deciduous trees increased. Spores of coprophilous fungi indicate the presence of large herbivores in the Allerød, and possible grazing or the entry of wild animals in the Middle and Late Holocene. Diatom analysis results confirm significant changes in water level and trophy of the paleolake. The highest diatom abundance was in the Late Vistulian. The reservoir waters were generally quite clean and moderately fertile. The transformation of the lake into a poor fen and into a raised bog is clearly evident in the lithology and the nature of the studied proxies. Testate amoebas analysis results indicate water level fluctuations in the peat bog during the Neoholocene and human impact increasing over the last 600 years. Study is financed by grant from the „National Science Centre, Poland“ (No. 2021/41/B/HS3/00042).

09:40 *Peter Attema, Antonio Larocca, Wieke de Neef and Luigi Bloise*
Landscape archaeology above the settled zone: a view from the Pollino Archaeological Landscape Project (South Italy)

We present a multidisciplinary landscape archaeological project in the Pollino mountains (south Italy) aiming to study the long term human frequentation of this geologically diverse landscape and its impact on the natural environment. Beyond the main mountain trails, the team explored patches of rough pasture, upland grazing areas and accessable forested areas to collect artefacts and to record the drystone structures of transhumant herders and charcoal burners. Soil exposures were recorded and sampled and cores taken for palaeoecological analysis. In our paper we will start out by giving an overview of the results in terms of the traces and impact of human frequentation from prehistory up to the recent past. Next we will discuss the interpretive challenges of the data collected and how they may be connected with the archaeology of the surrounding uplands and lowlands. In 1988 the Pollino mountains became a national park and traditional economic uses, like transhumance, were aborted. In 2015, the park was recognized as a Unesco Global Geopark. We reflect on how the changed perspective on the Pollino mountains from economic space to nature reserve impacted on its interpretation as a marginal zone, and how landscape archaeology can help to correct such views.

10:00 *Mette Løvschal, Anne Birgitte Nielsen and Michelle Farrell*
Expanding the margins: Natural and anthropogenic drivers of heathland establishment and persistence in postglacial Northern Europe

Calluna heathlands have often survived for several millennia in postglacial Northern Europe, being some of the most persistent inter-regional ecologies known from late prehistoric times. They are a classic example of a ‘marginal’ environment, often viewed as unproductive wastelands, and their value to prehistoric communities is not widely recognised. As such, there exists a series of unresolved questions relating to how and why people managed to sustain these deeply unstable ecologies for >5000 years. Here we aim to understand the deep-time dynamics of Calluna heathlands, particularly distinguishing between naturally occurring heather and anthropogenic heathlands which thrive under human-induced disturbances including grazing and fire. We focus on a selection of regional case studies of the ‘periphery’ of Northern Europe, including the sandy soils of Western Jutland, Southwestern Norway, and Southwestern Britain. We use pollen-based land-cover reconstructions to investigate the establishment, geographical expansion, and deep-time persistence dynamics of heathlands across Northern Europe (10 ka BC–present). Their evolution follows multiple trajectories that cannot be explained by climate or geology alone. Rather, our analyses point to the importance of a series of factors pertaining to social organisation as well as entrapment dynamics, unique to these landscapes.

10:20 *Guillem Salvador-Baiges, Ferran Antolín and Ermengol Gassiot-Ballbè*
Beyond seasonal herding landscapes: agricultural potential and settlement dynamics in the Central Pyrenees during the Neolithic (5600–2100 cal BCE)

Mountain areas have traditionally been considered as areas with marginal economies and seasonal uses for pastoralism. The central Pyrenees, with their rugged topography and high mountain condition, have long been considered a “natural” area or one with little anthropogenic impact, but this conception is beginning to change thanks to research projects developed in recent decades, which have provided data that challenge the idea of mountains as marginal areas.This study re-evaluates these hypotheses by contextualizing the spatial distribution of Neolithic sites (5600–2100 cal BCE) to examine settlement dynamics and land use strategies. Using GIS, we process paleoclimatic and orographic variables to characterize the occupation pattern and model the agricultural potential of the region. We focus on three main crops (wheat, barley, and peas) and four proposed agricultural systems for the Neolithic in Europe (intensive mixed, extensive, floodplain, and slash-and-burn) to assess the viability and suitability of agriculture in these mountain environments. The results reveal two main occupation patterns: early settlements (5600–3300 cal BCE), mostly located between 1000 and 1700 m a.s.l, close to crop growing areas, show mixed agro-pastoral economies, while later occupations (3300–2100 cal BCE) are located above 2000 m a.s.l, suggesting a greater emphasis on pastoralism.

09:00-10:40 Session 12A:
Abrupt Environmental Change of Human-Environmental Systems in the Sedimentary Records

CHAIRS: *Ayaka Nguyen, Sara Saeidi, Stefan Dreibrodt, Giulia Di Giamberardino*
LOCATION: U5 / 00.24

09:00 *Ayaka Nguyen, Sara Saeidi and Stefan Dreibrodt*
Introduction

09:15 *Stefan Dreibrodt*
Holocene extraordinary precipitation events and extreme erosion in Europe: records, chronology, and significance

Extreme erosion is triggered by extraordinary precipitation events as in the valley of the Ahr in 2021. Since these dangerous processes leave traces both in people's memories and in the landscape itself, we have the opportunity to reconstruct their occurrence in the past. Various types of written sources are suitable for investigating extreme precipitation events, their perception, and their social consequences in the recent past. Typical geomorphological landforms and sediments in the landscape itself enable long-term reconstructions, but these provide less information about the social impacts. The talk summarizes the history of Holocene extreme erosion events in Central and Southeastern Europe and shows that these extreme rains are embedded in long-distance connections within global climate systems. Open questions for future research include a comprehensive understanding of 1) the social consequences of extreme erosion in the Holocene, e.g., for the development of future sustainable risk reduction strategies, and 2) the mechanisms of the climate system, e.g., for the development of early warning systems.

09:35 *Lena Slabon, Benedict Thein, Sarah Bäumler, Birgitta Eder, Peter Fischer, Hans-Joachim Gehrke, Erophili-Iris Kolia, Franziska Lang, Georg Pantelidis, Oliver Pilz, Dennis Wilken, Timo Willershäuser and Andreas Vött*
Flood-induced landscape changes in Olympia (Greece) and its surroundings: Sedimentary evidence of high-energy events

Ancient Olympia, located at the confluence of the Kladeos and Alpheios Rivers in the western Peloponnese (Greece), was used as a venue for the Panhellenic Games from Archaic times until the 4th century AD. Sedimentological and stratigraphic investigations brought to light a large palaeolake in the direct environs of the sanctuary. The Lake of Olympia existed from the mid-Holocene to the medieval period. Within its fine-grained lacustrine sediments, several coarse-grained intercalations indicate episodes of high-energy flooding. We were able to identify and date seven distinct flood events that affected the ancient site, the lake, and its surroundings. These events appear to be linked to regional tectonic activity (RTE), which triggered secondary effects such as tsunami landfalls along the Gulf of Kyparissia and enhanced fluvial or slope processes in the Alpheios and Kladeos catchments. In the Olympia region, high-energy flood events were found to have significantly influenced Holocene landscape development by altering lake levels. Furthermore, flood deposits south of the sanctuary suggest that earthquake-induced landslides in the marly bedrock of the Kladeos Valley played a major role in the sedimentary burial of Olympia. These landslides likely dammed the valley, creating temporary lakes that later burst and flooded the site.

09:55 *Josu Narbarte, Eneko Iriarte and Manex Arrastoa*
Sudden floods, shifting landscapes: human responses to rapid environmental change in Roman Iberia

This contribution addresses short-term environmental and social disruptions in Roman Iberia through a geoarchaeological study of the central Ebro basin (Navarre, Spain). Different contexts register evidence of abrupt hydrological and geomorphological changes during the 2nd–3rd centuries CE, coinciding with a broader phase of climatic instability and social contraction in the western Mediterranean. Stratigraphic and geochemical analyses (XRD, XRF, LOI, PCA) reveal rapid shifts from stable fluvial deposition to episodes of enhanced erosion, colluviation, and floodplain aggradation. These events correlate with the abandonment or reorganisation of local hydraulic and productive infrastructures, suggesting a direct feedback between environmental stress and settlement dynamics. The integrated interpretation of archaeosedimentary and archaeological records enables the identification of discrete depositional events—possibly linked to short-lived flooding episodes—that redefined local landscapes and conditioned subsequent human occupation. By foregrounding the sedimentary signature of these abrupt transitions, this case study contributes to the methodological discussion on how high-resolution geoarchaeological data can capture the imprint of rapid landscape transformations, bridging natural and anthropogenic processes within Late Holocene socio-environmental systems.

10:15 *Martin Miňo, Martina Moravcová, Peter Pauditš, Malvína Reiffers Čierniková and Tibor Lieskovský*
A natural disaster or a complex human-environment interaction. A case study from the Štiavnické Vrchy Mts. in Slovakia

The interaction between humans and their environment has always been a key force shaping both natural and cultural landscapes. High-resolution airborne laser scanning (ALS) data provide an effective tool for assessing the environmental impact of past human activities and, conversely, the influence of environmental processes on human communities.

An illustrative example is the Mt. Sitno hillfort (1006 m a.s.l.) in the Štiavnické vrchy Mountains, which likely served as a regional center in the past. A massive landslide on the mountain's slopes offers an excellent case study of human–environment interaction. The stratigraphy of this event reveals a complex relationship between human activities that preceded the disaster and those that followed it.

Chronological evidence suggests that the landslide may have been triggered by anthropogenic factors. But was it truly of human origin? And if so, which specific activities caused it, and how did it affect the local community and environment?
To explore these questions, we applied ALS data interpretation, ground survey, sediment coring, underwater exploration, targeted micro-trenching, and geological and palynological analyses.
This work was supported by the Slovak Research and Development Agency under the Contract no. APVV-22-0151.

09:00-10:40 Session 9A:
Settlement dynamics in floodplain landscapes

CHAIRS: *Iris Nießen, Martin Offermann, Jens Schneeweiß, Johannes Schmidt, Alexander Voigt*
LOCATION: U5 / 01.22

09:00 *Iris Nießen, Jens Schneeweiß, Martin Offermann, Johannes Schmidt and Alexander Voigt*
Settlement Dynamics in Floodplain Landscapes. An Introduction to Key Themes and Perspectives

This introductory talk opens the session "Settlement Dynamics in Floodplain Landscapes" and provides an overview of key themes, concepts, and research perspectives on the devel-opment of settlements in floodplain environments. It outlines long-term trends and patterns of settlement formation, relocation, and continuity within floodplain landscapes—from pre-history to the modern era. The lecture highlights how settlement dynamics have been shaped by geomorphological processes, hydrological variability, and socio-economic change. Central to this discussion are the processes of emergence, relocation, and abandonment of settlements as expressions of broader cultural and landscape transformations. The presentation defines the thematic framework of the session and formulates key open research questions. In doing so, it establishes the conceptual and comparative foundation for the session and invites an interdisciplinary dialogue on the spatial and temporal dy-namics of settlements in floodplain landscapes.

09:20 *Václav Fanta*
Settlement relocation after flooding: how long do people remember the disaster?

According to various papers, when a flood or wetter times came in the past, people usually moved their settlements to higher positions in the landscape or at least stopped to build new houses in the dangerous floodplain. This process has been documented in various part of the world. But how long did they stay in the safer places? And did they pass this knowledge to younger generations? When dealing with such "flood memory", a key-question is how long a community can keep information: how long after a flood are people still settled in a higher or safer place and when they begin to settle backwards near the river? We tested a set of empirical data on 1293 settlements founded in the course of nine centuries, during which time seven extreme floods occurred. For a period of one generation after each flood, new settlements appeared in safer places. However, respect for floods waned in the second generation and new settlements were established closer to the river. We conclude that flood memory depends on living witnesses and fades away already within two generations. Historical memory is not sufficient to protect human settlements from the consequences of rare catastrophic floods.

09:40 *Erwin Meylemans*
The evolution of the river Scheldt (Belgium) and human occupation dynamics from the late Mesolithic to early Bronze Age

The lower Scheldt valley (Flanders, Belgium) has been the subject of numerous multidisciplinary studies and surveys, including geomorphology, palaeoecology, and archaeology, among others. Much of this work has been conducted in the context of flood-risk management and nature restoration projects. These studies reveal, with increasing resolution, the complex interactions between the evolution of the alluvial environment and patterns of human occupation throughout the Lateglacial and Holocene periods. This presentation focuses on a key period of interest, spanning from the Late Mesolithic (ca. 5000 BC) to the Early Bronze Age (ca. 2000 BC). Within this timeframe, the combined data demonstrate major transformations in the alluvial plain environment (including rising groundwater levels and the development of extensive alder carr forests), as well as shifts in settlement dynamics—most notably the transition to agriculture—and in the ways humans exploited the riverine landscape.

The available evidence suggests that these environmental changes were likely a significant trigger for transformations in human settlement dynamics, not only on the economic level (e.g. the shift to agriculture), but also on other levels, such as the 'religious' or ritual experience of the river landscape.

10:00 *Fabian Benedict and Wolfgang Neubauer*
Living with a restless river: Settlement dynamics and environmental change in the March floodplain over 7000 years

Floodplain environments rank among the most dynamic cultural landscapes, shaped by highly mobile river channels and long-term human activities. In the lower March valley (Austrian-Slovakian border), the interplay of fertile soils, fluctuating hydrology and geomorphological changes has influenced settlement strategies for more than 7000 years. This study integrates archaeological site data with GIS-based analyses of topography, pedology and hydrology to examine how communities balanced opportunities and constraints within this fluvial system. Results indicate a sustained attraction to the floodplain, where slightly elevated, sandy soils offered both agricultural productivity and relative security from flooding, contributing to remarkable diachronic continuity of occupation. Nevertheless, settlement behaviour changed significantly: medieval communities increasingly shifted toward higher terraces, responding to heightened flood risks and intensified anthropogenic modification of the March River. These long-term dynamics reflect the emergence of a "Fluvial Anthroposphere," in which human agency progressively reshaped the floodplain itself. By demonstrating how micro-scale environmental variability conditioned settlement choices over millennia, this case study contributes to wider discussions of adaptation, land-use strategies and water management in European floodplains. The findings highlight the analytical potential of GIS-based spatial modelling for reconstructing settlement dynamics in complex hydrological landscapes.

10:20 *Hannah Lindemann, Astrid Stobbe, Sascha Scherer, Sabine Fiedler, Nadine Nolde, Tanja Zerl, Stefan Suhrbier, Astrid Röpke and Silviane Scharl*
Middle Neolithic Wetland Grazing Strategies in the Wetterau (Central Germany) – An Integrated Multi-Proxy Study

Floodplains are important grazing areas, providing productive and seasonally resilient pastures within dynamic river landscapes. However, it is unclear since when they have been used for this purpose. This study examines a sediment archive from a floodplain in central Germany (Berstadt/Wetterau). By combining pollen, faecal lipid biomarkers (Δ5-sterols, stanols and secondary bile acids) and dental abrasions, we can reconstruct land use and animal husbandry during the Neolithic period, focusing particularly on the use of floodplains. Following the end of the Early Neolithic Linear Pottery Culture in the 5th millennium BC, pollen records indicate increased human activity in the Middle Neolithic Rössen Culture (4750/4700-4600/4550 BCE), including reduced tree cover, increase of cereals and a significant expansion of grasses, presumably driven by grazing. Spores of coprophilous fungi and elevated 5β-stanol concentrations suggest that livestock farming existed in the floodplain. The ratio of stanols to bile acids indicates the presence of ruminants and pigs in the floodplain, which is supported by zooarchaeological evidence and dental abrasion patterns from the archaeological site. This multi-proxy evidence demonstrates the deliberate integration of floodplain wetlands into Neolithic land use systems at least since the Middle Neolithic period.

09:00–10:40 Session 25A: Past and Present Perspectives on Geopolitical Landscapes

CHAIRS: *Eduardo Herrera-Malatesta, Jesus García-Sánchez and David González-Álvarez*
LOCATION: U5 / 01.17

09:00 *Eduardo Herrera-Malatesta, Jesus García-Sánchez and David González-Álvarez*
Introduction to the session

09:20 *David González-Álvarez*
Archaeological research in the Cantabrian Mountains (NW Spain) to explore the geopolitical foundations of the European landscapes during the Modern and Contemporary periods

As other European mountainous regions, the upland pastures of Babia (León, Spain) in the Cantabrian Mountains have been exploited by pastoralist groups since Late Prehistory. These landscapes have been shaped by long-term human activity; archaeological research allows us to understand these processes. Contrary to the common perception of upland regions as wild or peripheral areas, distant from the centres of historical inquiry on Big History, our ongoing investigations in Babia illustrate how research programmes on Landscape Archaeology illuminate global geopolitical processes such as modernization, world trade, and human adaptation to climate change. Indeed, pastoralist activities in the study area have been instrumental in sustaining the production of raw materials such as wool and meat, which are fundamental to the national economy and its international relations during the modern and contemporary periods. This paper assesses changes and continuities in settlement patterns, the scale of herding production, and seasonal modes of transhumance. We analyse archaeological and paleoenvironmental datasets in this region in order to correlate changes and continuities in the socio-environmental relations established by local communities and their surrounding environs with both local and global historical dynamics. European mountainous landscapes have been shaped significantly by global geopolitics.

09:40 *Cecilia Magdalena Arganaraz*
From Water Wars to Desert: Power and Water in Catamarca, Argentina.

This presentation summarizes the findings of a long-term research project in Catamarca, Argentina, addressing a topic of significant importance to both archaeologists and geographers: water management and its centralization as an indicator of social and spatial inequality. We adopt a water-centered perspective to examine the history of a specific basin and its adjacent region. This approach explores how different modes of water distribution and management facilitated long-term Indigenous resistance against Spanish colonization, as well as more recent conflicts arising from increasing centralization and hierarchization of water infrastructure. Our goal is to construct a history shaped by the materialities of water, power dynamics, and resistance. Conducting a socio-natural history necessitates a longue-durée approach. For this presentation, we have selected three pivotal events to discuss the evolving relationships between water, landscape, and power: the Calchaquí Wars (17th century), the foundation of a colonial city (18th century), and the construction of a dam (20th century). Through these, we aim to illustrate significant changes and continuities in how the people of Catamarca have both built and contested power through water.

10:00 *Grzegorz Kiarszys and Marek Lemiesz*
27 Days of Russkij Mir in Yahidne: The Material Legacy and the Landscape of a War Crime

Yahidne, a village near Chernihiv in northern Ukraine, became the site of grave atrocities during the early phase of the 2022 Russian invasion. On 3 March 2022, Russian troops occupied the village and confined over 350 civilians in the cramped basement of the local school, which was converted into a temporary garrison and prison. Deprived of light, air, and basic necessities, the captives endured extreme conditions that led to numerous deaths. After 27 days of occupation, Russian forces withdrew, leaving behind extensive material evidence—abandoned belongings, military items, half-eaten military rations, cigarette butts, and other discarded materials. The prisoners left their mark on the basement—children's wall drawings, makeshift calendars, and inscriptions bearing witness to those who died. These remnants, along with traces of fortifications and destruction in the surrounding landscape, provide a tangible record of the atrocity. In 2023, the site was digitally documented through a Ukrainian-Polish initiative that produced detailed 3D scans, CAD plans, and photographic records. Today, Yahidne stands at the centre of debates on commemoration and memory. Plans to transform the former school into a museum illustrate how digital documentation can support both the preservation of evidence and the creation of heritage from sites of trauma.

10:20 *Jesús García Sánchez*
Late Iron Age geopolitical landscapes, social control and connectivity

This paper examines various models for reconstructing Late Iron Age society from a landscape perspective in Central Iberia, primarily the Duero basin. Thanks to new data on Iron Age oppida, and social data from necropolis and geospatial data as geophysics, the paper aims to propose new models about how territory and landscape were organised and how different cultural groups negotiated the landscape with instruments that broke the isolation of the large oppida, for instance, pacts or oaths between individuals and communities that enabled far-distance connectivity. We will use data from aerial and geophysical surveys carried out recently in the northern side of the Duero river, field surveys around the oppidum of Castarreño (Olmillos de Sasamón) and the secondary settlement of El Espinillo (Villadiego) and environmental data from coring at the foothills of the Cantabrian Mountains, that could shed light on how landscape around the large oppida was exploited, and proxies to reconstruct the social pyramid, and the role of elite to model large territories at the same time that social control was enforced within oppida and hillforts.

09:00–10:40 Session 23A: Geospatial Analysis in Archaeological Heritage Management

CHAIRS: *Marc Miltz, Philipp Hagdorn and Stefanie Dr. Berg*
LOCATION: U2 / 01.33

09:00 *Stefanie Berg, Philipp Hagdorn and Marc Miltz*
Introduction to Session and relevant examples of work from the Bavarian State Office for Monument Protection

09:20 *Casandra Brasoveanu, Andrei Asandulesei and Radu-Alexandru Brunchi*
Geospatial Big Data for Bronze Age Heritage Management in the Jijia Hills (NE Romania)

The Jijia Hills region, found in NE Romania, benefits of an exceptional density of archaeological sites belonging to the Bronze Age: 1791 burial mounds (most of which were erected during Early Bronze Age) and 362 settlements belonging to Noua culture (Late Bronze Age), most of the latter featuring ashmounds (20-30 m, quasi-circular grey spots, visible on the soil surface). Unfortunately, despite their cultural significance, many of these sites remain undocumented and are critically endangered by anthropic and natural factors. This study demonstrates how large-scale geospatial analyses of archaeological big data enhance the identification, documentation, and preservation of these vulnerable heritage assets. High-resolution remote sensing techniques, including LiDAR and aerial photography, were critical in detecting, precisely pinpointing, and characterizing this vast number of previously unrecorded or inaccurately mapped sites. Integrating these datasets with geophysical surveys (e.g., magnetometer survey, electrical resistivity, ERT) provides crucial information on site micro-morphology, internal features, and chronology. This preventive heritage management approach, leveraging advanced spatial assessment, refines spatial modelling of site distribution, reveals patterns of landscape use, and supports informed decision-making. The research highlights the essential role of data-driven, non-invasive geospatial technologies in mitigating the ongoing loss of these Bronze Age archaeological landscapes.

09:40 *Shubhi Mishra*
Mapping Ancient Water Management in Gujarat: An Epigraphic and Geospatial Analysis

State of Gujarat's (Western India) geography is defined by diverse arid and semi-arid landscapes, ranging from the saline deserts of Kachchh to the rocky plains of North Gujarat, where limited surface drainage makes groundwater a vital resource. The volcanic plateaus of Saurashtra add further variation, while Central Gujarat's fertile alluvial plains contrast with the humid coastal belt of the south. This study investigates Gujarat's historical water-management systems (2nd century BCE to 12th century CE) through the integration of inscriptional data and geospatial analysis. Epigraphic records mentioning wells, canals, stepwells, and moats are compiled from sources such as Epigraphia Indica, Select Inscriptions, and Indian Antiquary to build a database representing different historical periods. These data are analyzed in spatial and temporal contexts using GIS platform. To assess landscape changes caused by later developments, selected regions are examined using old maps, CORONA satellite imagery, SRTM DEM (30 m), and lithological datasets. The study highlights Gujarat's rich water-management heritage and emphasizes the documentation and preservation of neglected or endangered historical water bodies. It also identifies the loss of topographical integrity and disconnectivity due to unplanned modern development and suggesting to preserve ancient structures with surrounding landscapes to support sustainable water management.

10:00 *Eltjana Shkreli, Zhaneta Gjyshja and Liridona Ura*
Tradition and Transformation: Spatial Analysis of Kelmend's Settlement Patterns Through Time

This presentation examines the evolution of settlements in the Albanian Alps over time. Specifically, we focus on the Kelmend area, inhabited by the Kelmend tribe, known for its bravery and pastoral traditions. The Kelmend tribe has long inhabited the Cem River valley in northern Albania, building stone houses and practicing agriculture and herding. However, the timeline and the characteristics of changes in their settlement patterns are poorly understood.

This talk presents an initial analysis of settlement areas, spatial organization, and changes in settlement patterns in Kelmend. We use modern administrative borders as the study area, and it encompasses an area of 384.5 km², comprising eight rural settlements. To address these questions, we utilize spatial analysis with ArcGIS, specifically employing point mode spatial analysis and neighborhood analysis, and examine historical archives and archaeological survey evidence to understand settlement distribution and change over time.

In addition, this research uses archaeological data and spatial developments in the Cem Valley and Kelmend, intending to inform heritage preservation, landscape history, and future landscape planning in this remote region.

09:00–10:40 Session 26A:
Spatial Approaches to Bronze Age Landscapes in the Mediterranean: Linking Archaeological Theory and Quantitative Methodology

CHAIRS: *Davide Schirru, Matteo Alessi, Alessandro Vanzetti, Emily Holt*
LOCATION: U5 / 02.17

09:00 *Davide Schirru*
Introduction

09:20 *Elizabeth Ridder, Suzanne E. Pilaar Birch, Steven E. Falconer and Patricia L. Fall*
18O Isoscapes for Cyprus and Jordan: Baselines for Bronze Age Mobility and Agriculture

Spatial modeling of point-based, modern isotope signals to create isotopic landscapes (isoscapes) provides the baseline for extrapolating ancient isoscapes from archaeological contexts. Existing isoscape maps, however, are often too coarse to distinguish between settlements in the eastern Mediterranean. We compile long-term precipitation records and surface- and ground-water datasets to build 1-km-resolution precipitation isoscapes for Cyprus and Jordan. We compute precipitation-weighted means, reconstruct local meteoric water lines (the δ2H–δ18O relationship), estimate d-excess, and interpolate surfaces, validating them against water sources.

We use modern baselines to frame ancient isoscapes for Bronze Age contexts, enabling inferences about water sources, mobility, and agricultural practice when combined with faunal isotope data from Politiko-Troullia, Cyprus, and Tell el-Hayyat, Tell Abu en-Ni'aj, Jordan. The project provides a transparent, testable foundation for evaluating climate–society hypotheses, such as settlement change across the Early Bronze IV–Middle Bronze transition, at scales in which communities lived and farmed.

09:40 *Alexandre Valette*
Modelling Mycenaean Roads in the Argolid through GIS and Historical Cartography

The study of Mycenaean roads has attracted scholarly attention since the earliest excavations in the Argolid (Peloponnese, Greece), which revealed engineered roadways around Mycenae. Subsequent research has primarily focused on the function of these routes and on the capacity of Bronze Age Mycenaean states to control extensive territories through a well-developed transport network. Numerous roads once traversed the Greek landscape, connecting palaces, settlements, cemeteries and sanctuaries. However, due to continuous urbanisation and the subsequent re-use of these pathways, tangible remains are now mostly preserved in the mountainous areas surrounding the principal centres of Mycenaean culture.

Recent studies have highlighted the potential of Geographic Information Systems combined with least-cost path analysis, drawing on mobility studies and historical cartography, to reconstruct these ancient networks.

This paper proposes to apply this approach in conjunction with field surveys and the examination of archaeological evidence, with particular attention paid to slope and topographical factors around Mycenae and the Argive plain. The comparison of historical maps further refines the results. In the long term, this methodology aims to be extended to other regions of Greece, where the remains of Mycenaean roads were discovered in a more scattered manner.

10:00 *Helen Dawson, Giuseppina Battaglia, Nunzia Larosa, Alessandra Magri, Claudia Speciale and Giacomo Vinci*
A Fortress in the Sea: Spatial Approaches to Early Bronze Age Settlement on Ustica Island (Sicily)

Our research at the site of Culunnedda on the island of Ustica (north of Sicily) investigates the development of Early Bronze Age settlement (ca. 2300–1500 BCE) in its wider landscape. Situated on the island's highest interior plateau, Culunnedda commands extensive views over Ustica and the adjacent Sicilian coastscape. Our recent LiDAR and fieldwalking surveys have revealed a substantial rampart about 4 m wide, enclosing roughly 0.4 hectares with dense concentrations of Early Bronze Age pottery, pointing to a fortified settlement. A possible outer enclosure extending over 7 hectares, encompassing an Early Bronze Age cemetery already excavated in the 1970s, hints at a multi-scale, defensive, and socially complex landscape. These results inform forthcoming Ground-Penetrating Radar surveys, targeted excavations, and environmental reconstructions. Integrating spatial analyses of geomorphology, visibility, and movement with interpretive perspectives from Landscape and Island Archaeology, our study examines how defense, mobility, and inter-island connectivity structured daily life, territorial control, and connections between the island and the broader region. The project contributes to debates on Bronze Age Mediterranean landscapes and the role of small islands in networks of social and environmental transformation.

09:00–10:40 Session 27A:
In the grip of resources: Human presence in harsh environments – A case for the concept of the "resource-scape"?

CHAIRS: *Aydin Abar and Elena Silvestri*
LOCATION: U5 / 01.18

09:00 *Aydin Abar and Elena Silvestri*
Introduction

09:20 *Brian Stewart and Sam Challis*
Environmental flux and supernatural resource control among mountain foragers: the Neoglacial in highland Lesotho, southern Africa

Understanding past strategies for obtaining resources usually revolves around the economic and tangible, for good reason since these are central to human livelihoods. This reflects the concerns of 21st century Westerners more than those of people in the past, whose worlds were less clearly divided between the material and the spiritual. For small-scale societies, dealing with environmental flux and the mediation of the forces, human and nonhuman, controlling resources is paramount for maintaining socioecological balance. To investigate how people imbued their landscapes with meaning we must examine their systems of resource control, spiritual and physical. Here we present a series of dynamic environmental, subsistence and ontological changes in southern Africa's highest mountains, the Maloti-Drakensberg. Coupling excavated and environmental evidence with direct dates for rock paintings, we then interrogate them using the region's rich ethnography to illuminate people's resourcescape during the late Holocene Neoglacial (~3.5–2 kcal BP). We argue that as game declined and hunting windows narrowed, foragers sought to manage scheduling and social conflicts through enhanced spiritual negotiation with nonhuman entities in the landscape. Facilitated by the supernaturally-charged nature of their elevated cosmos, this intensified spiritual labour may have found material expression in an elaborate new style of painting.

09:40 *Henry Chapman, Morten Fischer Mortensen, Michelle Farrell, Nina Helt Nielsen, David Smith, Peter Steen Henriksen and Peter Friis Møller*
From resource-scapes to sacred landscapes: the re-use of peatlands in prehistory

In areas of north-west Europe where woodland was a scarce resource, the exploitation of peat for fuel can be traced back to at least the Bronze and Iron Ages. However, archaeological evidence from many of these same landscapes indicates the re-use of earlier peat cuttings as sites of votive deposition, and in some cases even sites of execution. In this paper we will explore the evidence for ancient peat cutting in Danish bogs, alongside evidence for the later deposition of sacred objects – and in some instances, human bodies – within the same peat cuttings. Did these startlingly different activities take place concurrently? Or can we perhaps see a shift in perception from resource-scape to sacred landscape? How do different interpretations of acts of deposition in these landscapes affect our understandings of the economics surrounding prehistoric peat extraction?

10:00 *Manfred Böhme*
Patterns of transhumance. Archaeological evidence on Oman Mountains from prehistory until sub-recent times

Many parts of Oman are characterised by mountains of high altitudes. Various ecological zones provide a source of biodiversity, which provokes the integration of remote areas into the economic sphere of societies. Apart from seasonal shifting of herdsmen, transhumance covers much more resources than only pastures, e.g. gathering activities. Due to temporary use and very short stays on higher altitudes, the remains of occupation are not much present and hiding from our first view. Therefore, the study of dwellings from sub-recent and Islamic times is helpful to find out older settlement structures. Rather than settlement structures and graves, indications of path-way networks are detectable. In particular resting places and lithic finds attest the prehistoric tradition of the recorded migration routes. The observation of more recent remains alongside the pathways is useful to understand the function of hitherto unclear appearances. Various objects contribute to our knowledge concerning human long distance walks. This vanishing heritage has produced features leading to universal comparability.

10:20 *Michele Dinies, Arnulf Hausleiter, Alina Zur, Andrea Intilia, Frank Darius, Philipp Hoelzmann, Viola Podsiadlowski and Reinder Neef*
Tayma Transformed: The development of oasis agriculture in North-west Arabia

Humans were always attracted by natural oases in desert and semi-desert environments. In the northern Sahara or in the Arabian Peninsula, most of the oases are nowadays intensively cultivated. The reconstruction of the gradual transformation of the ancient natural oasis of Tayma, north-west Arabia, into a horticultural system and, at last, a date-palm oasis, is based on the analysis of botanical remains (pollen, fruits, seeds) from four fruit trees: date palm (Phoenix), pomegranate (Punica), fig (Ficus) and grape (Vitis). Grapes and figs were introduced into the ecosystem of these oases around 6,600 years ago, while plant taxa such as date palms and pomegranates appeared much later (3,000 years ago), even though they had been cultivated in neighbouring regions before. At the same time, the dromedary is attested for the first time at Tayma, and contacts to Egypt are evidenced in the archaeological record. The active transformation of a natural oasis is understood as equivalent to that of a natural landscape into a biotic resource landscape impacting the (local) ecosystem. While the agents (humans) are clear, the triggers for these particular dynamics – socio-cultural and climate, will be closer investigated, including additional palaeo-botanical data from the Saharo-Arabian region.

09:00-17:30 Session 5I:
Poster session Day 2

LOCATION: KR12 / 00.16

Angela Paolini and Federico Fasson
Shaping the Waterscape at the edge: case study on the South Suburbium of Rome (Poster)

Within the boundaries of the Regional Park of the Appia Antica, a significant portion of the Campagna Romana is preserved, representing a remarkable example of a rural landscape today. This contribution focuses on the Almone River basin, located in the southern suburban area of Rome, analyzing the historical landscape through the complex and varied diachronic relationship between hydrography, natural environment, and human settlement patterns, with particular attention to human interventions related to water management and utilization. Following the methodological guidelines of Landscape Archaeology, the study was conducted through a multidisciplinary and multiscalar approach, aimed at achieving a holistic understanding of the landscape and an integrated interpretation of it. The research objectives were achieved through the analysis of historical-cartographic archival documents aimed at the historical reconstruction of the territory, the selection of specific representative areas for detailed examination, and the execution of surveys using precision technologies such as DGPS, photogrammetry, and LIDAR. These technologies enabled the creation of high-resolution mapping of the landscape, both in its natural components, through the generation of digital terrain models, and in its anthropogenic modifications, through the detailed mapping and surveying of various types of structures.

Petra Basar and Bryan Hanks
Multi-Method Non-Invasive Approaches to Community Organization in Twin-Circle Settlements, Late Neolithic Southeastern Europe (5th Millennium BC)

Twin-circle settlements represent a distinctive form of community organization in Late Neolithic Southeastern Europe. Despite their prominence, their internal layout and social dynamics remain poorly understood due to the limitations of excavation and preservation. This paper presents the results of a multi-method non-invasive study of selected twin-circle sites in the Drava–Sava interfluve, middle Danube basin, dating to the 5th millennium BC. We combined geophysical prospection (frequency domain electromagnetic induction, magnetometry, surface magnetic susceptibility) with UAV-based remote sensing and satellite imagery, supported by targeted surface surveys, to reconstruct settlement layout and spatial organization. Preliminary results reveal concentric habitation zones with distinct internal divisions that suggest structured social organization and collective planning. Multidimensional statistical analyses in QGIS integrate geophysical results to generate multi-channel composites. These datasets refine identification of ditches, house floors, and activity zones, directly informing analyses of internal organization and functional differentiation between paired enclosures. The integration of multiple datasets allows nuanced interpretations of household clustering, activity areas, and the role of enclosure systems. By demonstrating the potential of non-invasive approaches, this study advances understanding of Late Neolithic settlement patterns and contributes to wider debates on community organization, social differentiation, and the use of space in prehistoric Europe.

Dario Monti and Elena Scarsella
Grazing Landscapes: Modelling Pastoral Areas in the Central Apennines during the first millennium BC

Mountain environments of the Central Apennines have long been regarded as marginal within the socio-economic frameworks of ancient Italy. This perception, rooted in an urban-centric bias, has often reduced their role to that of either isolated areas or peripheral hinterlands serving the lowlands. Within this paradigm, pastoralism has traditionally been assumed to represent the only viable economic activity in such rugged landscapes. While herding indeed constituted a major economic pillar, this reductionist view conceals the complexity of mountain economies and their integration within broader regional systems. This paper presents a GIS-based modelling approach aimed at reconstructing the potential distribution and extent of ancient grazing areas through land-suitability analysis. By integrating topographic, climatic and environmental variables, the model aims to assess the spatial logic of pastoral exploitation during the first millennium BC, providing a quantitative framework to discuss its social and economic implications. Finally, ethnoarchaeological comparisons are employed to explore the continuity of pastoral structure, land-use patterns and forms of economic integration, linking modern evidence to the fragmentary archaeological record. The resulting model contributes to a renewed understanding of Apennine landscapes as dynamic and structured environments, rather than residual or marginal spaces within ancient Italy.

Jens Schneeweiß, Yasmin Dannath, Ingunn Holm, Wiebke Kirleis, Natalia Riabogina and Stig Welinder
Uncovering Landscape Change and Migration: The Forest Finns' Swidden Heritage

From 1580 onward, the Forest Finns migrated into the boreal forests of the Sweden–Norway border region. They brought with them their slash-and-burn (SAB) agricultural practice from eastern Finland and, using fire, developed large areas of the coniferous forests primarily for cereal production. The environmental impact of this management led to a significant landscape opening. With industrialization, charcoal production for bloomery competed with SAB cultivation, which was subsequently banned and displaced. In some remote areas of Värmland and Finnskogen, Finnish language and culture survived for more than 350 years, until the early 20th century. Today, the landscape is largely forested again and used for forestry. Through geoarchaeological and archaeobotanical analyses, preserved former swiddens can be identified and studied. The exceptionally rich source material (preservation under forest, toponyms, written sources, ethnography) enables in the temperate zone a comprehensive study of one of the oldest agricultural practices. In this way, the Forest Finns provide an ideal empirical basis for understanding comparable processes (landscape change, migration) in much earlier periods. At the same time, this rich cultural heritage, located in remote areas, is seriously threatened by highly mechanised forestry. Its recording and protection are therefore another urgent task to which research can contribute.

Mario Ranzinger, Ilenia Petrarulo and Andrea Binsfeld
Environmental and landscape investigations in the Greater Luxembourg Area: Integrating Archaeological, Historical, and Climatic Archives to model Human-Environment Interactions

This paper combines several research approaches from the University of Luxembourg which exam-ine environmental and landscape transformations from Antiquity to the Early Medieval period, and their societal impact on resource management as well as the adaptation and resilience strategies of communities in the Greater Luxembourg region.

Archaeological and historical evidence is combined with interdisciplinary methods, including geoarchaeology, dendroprovenancing, and modelling, to assess environmental and societal impacts, with a particular focus on the provisioning systems for wooden-materials. Another project uses computational models to combine environmental variables and paleoclimate data to develop quantitative spatial models that simulate the complexity of human-environment interactions and settlement change in response to specific events, such as climatic shifts.

Linking these researches will also need the study of Geoarchives such as the Mardelles (small, closed depression; ecologically important wetland), which are being sam-pled and analyzed to gain insights into environmental changes over the past 2,000 years. Of particu-lar interest is the transitional phase between Antiquity and the Early Medieval period, which raises critical questions about shifts in environmental conditions and infrastructure. Through this multidisciplinary approach, we aim to shed light on the change consequences for both the population and the environment in Luxembourg and its adjacent regions.

Cezary Namirski
Stones in the Forests: Landscape Survey in the Silesian Beskids (Southern Poland)

Abstract: the paper presents a project initiated in 2024 by the Archaeology Section of the Historical Museum in Bielsko-Biała in the Silesian Beskids (Southern Poland) in order to investigate the use of this heavily wooded mountain massif through the ages. Within the forest areas there are numerous stone structures that have never been compherensively surveyed or recorded, including several types of cairns, walls and embankments of different shapes – the chronology of many of those structures is uncertain, some of them are endangered by forestry activities. Examples of various rock carvings, some possibly prehistoric, are known from this area as well. The main goal of the project is to survey the area of the Silesian Beskids in order to build a picture of its archaeology and draw conclusions regarding possible chronology and function of the stone structures and other types of sites. The project involves a series of landscape surveys started in November of 2024, as well as archvial research. The use of GIS is planned for the subsequent stages of research.

POSTER SESSION, Day 2

Andrea Ricci, Daniele Moscone and Stefania Fiori
CultureScapes of Southwestern Asia (CUSWA) laboratory at Kiel University: aims and activities

This poster presents the CultureScapes of Southwestern Asia (CUSWA) research laboratory, a core component of Kiel University's Institute of Pre- and Protohistoric Archaeology. CUSWA adopts a multi-scalar, deeply interdisciplinary framework to explore Holocene human mobility, demographic change, settlement and resource-use patterns, and landscape transformation processes across the Fertile Crescent arch, stretching from the Zagros Mountains of southern Iran through the southern Caucasus to northern Mesopotamia and southeastern Anatolia. The laboratory combines archaeological, historical, geographical, natural- and life-sciences expertise.

CUSWA activities include: analyses of high-resolution remote-sensing and drone-photography campaigns; 3D topographic modelling and geophysical prospection; GIS and geostatistical analysis of settlement dynamics; scientific investigations of organic and inorganic archaeological materials; and reconstruction of long-term human–environment systems from the Neolithic through early historical periods. The poster outlines CUSWA's aims, methodological approach and current field work projects in Azerbaijan, Iran and Türkiye, thus offering an accessible overview of how the lab advances landscape archaeology in Southwestern Asia.

Angelika Lohwasser, Tim Karberg and Rebecca Döhl
Desert dwellers and travelers through millenia - the case of Wadi Abu Dom, Sudan

Wadi Abu Dom is a dry river valley in the Bayuda, a desert-like area located in northern Sudan. The area is characterized by rubble and rock fields and extensive sandy areas. Approximately every two years, the wadi carries water for a short time, fed by rainfall in central and southern Bayuda. Recent use of the wadi shows the coexistence of (horticultural) farmers, who settle permanently in favorable niches and engage in pastoral farming with small animals. Furthermore, nomads with larger camel herds pass through the wadi, which is a suitable transit route due to groundwater close to the surface and several wells. Pre-modern remains indicate that Wadi Abu Dom has been in use since the Palaeolithic period, and especially in the first centuries CE. During a survey project more than 6,500 graves were documented, but comparatively few settlement structures. These are often only small huts with a simple layout suggesting a strong mobile component in the population structure. Several campsites also belong in this context. This wadi is an example of adaptation of different actors to a marginal environment. Situated in an arid region, it has a wide range of economic uses, combined with different methods of socializing the landscape.

Oliwia Kubiak, Mateusz Drewicz, Robert Staniuk and Jakub Niebieszczański
Estimating timber exploitation for the construction of an Early Iron Age fortified settlement in Smuszewo (Central Poland)

Large scale human environmental impact in Central Europe is often linked to the Early Medieval period and the rapid emergence of numerous fortified settlements, which required an outstanding amount of timber. However, a similar process already took place during the Late Bronze Age and Early Iron Age (ca. 1300-500 cal BCE), when hillforts and fortified lakeshore settlements became a common feature of the cultural landscape. Biskupin-type fortified settlements, named after the eponymous Biskupin site, have provided rich evidence for wood significance in terms of dendrochronology, architecture and material culture but have yet to be analyzed in relation to woodland exploitation strategies. This research gap can be now filled with the re-analysis of findings from one of the largest fortified settlements in Smuszewo, where remains of houses, streets, and wood-earth rampart were excavated between 1959 and 1966. In our pilot study we estimate the minimal mass of wood used for the construction of the settlement, using primary excavation data from Smuszewo, as well as other published and contemporary sites. Our results provide insight into the scale of deforestation required to construct these settlements, as well as enable discussion of habitation strategies prior to their establishment

Tanja Zerl, Stefan Suhrbier, Astrid Röpke, Astrid Stobbe, Hannah Lindemann and Silviane Scharl
Regional differences in agriculture, land use and settlement patterns in Central Europe in the 5th mill. BCE

After the introduction of agriculture and a sedentary lifestyle by the Linear Pottery culture around 5400 BCE in Central Europe, a cultural, social, and economic transformation is documented in the subsequent cultures of the 5th mill. BCE. This change was particularly noticeable in agriculture. In addition an expansion of the economic area to less favourable regions can be observed. The range of crops also expanded, and evidence of using wetlands for grazing has been found. Nevertheless, it is still unclear how this development took place in detail and whether there were variations between different cultures and regions. To better understand this change, data (primarily on agriculture) from the Rhineland and the Wetterau – two favourable landscapes – were examined in greater detail. These regions have been settled since the early Neolithic and provide extensive material from settlements dating back to the 5th mill. BCE, which allows a well-founded comparison of these transformations. This comparison reveals differences in agriculture and its development in the same cultures of both regions. The reasons for these differences – whether they lie in the varying environmental settings, the cultural basis, or the geographical positioning of the regions within the Neolithic distribution – will be discussed.

Camilla Zeviani and Agostino Sotgia
At the Margins of the City: Patterns of Peripheral Land Use in the Ager Tarquiniensis during the Early First Millennium BC.

This paper examines the crucial role of so-called "marginal" areas in the formation and development of Tarquinia between the Iron Age and the Archaic period. The study adopts an integrated approach, combining paleo-environmental data with recent results from field surveys and archaeological excavations. Two key areas — the territory around Tuscania and Le Saline lagoon — were selected to investigate how settlement choices, resource availability, and strategies of territorial organization contributed to the early emergence of the city.

GIS modeling and land-evaluation analyses were used to reconstruct agricultural and pastoral potential and to understand mobility routes across the landscape. Areas traditionally viewed as peripheral are shown to have held significant economic and strategic importance. Le Saline lagoon required planned interventions to manage and exploit its particular environmental conditions, suggesting organized control of salt and lagoon resources. Meanwhile, the Tuscania hinterland reveals a structured agrarian system based on fertile volcanic soils and supported by internal communication routes. The river Marta played a key role in linking these spaces, extending Tarquinia's influence beyond its immediate territory.

The study argues that exploiting marginal areas was not secondary, but a fundamental component of Tarquinia's urbanization, shaping both its identity and regional power.

Oliver Nelle
Charcoal production sites as archives for past woodland usage and species composition

Europe's remote wooded mountain areas were densely „populated" in the 17th-19th century by charcoal makers. They had their ephemeral, small „settlements" beside their charcoal kilns in the middle of the forests, to produce the eminently important wood charcoal for all sorts of applications, amongst them the need for huge amounts of charcoal in metallurgy as a reducing agent and energy source. Originally fuelled by the interest of ecologists to gain information on past woodland composition by taxonomically identifying the charcoal remnants with a very spatially precise resolution, the research on charcoal making now has gained a wider interest amongst geographers, archaeologists and historians to assess past density, distribution, and regional importance of this craft in Europe. Formerly considered as more or less untouched woodlands are now seen as historically heavily exploited areas. After putting the research in a European context, currently under way by the EU-COST action „PoTaRCh" (connecting the past, present, and future of key nontimber forest products Potash, Tar, Resin, and Charcoal in Europe and beyond), the presentation will show some examples of the archaeological and palaeo-ecological research from SW Germany.

Markéta Kopečná, Małgorzata Kot and Magdalena Moskal-del Hoyo
The Evolution of the Cultural Landscape in the Western Tian Shan (Uzbekistan) through the Lens of the Anthracological Record

High in the Tian Shan mountains, far from modern civilisation, several archaeological sites have been discovered, both open and cave sites. These sites can only be reached on foot after a few days, so the people who once lived there were largely isolated from the populations in the valleys. It is reasonable to hypothesise that different strategies of living and different patterns of land use were employed. Evidence of human presence has been detected in this area since the Paleolithic period, while traces of short-term occupation have been documented in the Holocene. Nowadays, the people living in the mountains focus mainly on animal husbandry/pastoral activities. The aim of the research is to observe human-environment interactions that may be reflected in antracological record. The analysis of charred wood remains from various archaeological sites has been instrumental in facilitating the comprehension of the cultural landscape of mountainous regions and its evolution over time. This research is part of the INASIA project, which is funded by the European Research Council (ERC). The INASIA project focuses on the study of the ecological and cultural adaptations of early modern humans in Central Asia.

Sara Baldin
Mainstreaming the Margin: The Case of Roman Fayûm (Egypt)

Located about 100 km south of Cairo, the Fayûm Oasis offers a key case for studying economic activity in marginal environments. Surrounded by desert and sustained by the Bahr Yūsuf, the secondary branch of the Nile, the region depended on continuous adaptation to ecological constraints. Relying on the exceptional papyrological record preserved along the hyper-arid margins of the region, this paper uses the Roman Fayûm to explore how local communities and state authorities managed the balance between environment and economic demand. The approach is twofold. First, drawing on the ancient written evidence and integrating it with modern soil analyses, the paper demonstrates how local agricultural practices and crop choices reflected adaptation to diverse environmental conditions and responsiveness to state requirements. Second, by reconstructing spatial patterns of land ownership and exploitation, it shows how overlapping state and private management, together with the spatial differentiation of land use, intersected to shape long-term economic resilience. By combining textual and environmental data, the study highlights the Fayûm not as a periphery but as an integrated economic landscape where local and state interests met and interacted over time.

Mario Ranzinger

Resource Management in Late Antiquity and the Early Medieval Era. An interdisciplinary approach to reconstruct wood supply in the Greater Region of Luxembourg

This paper examines resource supply and infrastructure in the Greater Luxembourg region and surrounding areas during Late Antiquity and the Early Medieval period, with a focus on wood procurement. The densely populated and economically active landscape required large quantities of timber for construction, industry (e.g., brick and pottery production), and fuel for heating, demanding a resilient and complex supply system.

By analysing wood provenance and distribution logistics, the study investigates trade networks and economic interdependence among polities in the Treveri region. It combines archaeological evidence with interdisciplinary methods, including geoarchaeology, dendroprovenancing, and modelling, to assess environmental and societal impacts.

Particular attention is given to the transitional phase between Late Antiquity and the Early Medieval Era. The paper investigates whether local resource exploitation could sustain high output or was challenged by declining imperial infrastructure and environmental stress. It also considers whether existing networks persisted or collapsed due to political and/or ecological shifts.
As this doctoral project is in its early stages, the paper outlines the research area, planned methodology, current state of research, and preliminary findings. Ultimately, it aims to contribute to broader discussions on provenance, resilience, and adaptation in ancient communities.

Moritz Wittschen, Agathe Reingruber, Giorgos Toufexis and Moritz Nykamp

Fluvio-lacustrine dynamics as a driver of prehistoric settlement relocations in eastern Thessaly, Greece? – first results

Fluvio-lacustrine environments are ecologically diverse yet dynamic landscapes that offer access to a wide range of resources, making them consistently attractive settlement locations. Today, the northwestern part of the Larissa Plain along the lower reaches of the Pinios River is a vast alluvial lowland. In Antiquity, however, this area was described by the geographer Strabo as Lake Nessonis. The prehistoric settlements in the adjacent Sykourio Basin seem to respect a reconstructed shore of Lake Bara Toivasi suggesting that this lake existed already in prehistory and the shifting settlement patterns seem to follow lake re- and transgressions. Settlements that occupied topographically lower locations during the EN (6500–6000 BCE) were abandoned in favor for higher locations during the MN (6000–5500 BCE) and were again relocated to the plain and expanded substantially during the LN (5500–4500 BCE). In a new study we will test and refine the paleoenvironmental narrative by analyzing radiocarbon-dated sediment cores obtained along a NE-SW transect across the former lake basin. XRF-derived geochemical compositions are interpreted using multivariate statistical techniques to examine the lacustrine stratigraphy, reconstruct the fluvio-lacustrine paleoenvironments, and constrain the timing of floodplain aggradation in the area of former Lake Nessonis.

Marlies Außerlechner, Klaus Oeggl and Andreas Putzer

Charcoal data from Bronze and Iron Age alpine sites in the Eastern Alps

Charcoal is found in the samples of nearly every archaeological excavation. In some cases, records include a considerable number of charcoal pieces with adequate size to analyse ecological traits that are able to provide data for the interpretation of past land use. This study presents ecological data of more than 4,000 charcoal pieces from different alpine sites in the Eastern Alps with focus on valleys in South Tyrol, aiming to show the potential of anthracological analysis for the reconstruction of environment and human impact. For this purpose, traits such as taxon, ring width and diameter were documented, statistically evaluated and compared with radiocarbon data, palynological and archaeological data. The results indicate the modification of the alpine landscape by human activities such as pastoral agriculture and extensive wood use, which lowered the timber line to the present level.

Anna Schneider, Thomas Raab, Alexandra Raab and Alexander Bonhage

Land use legacy landforms and soils in forest areas of eastern Bavaria

Various forms of past land use result in characteristic alterations of surface morphology and soils, which are often well preserved in recent forest areas. The interpretation of LiDAR Digital Elevation Models (DEMs) can greatly enhance our insights into the geoarchaeological record of woodlands. We examined legacies of past land use in forested areas of Upper Palatinate, Germany. Based on LiDAR DEMs, we mapped land use legacy landforms (LULLs) that occur frequently in the study area, that is, former agricultural field systems, road remnants, abandoned ponds, relict charcoal hearths, mining legacies, and indicators of anthropogenically induced soil erosion. The corresponding soils were characterized in six selected study areas. Results reveal that 17% of the forested area is affected by LULLs, with the largest areas covered by former field systems and roads. Characteristic LULL associations reflect past land use systems, e.g., past agricultural landscapes or historic charcoal production areas. Most mapped LULLs date to the late medieval to modern period. The examined LULL soils show characteristic stratigraphy and properties. Our results underscore the enduring impact of past land use on present woodland ecosystems and emphasize the importance of considering forest areas in the analysis of past human–landscape interactions.

Alexandra Raab, Thomas Raab, Anna Schneider, Alexander Bonhage, Franz Schopper, Robert Martin and Jens Greif

Reconstructing the Palaeoenvironment at Germany ´s Largest Bronze Age Barrow Cemetery: A Geopedological Approach

The barrow cemetery in the Schweinert Forest (SW Brandenburg, Germany) comprises over 650 visible above-ground burial mounds, representing an archaeological site of outstanding importance. Attributed to the Lusatian culture, the complex dates from the Late Bronze Age to the Early Iron Age (1100–650 BC). After an 80-year research hiatus, an interdisciplinary project was initiated to reconstruct the site's palaeoenvironmental context. Located in the North German Lowlands, within the Breslau–Magdeburg–Bremen ice-marginal valley, approximately 150 km southwest of Berlin, the site features a flat terrain at around 83 m a.s.l. and a continental climate. The cemetery is situated near the floodplain of the Schwarze Elster River on the Lower Terrace Complex. Minimally invasive methods were employed to reconstruct the Late Pleistocene to Holocene landscape development at the Schweinert and its surroundings. Geophysical surveys (GPR, ERT) were conducted along toposequences, and soil pits were excavated at key geomorphological positions. Additionally, a small-scale archaeological excavation was undertaken on a selected burial mound. Analyses comprise standard pedological methods and specialized techniques, such as pollen analysis and the identification of tree species from microscopic charcoal fragments. For absolute dating, both 14C and OSL dating methods are applied. The paper reviews and discusses the current research findings.

Anne Köhler, Marco Pohle, Matteo Bauckholt, Marie Kaniecki, Natascha Mehler, Ulrike Werban and Christoph Zielhofer

First Geophysical and sedimentological insights into the remains of a Slavic fortification in the Lower Havel Inner Delta

The Lower Havel River Region has been a focal area of human occupation since the Mesolithic period, reflecting long-term interactions between settlement dynamics and hydrological changes. Within this context, the Lower Havel Inner Delta and adjacent Lake Gülpe represent a key locality for investigating settlement continuity and environmental change. On a prominent Pleistocene fluvial sand island bordering the Havel River, the remains of a Slavic fortification form one of the most distinctive archaeological features in the area. The surface morphology and previous archaeological finds, spanning from the Neolithic onwards, indicate repeated phases of occupation and reuse of this strategically positioned site. The main aim of this study is to reconstruct the spatial organisation, environmental setting, and transformation history of the site. By integrating archaeological, sedimentological and geophysical approaches, it contributes to understanding long-term settlement dynamics and human-environment interactions in the Lower Havel River Region. Recent fieldwork combines geophysical prospection methods (EMI, ERT) with driving core drillings and direct-push sensing to explore the internal structure and surrounding floodplain. The data reveal at least three settlement phases in parallel with alternating phases of geomorphological activity and stability and a preserved infilled moat, offering excellent conditions for further sedimentological, geochemical, and palynological analyses.

Steven van Ens

Creating an open-access database of Roman-period roads in the vicinity of Rome

Despite a rich topographic tradition, knowledge of Roman roads in the vicinity of Rome is still limited. An historical emphasis on the well-known ‚consular' roads or ‚viae publicae' has meant that the landscape between these ancient highways is relatively empty in terms of road information. For some areas, data does exist, but both the coverage and availability is fragmentary at best. At the same time, more and more detailed data for this area is generated through decades-spanning archaeological survey projects. Recently, three large datasets have been integrated into a single dataset as part of the Roman Hinterland Project (RHP). My PhD-project centres on the question: how does the development of ancient infrastructure in the project area influence the (economic) development and integration of rural sites? By combining ancient road data with the RHP-database, this project aims to investigate the (local) Roman economy from a new perspective. In order to do this, however, it is first necessary to compile known information on Roman roads in the project area into a database. This poster presents the background, methodology, metadata and results of that effort. By publishing this data as open-access, it may also aid other researchers working in this area.

09:00-10:40 Session 32A:
General session: Project highlights

LOCATION: U5 / 02.18

09:00 *Giorgi Bedianashvili, Andrew Jamieson, Claudia Sagona and Catherine Longford*
Assessing Landscape Change and Monument Visibility through Multi-Temporal Aerial and Remote Sensing Data: A Case Study from Zveli, Southwest Georgia

This paper explores the transformation of the cultural landscape surrounding the village of Zveli in southwest Georgia, with a focus on how modern land use has affected the visibility and preservation of archaeological monuments. By employing non-invasive methods — including recent LiDAR scans, CORONA satellite imagery, and Soviet-era aerial photographs—this study compares spatial data from 2024, 1964, and to assess changes in terrain and site visibility caused by agricultural intensification and construction activities during the Soviet period (1970s–1980s). Zveli is located on the slopes of the Erusheti Mountain, overlooking the Kura River Valley. The central archaeological feature of this region is the Rabati multi-phase settlement, situated on the northern edge of the village. Excavated since 2016 by a Georgian – Australian team, Rabati has revealed significant Early and Middle Bronze Age deposits, alongside monumental stone structures from the Medieval period. In the broader landscape, numerous large kurgans and associated settlement remains suggest a long-term and dense occupation throughout multiple historical periods. This methodology, which has proven successful in other archaeological contexts, enables the identification of previously undocumented features. The remotely sensed data are verified through field survey and documentation, offering a robust approach to reconstructing archaeological landscapes impacted by recent land use.

09:10 *Rajan Koyu*
Megalithic burial sites of south India and patterns of settlement A study based on surveys in the Palakkad Gap region of Kerala, India

Megalithic tradition, starting around 5000 BC in western Europe, had a late start in south India. The region to the south of the Vindhyas is known for the widespread presence of megalithic burial sites supposed to be associated with iron using agricultural and pastoral communities who had lived in the region from about 1000 BC. Archaeological investigations into the megalithic culture of south India since the late 18th century have brought out more evidences on burial practices. There has been very insignificant progress in the matter of settlement sites. Sites in Tamil Nadu have provided information on various aspects of settlement structures. Even there, evidences on settlement have been less. On the other hand, Kerala is one region where archaeologists have been unable to gather evidences on settlements. The present study is looking at this issue of virtual absence of settlement sites in the light of evidences on the same from sites elsewhere in India. The author is using empirical data gathered from field work conducted in the Palakkad Gap region since 2007. The study makes use of insights from certain sites some of which had not been settled till the 1950s and others until late 1970s.

09:20 *Parth Chauhan, Rajesh Poojari and Nupur Tiwari*
A landscape perspective on the rock art sites of the Narmada Valley, central India

The Indian Subcontinent preserves a rich record of rock art in the form of engravings, etching, bruisings and paintings found in diverse contexts such as rock shelters, caves, bedrock and open-air laterite surfaces. Although this record has been known for over a century, most studies have been restricted to the reporting of new sites and/or descriptions and counts of individual themes in the images. Very few studies have gone beyond these methods; exceptions include scientific analyses of archaeological pigments, studies of overlapping patterns and experimental replication of paintings, engravings and/or cupule marks. The present study focuses on the rich and dynamic rock art record of the central Narmada Valley (central India), specifically along the frontal zones of the Vindhyan and Gondwana ranges of hills. We attempt to identify potential patterns and correlations between subject matter, styles and geographic locations within the study area. We also propose potential factors and explanations for the geographic locations of specific painting themes and styles in this region. Example attributes that are highlighted as possible factors for the spatial and contextual patterning include topography, drainage patterns, specific geological features and inter-site connectivity and social networks of prehistoric human populations.

09:30 *Doris Mischka and Carsten Mischka*
Ceramic for the houses – Surface collection to enhance geophysical survey on copper Age settlements in Northeast Romania?

Since more than a decade UFG FAU is conducting gradiometer surveys on Copper Age sites (mainly Pre-Cucuteni and Cucuteni) in Northeastern Romania (Moldova). Since long, the gradiometry has proofed itself as tried-and-true method for localisation of settlements and delivering their spatial layouts. Sad but true, it also will never be able to deliver chronological information. Full scale excavations have proven to be not suitable as a method, as many of the sites are from very large size. To get a grip on the question of the contemporaneity or the sequence of houses, ditches etc., it was tried to combine the features from the gradiometry plans with surface collections on the same spot. The results show all the possibilities and even more, the limitations of this approach.

09:40 *Tiffany Yee Ching Ma, Giacomo Vinci and Alessandro Fontana*
Reconstructing Archaeological Landscape in the Isonzo Karst (NE Italy) using Remote Sensing and Field Survey

This study presents the first Lidar-based investigation of the Isonzo Karst, which is a 65 km2 area located in northeastern Italy, between the cities of Monfalcone and Gorizia. The aim of this study is to use multi-disciplinary approaches to discover new archaeological sites in the Isonzo Karst, in addition to the 11 prehistoric hillforts and several archaeological caves previously identified in the 20th century. Methodologically, this study integrates the use of LiDAR, satellite images, historical maps, and the software QGIS to map out all archaeological traces in the Isonzo Karst. Archaeological traces are then systematically verified through field surveys, during which surface artefacts are documented and collected.

This study results in the discovery of a number of new archaeological sites in the Isonzo Karst. Firstly, a Quadriburgium-type Late Roman Camp dating to the 4-6th century CE, is discovered. Secondly, two 17th century diamond-shaped military forts related to the Gradisca War (1615-1617), are identified. Thirdly, dry stone wall structures related to past agro-pastoral activities, including enclosed dolines, clearance cairns, and multicellular sheepfolds, are identified. Together, our study substantially contributes to the regional history of an understudied area in northeastern Italy.

09:50 *Michael Hein, Usmar Nik, Annabell Engel, Johannes Rabiger-Völlmer, Johannes Schmidt, Matthias Silbermann, Marco Pohle, Iris Nießen, Martin Offermann, Lukas Werther, Birgit Schneider, Christian Tannhäuser, Alexander Herbig, Jan Nováček, Ulrike Werban, Martin Bauch and Christoph Zielhofer*
What the landscape can tell: An integrative stratigraphic prospection approach to localize a Black Death mass grave in Erfurt/Central Germany

The Black Death (1346–1353 AD) caused a 30–50% population decline across Europe. Historical sources document major losses and mass graves in Erfurt, Thuringia. This study aims to locate these burials near the deserted village of Neuses to validate archival records and obtain skeletal remains for anthropological and archaeogenetic analyses. We applied an integrative approach combining historical research with minimally invasive stratigraphic and geophysical prospection. Based on GIS-supported historical mapping, percussion coring and electrical resistivity tomography (ERT) were conducted within the targeted area. Coupled ERT and coring data elucidated late Quaternary sedimentary processes and distinguished two major soil zones: (1) a Chernozem zone and (2) a Black Floodplain Soil (humic fluvisol) zone. These zones informed the reconstruction of the medieval settlement structure and guided the localization of potential plague burials. Despite extensive 20th-century ground disturbance, a subsurface pit structure was identified in both borehole and ERT profiles. AMS radiocarbon dating of recovered bones confirmed a 14th-century origin. As confirmed Black Death mass graves are rare, our systematic discovery provides crucial material for studying Yersinia pestis evolution and medieval epidemic responses, while demonstrating the effectiveness of integrative, non-invasive archaeological prospection methods.

10:40-11:10 **Coffee Break**

11:10-12:30 Session 2B:
From Point Clouds to Patterns: Machine Learning in Landscape Archaeology

CHAIRS: *Axel Posluschny, Susan Curran, Jürgen Landauer, Simon Maddison, Žiga Kokalj, Giacomo Fontana, Nejc Čož*
LOCATION: KR12 / 02.18

11:10 *Nejc Čož, Luka Škerjanec and Žiga Kokalj*
Barrows Beyond Borders: How Far Can an Irish Model See?

The Automatic Detection of Archaeological Features (ADAF) tool applies convolutional neural networks for semantic segmentation of airborne laser scanning (ALS) data to detect archaeological structures. Originally trained on Irish and UK datasets to recognise barrows, ringforts, and enclosures, ADAF was designed as an accessible deep learning tool requiring no programming expertise. This study evaluates the transferability of the Irish-trained model to a contrasting environment—southern Herzegovina—using high-resolution ALS data from the ERC project STONE. The region's karstic landscape, with thousands of small, densely clustered prehistoric barrows, provides a demanding test for model generalisation across geomorphologically distinct contexts. Preliminary results show that ADAF successfully identified around half of the known barrows with few false positives, confirming cross-regional morphological consistency. However, dense clusters and rugged relief reduced detection accuracy. Future work will retrain ADAF using a curated Herzegovinian dataset to quantify improvements and explore how fine-tuning enhances regional adaptability. The study contributes to developing transferable AI frameworks for large-scale archaeological prospection.

11:30 *Timo Geitlinger*
All Good Things Come in Threes: A tripartite Machine Learning Approach Towards Location Modelling of Western Swiss Burial Mounds

The placement of western Swiss burial mounds has previously been characterised as largely unspecific and lacking any clear, recognisable pattern. This paper re-examines the location of these monuments by presenting a new Archaeological Predictive Model (APM).

While machine learning predictive algorithms are now widely used in recent applications of APM–and have largely replaced traditional regression models as modelling technique of choice–this case study uses Machine Learning in three distinct ways: a) to increase the available training parameters by extrapolating environmental observations from historical maps to the wider research area; b) to expand the training sample by automatically detecting mounds in high resolution LiDAR data; and c) to train the actual model using a Random Forest algorithm in a Monte Carlo framework.

As indicated by the high prediction metrics, this integrated tripartite approach proves to be statistically robust and offers a powerful means of reconstructing and analysing past landscapes. Furthermore, the APM clearly demonstrates that the location of the mounds indeed follows observable and quantifiable patterns that were not recognised in previous research.

11:50 *Yidan Zhang*
Cost-aware ML with LCP for Ancient Route Modelling in the Upper Minjiang, Eastern Rim of the Tibetan Plateau

High-relief terrain makes the reconstruction of exchange routes among mountain sites extremely difficult and prone to confusion with modern linear features. We evaluate the contribution of integrating ML with LCP to route modelling in the Upper Minjiang (Eastern Rim of the Tibetan Plateau) during the Late Neolithic. We fuse 30m DEM–derived factors—river distance, slope, vegetation, elevation, aspect/solar radiation, and land curvature—and train a Random Forest to produce a route-likelihood raster. Labels are evenly spaced points along known/suspected routes; hard negatives come from modern roads, terrace edges, and gullies, with additional pseudo-absences in surveyed areas. Post-processing with connectivity and minimum-length thresholds plus land-cover masks yields ranked high-likelihood route segments and candidate passes. Validation uses a site-holdout design within the pilot window and a mini leave-one-sub-basin-out test; metrics: AUROC and precision@K. Benchmarks compare LCP-only, ML-only, and a hybrid. Findings & implications: ML complements LCP by learning observable affordances; on rugged, forested slopes the hybrid improves precision@K at fixed recall and diagnoses GIS limitations—e.g., it (i) reduces sensitivity to hand-tuned cost weights and origin–destination choices, and (ii) recovers mid-slope traverses and approaches to passes that pure LCP tends to under-represent—thus providing ranked targets for efficient verification and more reliable ancient route modelling.

12:10 *Fabiana Macerola, Giuseppe Luzzi, Emanuele Gugliandolo, Federica Boschi, Enrico Giorgi, Enrico Zampieri, Maria Anna Di Palma, Giuseppe Parisella and Alberto Santoro*
AI Applied to the archaeological aerial photoreading: a case study from the Northern Adriatic Italy

Archaeological Impact Assessments are essential for approving major infrastructure projects in Italy, shaping project planning and resource allocation. Identifying archaeological anomalies from aerial and satellite imagery for these assessments is a complex and time-consuming task. An AI-based workflow was developed by Terna within the HG Dorsale Adriatica project, in collaboration with the University of Bologna and NTT Data, to facilitate the early detection of archaeological and geomorphological anomalies in the southern Po Valley, specifically within the municipalities of Forlì and Ravenna. This approach integrates both historical and contemporary aerial imagery into a harmonised, georeferenced dataset to enable systematic and large-scale analysis. Expert archaeologists contribute through manual labelling and validation, ensuring the interpretability and reliability of the results. Model outputs are aggregated into probabilistic maps that highlight areas with elevated archaeological potential. This system provides a scalable and standardised framework, improving predictive capabilities, accelerating initial evaluations, and enabling better-informed decisions for assessing archaeological risks in large-scale infrastructure planning, in accordance with Italian preventive archaeology regulations (D.Lgs. 36/2023).

11:10-12:30 Session 5B: Marginal economies or economies on the margins?

CHAIRS: *Agostino Sotgia, Dario Monti, Elena Scarsella*
LOCATION: U5 / 02.22

11:10 *Michał Adamczyk, Katarzyna Ślusarska, Jacek Karmowski, Marissa Ramsier and Katherine Menor*
Hunters, Herdsmen, Hard Rock Lovers. The Stone Age Landscapes of Żelewo, North-Western Poland

The multicultural site Żelewo 1-3 is located in the area of the Miedwie Lake in the North-Western Poland, a region rich in resources and traces of human settlement throughout the prehistory and historic times despite its environmental obstacles. The ongoing excavation of the site takes place since 2023. Although so far the main focus of the research was the Medieval Cemetery part of the site, a sizeable set of the Stone Age artefacts was registered and collected in the process. Based on the lithic technology, multiple episodes of Palaeolithic, Mesolithic and Neolithic settlement took place at the spot. On the other hand, unmodified pebbles of flint were absent at the site, suggesting presence of other, unknown sources of the raw material and possible sites related to their exploitation. This sparked a side-project focused on the raw material procurement and wider Stone Age settlement networks within the changing and challenging environment of the Żelewo area. The following paper presents our first insights and results on this subject.

11:30 *Becky Vickers*
Working stone and making places during the Neolithic in upland Wales

This paper explores the challenges and insights derived from studying Neolithic axe making remains in the uplands of North Wales. Stone-axe making sites have long been presented as marginal places in the Neolithic landscape. Their marginality is influenced by their mountainous settings, away from core settlement areas, and in locations that can be difficult and dangerous to access. And yet, despite this 'marginality' they played a pivotal role in the Neolithic landscape. In the Carneddau, North Wales, people in the 4th and 3rd millennia BCE were crafting thousands of stone-axe roughouts. Similar to other axe-making sites, these roughouts were finished away from the extraction sites and widely distributed across Britain. This treatment demonstrates they were both valued blades and symbolic links with the distant production sites.

The Carneddau is a craggy upland environment, with expansive views and moorland basins. Today this is an agriculturally marginal landscape, yet these mountains are central to the region's cultural character. The transformations taken place on this landscape demonstrate a deep persistency and significance to communities in the past and present. Drawing on the results of a five-year archaeological project, this paper explores tensions between the cultural intensity of the Carneddau and its physical marginality.

11:50 *Marguerite Waechter*
Living and dying on the margins: late prehistoric upland land uses in south Northumberland, England.

In most parts of the British Isles, uplands are now considered "marginal" – whether it be environmentally, economically, or socially. They are often barren and unable to sustain modern farming economies. However, this was not always the case, as evidenced by complex late prehistoric ritual landscapes and settlements.

This talk presents new palaeoecological and archaeological work undertaken at Hepple Rewilding Estate in the Simonside Hills (Northumberland, England). Despite dense concentrations of Bronze Age burial cairns and Iron Age hillforts, few excavations or systematic surveys have taken place in the area, and late prehistoric farming economies are thus poorly understood. As part of the "Rewilding" Later Prehistory project, new peat cores were collected at Hepple at c.350 masl, providing long-term pollen records. Results of this work are presented here, and phases of woodland clearances, heath expansion, or mixed farming are compared to known archaeological sites or events.
By considering palaeoecological and archaeological records together, this talk hopes to present a richer picture of late prehistoric upland land use in the Simonside Hills than is currently available based on archaeological evidence alone. This work highlights that far from always being considered marginal land, uplands were well integrated within late prehistoric societies.

12:10 *Jessica Keil*
When in doubt, don't do it – copper production as part of the economic system of Bronze Age Tyrol (Austria)

Perceiving the Alps as a harsh and challenging landscape, their prehistoric appropriation is typically attributed to strong economic pull factors. In the Eastern Alps, the first significant occupation of the inner Alpine region is associated with the emerging interest in copper ore deposits during the Early Bronze Age (from c. 2200 BC onwards). Research has predominantly focused on the chronology, technology, productivity, and social organisation of copper mining districts, alongside related aspects such as resource supply, population dynamics, food production, and exchange networks. Given the labour- and resource-intensive nature of ore extraction and metallurgy, as well as the wide distribution of the copper produced, these activities are often assumed to have been the dominant economic sector of the time. With regard to Bronze Age Tyrol, however, archaeological and palynological evidence suggest that metal production played a subordinate role within the broader economic system. Instead, husbandry and agriculture seem to have been of greater importance. These subsistence strategies, which made use of the different altitudes of the Alpine terrain, were rooted in the late Mesolithic period and were adapted towards the Middle Bronze Age to become more climate-resilient. Under uncertain circumstances, sustaining communities was apparently more important than copper production.

11:10-12:30 Session 12B: Abrupt Environmental Change of Human-Environmental Systems in the Sedimentary Records

CHAIRS: *Ayaka Nguyen, Sara Saeidi, Stefan Dreibrodt, Giulia Di Giamberardino*
LOCATION: U5 / 00.24

11:10 *Jonna Bügenburg, Raiko Krauß and Christopher Miller*
Reconstructing human-river interactions in the context of Early Neolithic settlement in the Carpathian Basin at the site Movila lui Deciov

The transition from Early to Middle Holocene in the Carpathian Basin is connected to the 8.2 event and was marked by socio-demographic and environmental change. For the process of Neolithization the settlement within the Carpathian Basin is an important stage of adaptation to a landscape and environment different from the Neolithic core regions.

One pioneer settlement is the Early Neolithic site of Movila Lui Deciov in Northern Romania. The sites atypical archaeological record, such as high consumption of aquatic resources, and houses constructed with reed plants, suggests a dynamic, fluvially active landscape.

To investigate human-river interactions in the context of early farmers, a multidisciplinary approach was used. LiDAR, geomagnetic images and historical maps were combined with sediment analysis, OSL dating and ATR analysis on six sediment cores next to the site. The stratigraphic data revealed a meandering channel in a paleowetland with seasonal flooding and drying cycles near the site, whose activity was dated to 7.1 ka BP. Furthermore, the site was established on top of a point bar terrace, elevating it above the floodplain area for flood protection.

Movila lui Deciov highlights how wetland ecologies shaped settlement choices and the importance of local environments in the process of Neolithization.

11:30 *Antonia Reiß, Hanna Hadler, Bente Majchczack, Dennis Wilken, Ruth Blankenfeldt, Soetkin Vervust, Sarah Bäumler, Dirk Bienen-Scholt, Ulf Ickerodt, Stefanie Klooß, Timo Willershäuser and Andreas Vött*
From land to sea: medieval overexploitation triggers land loss around Hallig Hooge, North Frisian Wadden Sea (Germany)

The North Frisian Wadden Sea has been intensely shaped by human-environment interactions since medieval times. Around the northern Halligen islands, Frisian settlers cultivated and exploited the coastal landscape by removing marsh soil to extract underlying peat for salt production. Reaching a near-industrial scale, this human impact not only turned large areas into wasteland. By lowering the ground surface, it also increased the coastal vulnerability, enhanced the impact of major storm floods and triggered abrupt environmental changes. Still visible today, clear footprints of these human-environment interactions are left in the sedimentary record. Combining geoarchaeological, geophysical and archaeological investigations, our study seeks to evaluate the impact of peat exploitation on the coastal landscape development. OSL and 14C dating of the former ground surface prove that the systematic exploitation of peat was already far advanced in the mid-13th cent. AD. Reconstructions of the extraction level at c. -0.4 to -0.8 m NHN show that this exploitation seems to have lowered the ground surface into the range of mean high water at that time. The intense medieval use of natural resources for salt production thus significantly altered the local topography and possibly triggered the devastating effects of (major) storm surge events in region.

11:50 *Ayaka Nguyen, Sara Saeidi and Stefan Dreibrodt*
Structured discussion: „When Does Adaptation Become Maladaptation?“

11:10–12:30 Session 9B:
Settlement dynamics in floodplain landscapes

CHAIRS: *Iris Nießen, Martin Offermann, Jens Schneeweiß, Johannes Schmidt, Alexander Voigt*
LOCATION: U5 / 01.22

11:10 *Jens Schneeweiss and Matthias Hardt*
Medieval Landscape Transformation in the lower Mid Elbe region

The river landscape of the lower middle Elbe, between Havel and Elde mouths, underwent a profound transformation during the High Middle Ages, laying the foundation for today's fluvial anthroposphere. In the second half of the 10th century, heavy rainfall in the river's upper catchment produced high waters that damaged fortifications on both banks. These events may have sparked early dike construction already in Ottonian times and perhaps contributed to the Elbe Slavs' revolt in 983, which apparently ended the dike-building effort. More than 150 years later, a process began that radically altered the Elbe's floodplains. Following the military subjugation of the Elbe Slavs by the East Frankish Empire, migrants from the Low Countries and the Rhine regions were recruited. They, together with autochthonous Slavic inhabitants, erected dikes on both riverbanks and established in this way hinterlands with a different settlement pattern. In the Hanovrian Wendland, circular villages (Rundling) and characteristic ridge-flats created a unique cultural landscape whose origins still remain unexplained. The complex interplay of weather and climate events, dike construction and settlement abandonment or establishment, respectively, and the consequent changes to the river and road networks, have shaped this landscape – making their interrelations the focus of current research.

11:30 *Marion Foucher and Annie Dumont*
Mills on piles or boat-mills? Impacts of hazards, war and fluvial environments on the technology of French medieval watermills

Medieval watermills on great rivers are not a commonplace object of studies by combining archaeological and historical data. Yet, recent researches led on some of France's main rivers, have firstly revealed the variety in typology and secondly enlighten the complex interactions between these different mills and the contexts, either natural, technological or social and historical (war, other uses). Usually called „mills at the bridges“ in archives, many of these infrastructures are located in their vicinity, despite the weaknesses it might induce. Recent archaeological surveys and historical researches on La Charité-sur-Loire and Nevers have documented these mills (built on piles more or less disconnected from the bridges) and the relationship between technological choices and these towns' contexts and environments. On the lower Doubs valley, the watercourse great instability has been a challenge and boat-mills the only solution suited to the fluvial style. the case study of Dole combines all these contexts, pressure and concerns, through the hesitation between on piles or boat-mills in order to cope with military stakes, Doubs' migration and and the climatic degradation of the Little Ice Age. More unusual, these sites also document some attempts and fails, and technical knowledge transmission from one watershed to another.

11:50 *Ema Zvara, Snježana Pejdanović, Birgit Schneider, Ella Quante, Sara Saeidi G.A., Iris Nießen, Tobias Lauer, Kathryn E. Fitzsimmons, Johannes Rabiger-Völlmer, Sven Marhan, Ellen Kandeler, Christian Poll, Yvonne Oelmann, Harald Neidhardt, Susanne Lindauer, Ulrike Werban, Gerrit Jasper Schenk, Peter Frenzel, Lukas Werther, Peter Kühn and Christoph Zielhofer*
Biochemostratigraphy of the Eger floodplain - detection and quantification of heavy metal pollution and paleoenvironmental conditions

Floodplains have been used for, and transformed by, a range of anthropogenic activities, which had a significant impact on their development, resulting in different land use practices and the accumulation of pollutants. While pollution of floodplains by industrial activities is an established issue in environmental sciences, the extent and impact of such pollution during the pre-industrial period remains poorly understood. We aim to address this lack of understanding through a study of the Eger River, a third-order Danube tributary, and its floodplain within the Nördlinger Ries, Germany. We integrate results from geoarchaeological excavations with a multiproxy record of the Middle to Late Holocene overbank stratigraphy. Our biochemostratigraphic reference model is based on the synergistic interpretation of sediment texture, element concentrations, microfossils, dating and biogeochemical parameters, including enzyme activities, stable isotopes (δ13C, δ15N) and TC, TIC, TOC, TN, CaCO3 concentrations. Sediment analysis 2 km downstream from Nördlingen reveals a formerly anastomosing floodplain, an ideal riverscape for mill installations, and elevated concentrations of Pb, Cu, and Cr linked to human activity in modern times. By extending the temporal perspective on human impact, our research contributes to a more nuanced understanding of long-term human-environment interactions in Central European riverscapes.

12:10 *Anne Köhler, Marie Kaniecki, Rita Gudermann, William Fletcher, Anja Linstädter, Natascha Mehler, Ulrike Werban and Christoph Zielhofer*
Floodplain and Peatland Histories in the Lower Havel Region: Tracing Settlement Dynamics and Human–Environment Interactions through the Holocene

Floodplains and peatlands represent some of the most dynamic and sensitive components of Central Europe's cultural landscapes. Both environments have been shaped by climatic changes, hydrological shifts, and human activity. Although they share similar hydrological conditions and transitional characteristics, their histories of transformation differ strongly. Floodplains were settled and modified early, through cultivation, river regulation, and hydraulic engineering from prehistoric and medieval times onward, while adjacent peatlands remained largely natural until widespread drainage and reclamation began in the early modern period. This study compares the long-term development of a floodplain and an adjacent peatland in the Lower Havel region (northeastern Germany) to explore their different pathways toward the Fluvial Anthroposphere. Archaeological monument data were analysed according to period, site type, geomorphological position, and distance to the river, and then combined with geological, hydrological, and topographical information. These data help to trace how settlement, land use, and reclamation evolved in response to environmental conditions. A recalibrated pollen record provides environmental context for interpreting settlement phases and open-land dynamics. Together, the results highlight how floodplains and peatlands responded differently to hydrological change and human impact, offering new insights into the spatial and temporal diversity of socio-ecological transformations in the Lower Havel region.

11:10–12:30 Session 23B:
Geospatial Analysis in Archaeological Heritage Management

CHAIRS:
Marc Miltz, Philipp Hagdorn and Stefanie Dr. Berg
LOCATION: U2 / 01.33

11:10 *Irmela Herzog, Renate Gerlach and Nina Strünker*
Towards Quantifying Land Use Dynamics Based on Heritage Management Data

Both a Heritage Management database of over 100,000 archaeological observations (e.g., excavations, surveys) and a digital soil map are the basis for statistical approaches towards quantifying land use dynamics in the Rhineland. Two different relatively flat landscapes, with different natural characteristics were analysed separately. Geoarchaeologist Renate Gerlach classified the soils in terms of their quality for past agricultural use. The aim of the analyses presented here is to test hypotheses concerning changes in land use. For instance, early Neolithic sites are said to have preferred loess soils, whereas this does not seem to be the case for Bronze Age remains. The analyses are based only on observations located in areas with undisturbed soils. However, the main difficulty is the fact that the number of observations is not necessarily an adequate proxy for the number of sites. For each observation, the database can either store a point or (multi-)polygons; points are often used for archaeological observations prior to 1970. To address this issue, different approaches have been developed, which have been combined with a statistical test. The talk will present these approaches and some of the results, as well as a discussion of the limits and potential of each approach.

11:30 *Jan Miera and Hans von Suchodoletz*
Discussing the impact of pH values and modern land use on site distributions: a big data approach

Since 2023, a geoarchaeological research project funded by the German Research Foundation (DFG) has been investigating prehistoric settlement dynamics between the Neolithic and the end of the pre-Roman Iron Age in Germany. For this purpose, over 11,000 sites from 13 regions have been systematically recorded and standardized to enable supra-regional comparisons. This dataset allows, for the first time, the identification of periods when supra-regionally uniform settlement patterns existed and when regionally differing decisions were made. A central element of the project is the critical evaluation of site distributions. In this presentation, we will use statistical analyses to demonstrate how local pH values affect the preservation of prehistoric pottery from different periods. Furthermore, we will utilize data on modern land use from the European Union and show the impact of different agricultural strategies on the preservation and visibility of archaeological sites.

11:50 *Adam Ostrowski, Joel Roskin, Itamar Taxel, Lotem Robins and Revital Bookman*
GIS-based Geomorphic Mapping of Early Islamic Agricultural Earthworks in Aeolian Sand: The Plot-and-Berm Agroecosystem by Caesarea, Israel

Mapping aeolian sand groundwater harvesting reveals size and structure of an Early Islamic Plot-and-Berm (P&B) agroecosystem at the hinterlands of Caesarea on the south-eastern Mediterranean coast (Israel). The ancient construction in a sandy environment consists of polygonal depressions that are understood to have served as agricultural plots between berms of sand mixed with Roman and Early Islamic refuse. The plot and berm surfaces, coated with grey anthrosols, have been dated as being in use and cultivated for over 200 years. Although the agroecosystem was abandoned by the Early Crusader period, the use of historical aerial photographs, satellite- and drone images allowed for mapping the preserved parts using ArcGIS Pro, targeting the inquiry of its functionality for cultivation. It revealed at least 469 plots, covering approximately 1.73 km2, where the length of berms was measured to ~59 km. The organized arrangement of the western P&B suggests the construction was initiated along the beach and grew eastwards, transitioning into a more randomized structure. This pattern provided stability against erosion and enabled systematic division of separated agricultural properties amongst farmers. The geoarchaeological study emphasizes the importance of sustainable water harvesting in coastal environments, in order to face the challenges of climate-change.

12:10 *Marius Kröner*
Massive landscape transformation by industrialisation in the western Ruhr region and how to deal with it – the example of Duisburg

The Ruhr region is recognized internationally as an industrial landscape of European significance. Its industrial development began duiring the 18th century, primarily driven by coal mining and iron processing. Evidence of hard coal extraction in the area dates back even further, to the late 13th century. The expansion of mining activities and the establishment of underground coal shafts brought about profound and lasting transformations of the landscape. In Duisburg, located at the western edge of the Ruhr region, features such as mining-induced subsidence, water management systems near rivers, and the deposition of spoil heaps continue to shape the urban environment. Beginning in the 19th century, large-scale industries, particularly in the steel, paint, and chemical sectors, further altered the landscape. These industries often had a more immediate and striking impact, characterized by extensive land consumption, prominent industrial architecture and accompanying environmental pollution, arguably more visible than the effects of subsidence. This paper seeks to explore the specific impacts of 19th-century industrialization on the urban landscape of Duisburg. The focus will be placed on how these transformations are addressed within the practice of archaeological heritage management, particularly in the context of large-scale industrial sites that resurface during land redevelopment projects.

11:10-12:30 Session 26B:
Spatial Approaches to Bronze Age Landscapes in the Mediterranean: Linking Archaeological Theory and Quantitative Methodology

CHAIRS: *Davide Schirru, Matteo Alessi, Alessandro Vanzetti, Emily Holt*
LOCATION: U5 / 02.17

11:10 *Joey Caputo and Luca Lai*
Exploring social complexity in Bronze Age Sardinia: quantifying site types and their territorial variation as markers of organizational patterns

Complexity is a complex idea. Rather than sharp dichotomies, different kinds and layers of complexity can coexist at varying degrees and are continuously negotiated and contested within specific ontological boundaries. Socio-political organization in Bronze Age Sardinia has been viewed, largely based on settlement patterns, material culture, and burial customs, in very different ways, ranging from stratified to aristocratic, all the way to egalitarian, anarchic, and acephalous. In this paper, embracing the more flexible ontological perspective of 'house society', we present the results of an attempt to explore the social and political organization in Bronze Age Sardinia through the quantification of architectural elements in the landscape. The ratios of nuraghes (with their multiple functions, including dwelling and ceremonial arenas) to burials, as well as the ratios of simple to complex nuraghes, have been calculated based on collected data across sample regions of the island. With limitations due to several types of bias, their combined patterns, alongside their territorial density, provide a basis to explore their variation as a reflection of different degrees of authority and centralization, as well as alternative, possibly competing sources of symbolic power within the same overall belief system.

11:30 *Marina Gallinaro and Alessandro Vanzetti*
Towers and packed landscapes: matching models from urban texture and Sardinian nuraghi

The distribution patterns of Sardinian nuraghi do not conform to classical hierarchical settlement models, like the ones suggested by Christaller theory; they instead show often a pseudo-random distribution, or a certain concentration in specific areas, without a clearly emerging interactive structure. It can be proposed that the 'packed' landscape is an output of a mixed effect of propagation of nuraghi as some sort of fortified farms, showing both attraction toward specific areas and some degree of repulsion to warrant the independence of each single nuraghe, also in terms of economic self-sustainment. One of the likely factors in the nuraghe spread could correspond to family/clan bonds keeping close locations when communities split and formed new units in the landscape, producing a tight and packed landscape. As a comparative model, the distribution of urban medieval towers is analyzed, as an output of an expansion of competing noble units, maintaining anyway a relevant series of reciprocal bonds, while holding interest in specific -and often the same- activity areas inside cities, like markets, political centers, etc. The urban milieu is somehow assimilated to a thick landscape, filled with obligations and constraints, as possibly the Nuragic landscape was.

11:50 *Davide Schirru and Emily Holt*
Spatial analysis as a proxy for social interaction: a case study from the Siddi plateau (South-central Sardinia)

Interpreting the spatial relationships among prehistoric sites is challenging, especially without detailed evidence for connectivity that can be provided by excavation and artifact analyses. Even when rigorous methods of spatial analysis are applied to settlement systems, the problem of equifinality is difficult to escape. How do we distinguish broad viewsheds that were intended to facilitate communication with neighbors from broad viewsheds that were intended to facilitate defense?

This contribution will examine the social significance of the Bronze Age Nuragic settlement system of the Siddi Plateau in central Sardinia by theorizing intervisibility and point pattern analysis as two axes representative of social interactions: access and information. Where high levels of clustering (access) co-occur with high levels of intervisibility (information), we see evidence for tight-knit, cooperative communities that likely shared decision-making functions. Alternatively, low levels of both clustering and intervisibility would indicate independent communities that had low levels of interaction with their neighbors, whether cooperative or coercive. This approach allows us to confidently interpret the social significance of spatial analyses while laying the groundwork for statistical comparison among settlement systems cross-culturally.

11:10-12:30 Session 27B:
In the grip of resources: Human presence in harsh environments – A case for the concept of the "resource-scape"?

CHAIRS: *Aydin Abar and Elena Silvestri*
LOCATION: U5 / 01.18

11:10 *Kamila Hanáková*
Resource-Scape of the Bohemian-Moravian Highlands (Czechia): Mineral-Driven Colonisation and the Shift to Agricultural Settlements

The study examines the transformation of the cultural-historical landscape in a selected part of the Bohemian-Moravian Highlands, focusing on medieval settlements, both abandoned and surviving to the present. Using non-invasive archaeological methods, historical sources, and cartographic data, it shows that traditional factors—such as population pressure or technological innovation—played only a secondary role in 13th-century colonisation. Instead, strategic settlement near exploitable mineral resources, especially gold, silver, and iron, was the main driver. Applying the concept of the resource-scape, the study explores how resource availability, environmental constraints, and human adaptation shaped settlement organisation. Churches and manorial sites at mining areas served as organisational and administrative centres, coordinating extraction, land management, and settlement expansion. As mining declined, many settlements quickly adapted to agriculture, ensuring long-term economic resilience. Some settlements were abandoned, while others evolved into enduring agricultural villages, preserving medieval spatial patterns and parceled hinterlands. The changing economic value of resources also influenced territorial management and property boundaries. The findings highlight a recurring pattern of resource-driven settlement and demonstrate the role of mineral availability in shaping migration, settlement, and economic strategies beyond the Bohemian-Moravian Highlands.

11:30 *Iscia Codjo, Hugo Delile, Laura Chollet, Janne Blichert-Toft, Gaëlle Granier, Clément Flaux, Fabrice Bigot, Corinne Sanchez and Jean-François Berger*
Deciphering ore supply networks and urban palaeo-pollution sources of lead in Ancient Narbonne (France): environmental and human impacts

Narbonne was a major Mediterranean port and economic hub of the Roman Empire, strategically located at the crossroads of land and maritime routes. This position inevitably fostered demographic growth and a rising demand for key resources, such as lead (Pb), while generating environmental pollutions. Fluctuations in Pb discharges downstream from urban areas, as well as the health status of the population exposed to Pb-based artefacts and related activities, can be a useful proxy for reconstructing phases of urban expansion and economic activity. Pb isotopic compositions allow us to identify direct sources of contamination within the city by comparing Pb-enrichment fingerprints in sediments and human remains with lead-based archaeomaterials, while comparison with Pb isotope databases provides insights into the broader ore-supply networks. In this study, we analysed a sedimentary core retrieved from the harbour basin of Port-la-Nautique, along with Roman lead artefacts unearthed in the city and human bones recovered from a nearby Roman necropolis (I-IVth c. AD). Samples were analyzed by ICP-MS and ICP-AES to determine elemental concentrations, and by MC-ICP-MS to measure Pb isotopic compositions. Beyond the widespread contamination of sediments and bones, the mining sources appear to vary depending on the nature of artefact, suggesting multiple ore-supply routes.

11:50 *Leopold Oertel*
Tin placer mining at the Fällbach (Western Ore Mountains) in a densely utilized mountain landscape around 1700

The Western Ore Mountain region is shaped by the legacy of various trades related to a vast number of ore deposits, woodland resources, and the use of water power. Tin placer mining, one of the dominant professions in the area for a long time, was on the verge of decline around the year 1700. More than 400 years of placer mining and the needs of more promising trades challenged the stream miners. By combining digital surface models, archival records, and archaeological survey methods, the placer mine at the Fällbach stream in the Western Ore Mountains is examined as a case study. The study reflects on the difficulties and opportunities stream miners faced around the year 1700 in a landscape deeply shaped by human action. Attention is given to the competing and occasionally cooperating types of land use and their effects on tin placer mining.

12:10 *Aydin Abar, Elena Silvestri, Luca Bezzi and Alessandro Bezzi*
Beyond efficiency: reframing copper production in the Late Bronze Age south-eastern Alps via a mining landscape

Until now, most information about Late Bronze Age copper production in the Southern Alps was coming from the large amount of smelting sites concentrated in the Eastern Trentino area. Recent investigations at Vetriolo (Levico Terme, TN, Italy) — so far, the only mining site identified to date in Trentino — have led us to the conclusion, that we need to rediscuss the way copper was produced, used and possibly valued. In mining archaeology and archaeometallurgy, past value-concepts are often equated with technical efficiency and economic surplus, leading to a purely functional modelling of a resource landscape. Bringing together archaeological and archaeometallurgical observations with landscape data, we wonder if choices in ore extraction, beneficiation, smelting, and patterns of landscape use can be reduced to concepts of efficiency alone. Read as part of a meshwork of resource-scapes, the Vetriolo evidence clarifies local modes of production and reveals how mining, beneficiation and smelting were coordinated. It also demonstrates how high-altitude production sites operated self-sufficiently. Recognising this composite valuation refines interpretations of regional exchange networks in the Late Bronze Age.

11:10-12:30 Session 32B:
General session: Project highlights

LOCATION: U5 / 02.18

11:10 *Miguel Carrero-Pazos, Cristina Pérez Camacho, Alberto Esmorís Pena, Francisco Fernández Rivera, José Carlos Cabaleiro Domínguez, María José Rodríguez Malmierca, Óscar García Lorenzo and Alexis Maldonado Ruiz*
Automatic Detection of Burial Mounds Using LiDAR, Artificial Intelligence and Citizen Science. An Outline of the DISCOVER Project

The DISCOVER project integrates artificial intelligence (AI), high-performance computing (HPC), and citizen science to enhance the detection and documentation of prehistoric mounds in Galicia (NW Iberia). Despite more than 7,500 recorded sites, the sites and monuments records remain incomplete and affected by spatial inaccuracies. The DISCOVER project develops a computational framework that analyses raw LiDAR point-cloud data through active learning. Custom HPC routines enable the efficient processing of massive LiDAR datasets in several regions, preserving micro-topographic details critical for identifying archaeological features like mounds. The project plans to develop field surveys to validate AI predictions, refining the models and improving the catalogue reliability. In parallel, building on previous experiences, DISCOVER is designing a citizen science web application which will allow users to explore LiDAR-based visualisations and report potential new sites, fostering engagement in heritage discovery and monitoring. By combining computational archaeology with public participation, DISCOVER demonstrates an innovative, scalable approach to mapping and understanding prehistoric landscapes across Atlantic Europe.

11:20 *Ana Vallarino Katzenstein*
Cultural landscapes associated with the ombú tree (Phytolacca dioica) in the River Plate region

The distinction between the notions of exotic and indigenous flora goes hand in hand with the intersection of socially defined spatial and temporal coordinates. Likewise, the notion of landscape that frames us implies an articulation between human practices and representations and nature. In this context, it is interesting to analyze the case of the tree species Phytolacca dioica (ombú), whose development has been associated with the civilizing process of the humid pampas in general and, in particular, with the anthropization of rural and urban areas. This has occurred both through direct human actions and indirectly, for example, in relation to livestock routes. It has left its mark on territorial, urban, architectural, and landscape practices, as well as on artistic representations (painting, literature, music), the collective imagination, toponymy, and the natural and cultural heritage of Uruguay, Argentina, and southern Brazil. Using an ethnobotanical approach, an interdisciplinary and transdisciplinary study will be conducted, in which the ombú trees will serve as the end and the means of this sensitive approach to nature, highlighting values associated with our ways of living and our landscapes of yesterday and today.

11:30 *Catalina Munteanu*
Modern modelling techniques unlock the potential of analogue historical remote sensing data

Remote sensing data are important for assessing landscape change, but their value is often restricted by their limited temporal or spatial coverage. Major historical events that affected contemporary landscapes such as those associated with colonial history, World War II, or the Green Revolution are not captured by modern remote sensing. In the poster, based on global case studies, we highlight the potential of declassified historical military satellite photographs from the Cold War Era to enhance or contextualize contemporary landscape patterns and illuminate time-lags or legacy effects. While these data have been long available, their use today is finally streamlined by the methodological advancements offered in the field of data processing. We show that by employing novel modelling techniques, historical satellite photography can be used to monitor landscape patterns, archaeological sites or historical human pressures on the environment.

11:40 *Pieter Rodts*
Re-membering the Sonian Forest (Belgium): Entangling Human and Non-Human Cultural Landscapes in the Anthropocene

In the 18th century, Governor-General Charles de Lorraine of the Austrian Netherlands reshaped the Sonian Forest (Belgium) into a highly engineered hunting landscape. Straight, sloped paths and crossroads optimized royal hunts, transforming forest ecologies by facilitating the pursuit of deer and boar. Today, these same paths structure human recreation, continue to influence wildlife homescapes, and shape biodiversity, enabling both disturbance and refuge.

Drawing on this case, I introduce two conceptual tools for landscape archaeology: re-membering and feral archives. Re-membering considers landscapes as biographies of human and non-human relations. The concept assists understanding processes of remembering and membering through which humans, animals, and infrastructures co-constitute environments. Feral archives describe how once-curated infrastructures, such as hunting paths, persist materially and ecologically after their original use, entering new assemblages of human-non-human interaction.
This perspective reframes "human versus non-human cultural landscapes" as intertwined continuities of design, adaptation, and afterlife, inviting a more-than-human reading of landscape agency in the Anthropocene. By combining archaeological and archival sources with ethological information on how animals influence the design and their adaptation to more-than-human landscapes, I further interrogate the boundary between human and non-human landscape engineering.

11:50 *Roberto Malinconico, Annalisa Treglia and Enrico Lucci*
Digital Reconstruction as an Analytical Tool for Evaluating the Environmental Footprint of Prehistoric Settlements

This paper explores digital reconstruction as a scientific tool for understanding the environmental impact of prehistoric settlements. Focusing on Posta Rivolta (Foggia), an early Bronze Age site, we examine how digital reconstruction functions as an analytical instrument for investigating relationships between anthropic structures and the environment. Our methodology employs a rigorous, verifiable procedural system ensuring complete connection between archaeological data and digital counterparts. Using open-source tools, the process advances from digital anastylosis to three-dimensional mesh generation, enabling quantitative material analysis, forest resource impact calculations, and ecological footprint assessments. Results suggest that methodologically rigorous digital reconstruction enables quantification of otherwise difficult-to-estimate environmental parameters: wood material volumes, natural resource consumption, and local ecosystem effects. Scientifically grounded digital reconstruction transforms from visualization tool to virtual laboratory of inquiry. Integration of quantitative data from 3D meshes opens new perspectives on prehistoric settlement dynamics and human-environment relationships, highlighting digital reconstruction's analytical potential in contemporary archaeology.

12:30-14:00 **Lunch Break**

14:00–15:40 Session 4A:
Phenomenology of Vertical Spaces:
New perspectives on the archaeology of cliffs, shafts, and chasms

CHAIRS: *Uri Davidovich and Micka Ullman*
LOCATION: KR12 / 02.18

14:00 *Dimitrij Mlekuž Vrhovnik*
Where the Earth Turns Inside Out: Folding, Ritual, and the Škocjan Landscape

This paper explores the Škocjan Caves as a "folded landscape," where the earth bends into itself and the underworld rises to the surface. In this striking terrain of chasms, dolines, cliffs, and underground rivers, the boundary between inside and outside collapses; landscape and underworld are no longer opposites but continuous folds of the same material body. Engaging with Deleuze's notion of the fold and archaeological ideas of the natural place, I argue that such vertical topographies are more-than-human actors, working through affective and material force of the place itself.

At Škocjan, prehistoric communities confronted a landscape charged with inhuman vitality; floods, dissolution, collapse, catastrophic flood. Ritual practices, processions, sacrifices, and the construction of boundaries, sought to contain this excess and to harness the power of the fold. The caves became foci where the human and the non-human, the sacred and the abject, intertwined. Ritual thus emerges as a means of keeping the landscape's chaotic generativity at bay, of maintaining distance from what was both life-giving and dangerous.

14:20 *Micka Ullman*
Into the Abyss: Human Engagement with Vertical Subterranean Space in Late Chalcolithic Galilee

Human use of caves is well attested from the earliest stages of prehistory, yet activity within subterranean spaces characterized by extreme and dramatic verticality is rare. Berenike Cave, located in northern Israel on the eastern shore of the Sea of Galilee, presents an exceptional case in which Late Chalcolithic activity (ca. 4500-4000 BCE) extended into the deep underground, involving the negotiation of vertical shafts and abysses. An elaborate system of stone-built walls was constructed within the cave to define activity areas, facilitate movement through vertical sections, and create horizontal working surfaces, sometimes suspended above life-threatening chasms. Beyond the fundamental question of why people chose to operate in the dark, inaccessible depths of the cave, Berenike Cave underscores the archaeological significance of human engagement with vertical environments. The site invites reflection on the social perceptions, sensory experiences, and psychological dimensions of a community that invested considerable physical—and likely emotional—effort in organizing and domesticating a space that was both hazardous and profoundly alien.

14:40 *Leo Klinke*
What's on the Horizon? Skyline-Effects and Quasi-Skylinie-Effects in Landscape Perception

New research on Westphalia's best-preserved megalithic tomb 'Große Sloopsteene' has shown that this late Neolithic monument was built in visual connection with a natural sinkhole. The entrance to the megalithic burial chamber was oriented directly towards the sinkhole. The distance between the structure and the sinkhole is particularly noteworthy: using reconstructed body heights, it was possible to simulate the view from the entrance. It turned out that the natural phenomenon was particularly prominent on the horizon in the so-called skyline effect. Visibility analyses suggest that the placement of the megalithic tomb was deliberately chosen in relation to this natural feature within the local topography. Interestingly, the people did not integrate the sinkhole into their architecture, in wich they merely referred to the natural phenomenon and remained rooted in their socio-cultural traditions of the Funnel Beaker Westgroup. The proximity between the monumental structure and the sinkhole indicates a perceptual and symbolic connection: the depression may have been interpreted as a threshold between the world of the living and the realm of the ancestors. In later times, Metal Age barrows were erected in the vicinity of the megalithic tomb and the sinkhole. Thus, the natural sinkhole constituted the sepulchral landscape for millennia.

14:00–15:40 Session 5C:
Marginal economies or economies on the margins?

CHAIRS: *Agostino Sotgia, Dario Monti, Elena Scarsella*
LOCATION: U5 / 02.22

14:00 *Robert Staniuk, Jan Romaniszyn, Jutta Kneisel, Johanna Brinkmann, Hendrik Raese, Mateusz Drewicz, Oliwia Kubiak, Mateusz Jaeger and Jakub Niebieszczański*
Marginal zones of maximal effort – uncovering the fortified settlement in Smuszewo and its landscape

The Early Iron Age in North-Central Poland (800-600 cal BCE) is a period of dynamic population aggregation in a previously marginal area. This process culminated in the emergence of Biskupin-type fortified settlements, unique examples of high-density urbanism (HDU) in wetland areas with limited (if any) evidence of social inequality. The novelty of this settlement system relied on the successful design of settlement infrastructure (pathways and gangways, gates, ramparts, breakwaters) as well as living quarters, which required careful planning and execution in a highly waterlogged environment. One of the most successful of these settlements was Smuszewo, where previously unpublished excavations have provided sufficient resolution to investigate this habitation process bottom up. In our paper we will present the combined new results from the non-invasive prospection (geomagnetic and georadar) and the re-evaluation of legacy data from Smuszewo to provide a first high-resolution characterization of the settlement components and their construction sequence. The discussion of the results will explore the socio-environmental impact of this community on the landscape and how it transformed from a marginal area to a crucial population center.

14:20 *Margriet Haagsma, Sophia Karapanou, Magie Aiken, Gino Canlas, Elisabeth Dotsika, Myles Chykerda, Sandra Garvie-Lok, Edward Middleton, Arshdeep Kaur, Giorgos Toufexis, Grigoris Tsokas and Adam Wiznura*
Peripheries as areas of Centrality: the Central Achaia Phthiotis Survey

The Central Achaia Phthiotis Survey (CAPS) is a collaborative project between the Ephorate of Antiquities of Larissa, Greece, and the University of Alberta, with support from the Canadian Institute in Greece. CAPS investigates the landscape surrounding the 4th-2nd century BCE settlement of Kastro, situated in the region of Achaia Phthiotis, a perioikos, occupying the mountains and foothills at the outskirts of the Thessalian plains. This relatively unexplored area lies at a crossroads between northern and southern Greece, plains and mountains, and coastal and inland regions. Its terrain features valleys, rolling hills, and waterways such as the Enipeus River and the Kotsiloremma. Using a variety of research strategies, including intensive and extensive surveys, LiDAR, geomagnetic survey, stable isotope analyses, and excavation, CAPS seeks to deepen our understanding of how environmental, geopolitical, economic, and social factors shaped the communities inhabiting this region over time. Despite the extensive alteration of the landscape since the 1960s, our data show a robust archaeological record testifying to the long-term human occupation of this region. By mapping this „marginal" boundary zone, the project aims to identify patterns of connectivity, continuity, and diachronic change across the landscape, and aid in the documentation and preservation of its archaeological heritage.

14:40 *Giordano De Coste, Matteo Rossi and Fernando Moreno-Navarro*
Centrality of the margins: the case study of Pratone di Monte Gennaro (Monti Lucretili, Italy)

The Pratone di Monte Gennaro is a grassy karst plateau located at 1,024 m a.s.l. in the southwestern sector of the Monti Lucretili, a mountain district lying roughly 60 km northeast of Rome. Positioned at the margins of this mountainous landscape, the Pratone appears, at first glance, to lie outside the main settlement dynamics that shaped the area between the Middle Ages and the early modern period. However, a combined analysis of written and oral sources, supported by GIS-based modeling of human mobility, suggests that this apparent marginality in fact conceals an unexpected centrality within the agro-pastoral taskscape of the Monti Lucretili. Our paper aims to demonstrate that, during the Middle Ages—and possibly beyond—the Pratone might have functioned as a hub of intense and shared human activity within the wider Monti Lucretili upland economy. Serving as a focal point for common vertical transhumance practices, this extensive grazing area might have supported seasonal forms of settlement that emerged from the complex interplay among the mountain community. Rather, its exploitation seems to have been characterized by a collective use of space fostered by traditions rooted in communal habits that continued to influence the local land-use patterns, until very contemporary times.

15:00 *Ambra Idone, Gabriele Sartorio, Natascia Druscovic, Giovanni Thumiger, Marco Rivolta, Aline Pons, Marco Maron Pot, Matteo Garbarino, Michele Freppaz, Emanuele Pintaldi, Flavio Ruffinatto, Alan Crivellaro, Alma Piermattei, Michele D'Amico, Guido Stefano Mariani and Walter Finsinger*
So close, so far: medieval to present adaptations to marginal landscapes in the Western Alps (DAHU project, NW Italy)

This contribution reports on the discoveries from an in-depth multidisciplinary study conducted within the the Interreg Italy-France ALCOTRA project DAHU, on the medieval to present human dynamics in the San Grato Valley, a small side valley located in the Western Italian Alps. This location is peculiar as it belongs to a German linguistic minority area, inhabited by Walser populations from the 13th century onwards. It also represents a marginal environment inside a surrounding more hospitable landscape, due to its difficult topography and limitations in the amount and quality of exploitable land and resources. The Valley was almost completely abandoned during the 19th century, with only a few mountain pastures still exploited today. Archaeologists, historians, linguists, specialists in rural architecture, forest ecologists, soil scientists, wood specialists, geomorphologists, and paleoecologists are collaborating to produce an accurate landscape-scale analysis of the strategies adopted in time by the inhabitants of this valley to face environmental, climate, and social changes. The ultimate goal of the project is to understand how climate influenced the behaviours of Walser populations and how their traditional activities (e.g., agriculture, forestry, animal grazing) impacted the landscape with both temporary interventions and more permanent landmarks (e.g., terraces, charcoal kilns, stone walls).

15:20 *Edoardo Vanni, Francesca de Pieri, Federico Saccoccio and Simone Zocco*
Margins of Resilience: Long-Term Economies and Commons Management in the Monti Aurunci (Southern Latium)

This paper explores the Monti Aurunci, a mountainous region of Southern Latium, as a case study for understanding long-term economic dynamics in landscapes often labelled as marginal. Through an interdisciplinary approach combining historical cartography, archival analysis, and archaeological survey, it examines how local communities have managed and reconfigured collective resources—forests, pastures, and water systems—from the Roman period to the modern era. Rather than peripheral or static, the Monti Aurunci emerge as a resilient socio-ecologic system embedded in wider regional networks connecting the Tyrrhenian coast and inland Apennines. The paper traces continuities and transformations in the governance of common lands, showing how practices of cooperation and negotiated authority between state power, seigneurial, ecclesiastical, and civic actors shaped a distinctive highland economy. In dialogue with broader European studies on commons and marginal ecologies, this contribution argues that the Monti Aurunci exemplify a "longue durée" of adaptation, where environmental constraints fostered innovation, collective agency, and enduring forms of territorial entaglement.

14:00–15:40 Session 12C:
Abrupt Environmental Change of Human-Environmental Systems in the Sedimentary Records

CHAIRS: *Ayaka Nguyen, Sara Saeidi, Stefan Dreibrodt, Giulia Di Giamberardino*
LOCATION: U5 / 00.24

14:00 *Hans von Suchodoletz, Birgit Schneider, Anna Skokan, Bruno Glaser, Steven Polifka, Katja Wiedner, Frank Schlütz, Torsten Schunke, Teresa Nitz and Peter Kühn*
Human influence on Central German Chernozems/Phaeozems since the Early Bronze Age

Humus-rich Chernozems/Phaeozems are among the most fertile soils of the world, and are used for agriculture since millennia. The westernmost continuous Chernozem/Phaeozem region of Eurasia is located in Central Germany. Unlike in other Central European regions where Chernozems/Phaeozems are of anthropogenic origin, their formation here can be related to natural factors. Their formation started prior to regional Neolithic settlement at latest during the early Holocene, and lasted until about 6-5 ka when the climate became more humid. Human influence started during the Neolithic about 7.5 ka, and strongly intensified since the end of the 19th century CE due to the industrialization. We systematically compared the properties of a Chernozem that was buried by the Early Bronze Age burial mound Bornhöck ca. 3.8 ka ago and is consequently largely preserved from subsequent soil forming processes and human influence, with those of a neighboring Chernozem/Phaeozem that was continuously exposed to natural and human processes until today. Our goals were to identify: (i) natural soil formation processes affecting regional surface soils since that time, and (ii) the consequences of human influence on Central German Chernozems/Phaeozems during/since the Early Bronze Age, and especially the short-term but significant environmental impact of the industrialization.

14:20 *Mattias Sjölander, Nick Schafstall, Scott Cocker and Philip Buckland*
A bug in the system: a Big Data approach to beetle diversity and environmental change on the British Isles

With the rise in large-scale meta-analysis in ecology, using existing and open data, there have been significant advances made in reconstructing Late Quaternary climates and environments in Europe. Large-scale pollen-based modelling approaches have been employed to reconstruct the development of the Holocene landscape, highlighting periods of increased human influence. In comparison, there has been less advancement made in the use of subfossil insect data to perform similar large-scale reconstructions, despite the insights they provide into past human-environment relationships. This is not for a lack of data, as open infrastructures for this purpose already exist. This presentation uses the online Strategic Environmental Archaeology Database, SEAD, to examine biodiversity trends of beetle communities within the United Kingdom and Ireland during the 16 000 – 0 BP period. Using a meta-analysis approach, we aggregate data from 108 sites across the British Isles and contextualise key periods of environmental and climatic change, including human-driven processes, from a biodiversity perspective. Using modern reference data, environmental reconstructions are informed based on individual insect habitat requirements which can highlight the increased human influence during the Late Holocene, especially following 4 500 BP; reaffirming other evidence of the increased agricultural impact on the British Isles.

14:40 *Ayaka Nguyen, Sara Saeidi and Stefan Dreibrodt*
Structured Discussion 2: "How Do Brief Environmental Shocks Reshape Societies?"

15:00 *Ayaka Nguyen*
Final Plenary Discussion (Moderated): Session synthesis linking climate forcing, landscape processes, human agency, and risk

15:30 *Ayaka Nguyen, Sara Saeidi, Stefan Dreibrodt and Giulia Di Giamberardino*
Closing Summary

14:00–15:40 Session 9C:
Settlement dynamics in floodplain landscapes

CHAIRS: *Iris Nießen, Martin Offermann, Jens Schneeweiß, Johannes Schmidt, Alexander Voigt*
LOCATION: U5 / 01.22

14:00 *Christoph Zielhofer, Marie Kaniecki, Anne Köhler, Vera Seeburg, Arnela Rollo, Laura Bergmann, Stefanie Berg, Barbara Stammel, Rita Gudermann, William J. Fletcher, Ulrike Werban, Anja Linstädter and Natascha Mehler*
Great transitions in Donaumoos land reclamation (Bavaria, Germany) since the late 18th century – a multidisciplinary perspective

Systematic human intervention in wetlands has been taking place in Central Europe for several centuries. The Donaumoos fen in Upper Bavaria, Germany, has been cultivated since 1788, resulting in the permanent loss of its natural state. The adjacent Danube River was straightened during the same period. This study presents a quantitative reconstruction over a 235-year-long timeframe of the development of the natural Donaumoos fen and Danube River into a human-dominated landscape (anthroposphere). A multi-temporal series of old maps are used to document land reclamation in the Donaumoos and hydro-engineering activities in the Danube floodplain. The comparison of the quantitative data on the development of drainage ditch lengths with the state of research from written sources leads to the discovery of potential great transitions in floodplain and peatland changes and associated human drivers as well as consequences for society in the region. One phase of great transition with far-reaching human interventions spanned 1788 to 1794 and a second phase ran from 1907 to 1959. However, the phases of substantial transitions with river straightening, land reclamation and colonization were embedded in multi-decadal intervals of setbacks and socio-ecological stagnation.

14:20 *Raphael Pereira, Juliana De Boni and Luisa Fernandes Vieira da Ponte*
Landscape Archaeology as a Tool for Understanding Vulnerability: A Multi-scalar Analysis of the Maceió/Papicu Micro-watershed (Fortaleza, Brazil)

In urban centers of the Global South, socio-environmental vulnerability is often actively constructed through infrastructural interventions that disregard local ecological dynamics and community needs. This work positions landscape archaeology as a critical tool to dissect these processes and inform more equitable risk mitigation strategies. Using the Papicu/Maceió micro-watershed, the Maceió Creek, and the Saporé community in Fortaleza, Brazil as interconnected case studies, we employ a diachronic analysis (1945-2025) integrating historical cartography, photogrammetry, and archival research. Because much of this urbanization is relatively recent, the transformation from natural to urban environments over mere decades can be accurately traced, offering valuable insights to Global South contexts, where such rapid change is notable. The research reveals how successive infrastructural projects - driven by port expansion, demographic growth, and real estate speculation - systematically produced vulnerability by degrading environmental systems and displacing marginalized populations, thus increasing flood exposure. We argue that understanding this palimpsest of interventions is crucial for guiding effective urban planning. The potential application of Historical Landscape Information Modeling (HLIM) is proposed as a method to synthesize multi-scalar data, offering a pathway to challenge conventional planning narratives and foster interventions that mitigate socio-environmental risks in urban floodplains.

14:40 *Diego Vargas, Ámbar Pinto-Morales, Arturo Jaimes, Jesús Mora, Robert Gil Pérez, David Urretia Alcalá, Carla Jaimes Betancourt and Marcelo Sánchez-Villagra*
Research Advances on Monumental Earthworks of the Western Orinoco Llanos of Barinas, Venezuela

The Orinoco River basin is one of the most archaeologically and culturally diverse regions of Venezuela. Within this area, the state of Barinas is specially well known for its monumental earthen constructions associated with the so-called "Osoid Tradition" (2300–800 BC), which includes drained fields, mound settlements, and causeways. Our recent research documents twenty-one previously unrecorded mound complexes connected by an integrated network of causeways extending over 250 km across western Orinoco Llanos. These findings not only expand the known archaeological area of the region but challenges prevailing models regarding spatial distribution and sociopolitical organization of these earthwork-building societies. The recording of this extensive settlement network was only possible through community participation which also enriches our understanding of past territorial practices. Drawing on new field observations we propose fresh hypothesis concerning the roles of these constructions in riverine landscape domestication, agrarian strategies, and the possible emergence of low-density urban configurations. Finally, we outline future research directions—including chronological refinement, palaeoecological studies, and comparative analysis with other South American lowland mound-building traditions—that will help address the questions raised by the discovery of this extensive settlement network.

15:00 *Blanca Rodríguez Magem, Marco Moderato, Tasleem Abro, Muhammad Amin Chandio, Carla Lancelotti and Marco Madella*
Agricultural strategies, settlement sustainability and water dynamics in the ancient Indus Valley

Hydrological dynamics are important to understand the relationship between human settlements and their capacity for agricultural resilience. This contribution, as part of the Modelling the Agricultural Origins and Urbanism in South Asia project, studies this relationship in the Bronze Age of the Indus Valley (modern Sindh, Pakistan). This work focuses on three settlements that are located in different environmental areas of the Indus basin. Bhando Qubo sits in the middle of the floodplain, Taloor Jee Bhit is at the edge of it near the Tar desert while Mugli is in the valley of a seasonal river feeding the Indus alluvial plain. The bioarcheological data is here contrasted with landscape data arising from remote sensing tools, normalized indexes like NDWI and NDVI and digital elevation maps, followed by a HEC-RAS model of the water flows closer to the settlements. Our work will model hydrological features such as water bodies, channels and their characteristics in deep time. By reconstructing hydrology and potential past land use patterns, this study explores whether changes in water availability fostered distinct agricultural strategies and influenced the sustainability of local settlements.

14:00–15:40 Session 25C: Past and Present Perspectives on Geopolitical Landscapes

CHAIRS: *Eduardo Herrera-Malatesta, Jesus García-Sánchez and David González-Álvarez*
LOCATION: U5 / 01.17

14:00 *Fernando Moreno-Navarro and Matteo Rossi*
Mobility Networks and the Shaping of Rural Landscapes in the Roman World

This paper explores how rural and mountainous landscapes acted as settings where different forms of access and territorial management changed over time. Through a critical dialogue with various theoretical models—such as the centre–periphery model—we propose an interpretation of territorial management based on the interaction between multiple scales. To this end, we use two micro-regional case studies: one in the very centre of the Iberian Peninsula, and another in a mountainous area of Latium, Italy, the Monti Lucretili. Network models were calculated using cost layers derived from topography. In this way, we move beyond state infrastructures and highlight the persistence of secondary and local routes that sustained agricultural, pastoral, and extractive economies. In both landscapes, secondary roads and mountain paths structured connectivity and access to resources. They articulated peripheral spaces with their own dynamics, detached from urban logics. We argue that these configurations reflect multi-scalar territorialities, in which authority over space is distributed among different agents—state, municipal, and local—and where the landscape materialises these different levels of authority through its spatial organisation. The comparison between the Iberian and Italian cases rethinks urban-centred narratives and underlines the role of rural environments in shaping the ancient Mediterranean landscapes.

14:20 *Eduardo Herrera-Malatesta*
Simulating Geopolitics: Computational archaeology as a decolonial practice

This paper explores how computational modelling can serve as a decolonial practice to reassess and recontextualise the geopolitics of pre-Columbian and colonial landscapes. Using two cas studies from Latin America and the Caribbean, it examines how spatial interaction models, movement dynamics, and network simulations can reveal alternative territorial configurations and political dynamics obscured by colonial historiography. By integrating archaeological, environmental, and ethnohistorical data, these simulations move beyond linear narratives of domination and resistance, instead foregrounding the relational and multiscalar nature of Indigenous polities. The paper critically reflects on how the epistemic foundations of computational archaeology, quantification, prediction, and abstraction, can be re-appropriated to expose and challenge the colonial logic embedded in traditional models of territoriality. Situating this work within broader debates on digital ethics and decolonial methodologies, the paper argues that simulations are not neutral reconstructions but interpretive acts that can destabilise entrenched narratives and invite plural understandings of past geopolitics.

14:40 *Giacomo Fontana and Alessia Prioletta*
Geopolitical Landscapes in Pre-Islamic Arabia: Territorial and Route-Based Inscription Strategies at Hima

This paper analyzes 22,209 rock art inscriptions from 1,793 panels at Hima, southwest Arabia, revealing competing geopolitical strategies in a landscape of overlapping territorial and mobile populations. Using spatial point pattern methods and GIS-based environmental modeling, we demonstrate that Himaitic and South Arabian script users inscribed according to fundamentally different spatial logics. Himaitic script users employed territory-based placement at higher elevations, away from natural corridors, marking likely residential zones. South Arabian script users used route-based placement on natural movement corridors, marking waypoints on larger networks. The two scripts show negative within-panel association and significant spatial segregation, suggesting maintained political boundaries despite landscape overlap. Mixed panels occur at high-visibility interface zones, interpreted as contact points where territorial and mobile groups negotiated shared space. Environmental analysis shows South Arabian panels are positioned on optimal travel routes with significantly higher visibility and corridor proximity. This case demonstrates how spatial analysis of inscription practices reveals geopolitical landscapes as contested spaces where power, mobility, and resistance are materially expressed and negotiated.

15:00 *Eduardo Herrera-Malatesta, Jesus García-Sánchez and David González-Álvarez*
Discussion

14:00–15:40 Session 23C: Geospatial Analysis in Archaeological Heritage Management

CHAIRS: *Marc Miltz, Philipp Hagdorn and Stefanie Dr. Berg*
LOCATION: U2 / 01.33

14:00 *Akinbowale Akintayo*
Land use land cover change dynamics in Sukur cultural landscape, northeast Nigeria

This study investigates trends of Land use land cover (LULC) change in Sukur Cultural Landscape - a World Heritage Site in Adamawa State, Nigeria. It consists of a hilltop settlement which is famous for strong political institutions, craft technology and trade, dating back to the 16th century CE, and an adjoining lowland settlement where inhabitants have long maintained local traditions of architecture, food, craft production and ritual. One of the criteria for its inscription into the World Heritage List in 1999 was that the cultural landscape has remained unchanged for centuries and continues to do so even when this form of human architecture is under threat in many parts of the world. The study assesses whether this criterion still holds in the face of recent natural and anthropogenic threats that have bedeviled the cultural heritage site. The study employs the use of earth observation data in QGIS to analyse landscape changes between 2009 and 2024. Results of the study showed significant change in built-up areas as most of the unique vernacular architectures have been transformed into aluminium roofing structures which the study found out to be as a result of the impact of climate and lifestyle changes of the inhabitants.

14:20 *Susan Curran, Linda Shine and Lesley Davidson*
Integrated geospatial approaches to understanding, managing, and preserving The Hill of Tara, an Irish archaeological complex

A national monument in State care and part of a serial transnational nomination for UNESCO World Heritage status as one of 'The Royal Sites of Ireland', the Hill of Tara, Co. Meath is one of Ireland's most enigmatic archaeological complexes, featuring a range of archaeological monuments and evidence from the Neolithic onwards. Interest in the site has spanned several centuries as we try to understand how the complex evolved and was used over its long history. Non-invasive techniques including topographic survey, aerial and ground photography, 3D photogrammetric and laser scanning, lidar, and geophysical survey were employed at Tara by The Discovery Programme (with several research partners) over the course of a 30-year research campaign. The resultant rich corpus of geospatial data was fully integrated into a GIS enabling comprehensive analysis. This provided a more complete map of the complex, facilitating informed decision-making on the management of this publicly accessible site by the National Monuments Service and the Office of Public Works. This paper outlines the importance of sustainable digital infrastructures in safeguarding cultural heritage, highlighting the practical challenges associated with site management and preventive protection while also ensuring long-term digital curation of data to facilitate enriched interpretation and collaborative research.

14:40 *Christiane Hemker*
The ArchaeoTin-Project. Early placer mining in Saxony – Or how to deal with 500 archaeological relics of open-cast mining

Ever since the Archaeological Heritage Office Saxony discovered a Bronze Age tin placer relic in the Ore Mountains in 2018, research also focused on placer mining for tin. Nearly 500 of these relics, where large quantities of placer tin were mined from Bronze Age up to Modern times, are recorded so far. Their dimension ranges from 0,5 up to 20 hectares and are mostly covered by forest today. Since 2009 many of the tin ore relics are part of the UNESCO World Heritage "Oremountain Mining Region" and are important for European mining archaeology research. One of the objectives in the ongoing ArchaeoTin-Project is to record, explore and interpret the relics via remote sensing methods, to obtain reliable and detailed insights into their extent and chronological classification. Therefor the DTM-based method of "horizontal stratigraphy of extraction areas," was developed for distinguishing extraction areas, phases and archaeological features in the often difficult to grasp terrain relics. The latest LiDAR data and DTM modelling facilitated the archaeological classification of features in the tin placer relics, which are additionally supported by newest C14 data and a wide spectrum of minimal invasive methods and analyses, to preserve and classify these archaeological monuments for heritage protection.

15:00 *Christopher Bodine, Daniel Pierce and Cora Darmody*
Modeling 300 Years of Land Use Change at Cahokia Mounds: Implications for Heritage Preservation

The ancient city of Cahokia, near present-day St. Louis, Missouri, stands as one of the most complex pre-Columbian urban centers north of Mesoamerica. Yet this UNESCO World Heritage site faces growing threats shaped by 300 years of cumulative land use change driven by colonial settlement, agriculture, industrialization, infrastructure development, and urban expansion. This study presents a diachronic model of land transformation in and around Cahokia, integrating historical maps, aerial imagery, remote sensing data, and archival land records to trace landscape change from Indigenous management through colonial settlement to modern urbanization. Using spatial change detection and landscape metrics, we quantify 300 years of transformation and evaluate correlations between land use dynamics and archaeological preservation, focusing on mound erosion, plowing damage, and impacts from subsurface and surface infrastructure. Beyond documenting loss, we examine the politics of preservation, how selective protection and neglect reveal shifting cultural valuations of Indigenous heritage. We conclude by identifying "heritage-critical" zones most at risk and propose landscape-scale management strategies that merge archaeological sensitivity with ecological restoration and urban planning tools, including zoning reforms, buffer zones, and green infrastructure to mitigate future threats.

14:00–15:40 Session 20A:
The Future of Landscape Archaeology in the Anthropocene

CHAIRS: *Sjoerd Kluiving, Pilar Diarte-Blasco, Joris Aarts, Anneli Ekblom, Wolfgang Alders, Thomas Meier, Paul Lane*
LOCATION: U5 / 02.17

Damián Romero Perona, Santiago Tuñas Corzón, Juan Luis Pecharroman Fuente, Nekbet Corpas Cívicos, Brais X. Currás Refojos, Pilar Diarte Blasco, Isabel Fernandez Urbina, Alicia Hernández Tórtoles, Almudena Orejas Saco del Valle, F. Javier Sánchez-Palencia Ramos and Inés Sastre Prats
Current Problems and Future Challenges in Landscape Archaeology: an overwiew from the EST-AP Research Group (Institute of History, IH-CSIC)

Since the 1990s, the EST-AP research group has studied Iron Age and Roman societies in NW Iberia, focusing on agrarian and gold-mining landscapes. Understanding space as a social construction and a heritage value in itself, rather than a passive background where social relations unfold, has been a major concern and goal in Landscape Archaeology. Decades of continuous work have produced several milestones in this regard, including the declaration of Las Médulas as a World Heritage Site in 1997. Since then, the area has suffered a series of challenges usually ending up in conflict with the Administration and, consequently, in abandonment and preservation damage. Much of the "protected" area of Las Médulas was severely affected by last summer's wildfires. This event invites us to reflect on the role that Landscape Archaeology can and should play in discussions about the future of these territories. Through its ability to integrate historical time, environmental transformations, and social dynamics, Landscape Archaeology offers a critical perspective for rethinking the management, sustainability, and heritage value of cultural landscapes. It contributes not only to interpreting the past but also to proposing new ways for communities to relate to their environments in a more conscious, responsible, and sustainable manner.

Heleen van Londen and Sjoerd Kluiving
Community Archaeology in Rural Environments: a new perspective for the future?

In the Community Archaeology in Rural Environments (CARE) Schylge project, we explore the history of Terschelling (NL), together with residents. Everyone can participate, young and old. In the past years the project carried out an archaeological desk study on behalf of the Cultural Heritage Agency of the Netherlands (RCE) in accordance national protocol, and since then focused on various places in 2025 the archaeological national monument De Worf in Lies (Terschelling). Together with staff of two universities, the Cultural Heritage agency, students, and local citizens we explore the cultural heritage on this island. We value community archaeology as a sustainable element to bolster a local community as well as to encourage inspiration for citizen covered research agenda. Through co-creation of archaeological research, communities worldwide should embrace the democracy of taking part in local treasures that belong to certain places. We want to discuss the usefulness and applicability of community archaeology in building towards new perspectives of landscape archaeology. What can other national cultural experiences critique or add to this island place of study? Do place-based approaches always work towards better results in every cultural background? What are the best approaches in community archaeology for new perspectives for the future?

Wolfgang Alders, Jonathan Soon Lim, Logan Brunner and Dylan Davis
Tree of the African Anthropocene: Remote sensing and landscape archaeology approaches to human-baobab entanglements

Baobab trees are a crucial resource for thousands of communities across Africa today. All parts of the tree have important uses, for food, medicine, forage, cordage, cloth, mats, glue, soap, and fuel. Furthermore, many baobabs function as cultural landmarks and ritual venues. Baobab trees appear to be propagated through human activities, and are strongly associated with archaeological sites. As such, their distribution may be an enduring and overlooked Anthropocene legacy within African landscapes. However, they are increasingly threatened by rapid urbanization and intensifying land use in some regions. Climate changes leading to droughts may also be impacting baobab populations, though this remains an ongoing debate. Baobab resources are an important hedge against crop failure during droughts, so in either case, their loss also exacerbates climate-induced insecurity, especially for rural communities. Efforts to conserve and understand human-baobab entanglements are stymied by a lack of large scale, high resolution data. To address this, our paper presents efforts to merge manual digitization and deep-learning detection algorithms with satellite and drone imagery for baobab mapping in coastal Tanzania, on the Swahili Coast. Mapping baobabs can contribute to long-term archaeological understandings of Anthropocene entanglements, while simultaneously aiding ecosystem conservation and sustainable community resource management.

14:00–15:40 Session 27C:
In the grip of resources: Human presence in harsh environments – A case for the concept of the "resource-scape"?

CHAIRS: *Aydin Abar and Elena Silvestri*
LOCATION: U5 / 01.18

14:00 *Ken Massy and Thilo Kappelmeyer*
Prehistoric tin extraction in the Saxo-Bohemian Ore Mountains and its implications – Archaeological and palynological evidence (ArchaeoTin Project)

Since the Bronze Age, tin has been an indispensable raw material, yet almost invisible in archaeological sources. This applies to its extraction as well as its further processing and distribution. A few years ago, evidence of prehistoric tin mining in the Ore Mountains (Erzgebirge) in the heart of continental Europe was found for the first time. Providing evidence of tin placer mining is extremely challenging in this harsh landscape and the first findings remained unique for a long time. The German-Czech Interreg project 'ArchaeoTin' addresses various questions related to tin placer mining in a diachronic and transdisciplinary manner. Targeted fieldwork, modern remote sensing methods, scientific analyses of tin placers and palynological analyses of bioarchives have now led to further evidence of prehistoric tin mining in the Ore Mountains. We will present the archaeological findings and the results of the landscape ecology, as they paint a picture of the phases and intensity of use as well as the associated environmental changes. The effects of resource extraction in this inhospitable area on the environment and on the social and economic spheres of interaction in the Bronze Age in the surroundings of the Ore Mountains are a key part of the presentation.

14:20 *Florian Messner, Michael Hölzl and Harald Stadler*
Forged in the Clouds of Tyrol – The Frosnitz Valley Iron Mines

As part of the ongoing Interreg project 'KLANG2 – Mines, Furnaces, Forges, Swords' (lead partner: City of Feltre), the Institute of Archaeology, together with partners in Belluno, Venice and Feltre, has set the goal of tracing the path of historical iron production from ore to finished sword in the region of the medieval and early modern age Tyrol. One focus of the Institute of Archaeology is the exploration of the mining area in the harsh Frosnitz Valley (East Tyrol). In this remote side valley, there are magnetite deposits at 2,500–2,800 metres above sea level, which have a particularly high iron content. However, due to its remoteness, there has been no large-scale mining in the Middle Ages and modern times, resulting in a unique, unspoilt mining landscape whose last phase dates back to the mid-19th century. Therefore it could serve as an example for the discussion of the concept of "resource-scape". The talk will cover the findings of our investigations and present them in line with the production chain. Starting with mining at 2,800 metres above sea level and the techniques used, processing on site, the miners' accommodation, transport to the valley and finally the smelting at the valley entrance.

14:40 *Rouven Turck*
Prehistoric copper mining in the Valais Alps? Update 2026

During the annual conference of the Swiss Society for Historical Mining in October 2023, an iron-copper mineralisation was (re) discovered in Evolène, Valais (Switzerland). This site was known to mineralogists and was exploited in the early modern period. However, the prospectors at that time did not recognise any clear traces of fire setting for ore mining. But these do exist. An ancient prehistoric use of the site is conceivable in the context of the numerous bronze finds in Valais. Long-established models and hypotheses concerning prehistoric copper mining in Valais are being updated. The paper presents the ongoing archaeological work on site.

15:00 *Aydin Abar and Elena Silvestri*
General discussion

14:00–15:40 Session 32C:
General session:
Project highlights

LOCATION: U5 / 02.18

14:00 *Andrea Ricci,*
Ahmad Azadi and Daniele Moscone
Landscape Archaeology in Kohgiluyeh, SW Iran: Tracing Human–Environment Dynamics in the Zagros Mountains

This short presentation illustrates recent landscape archaeological research in the Zagros Mountains of Kohgiluyeh region (south-western Iran). Situated at the interface between mountains and valleys, the region of Kohgiluyeh offers a rich setting to examine how past communities adapted to, transformed, and moved within complex mountainous environments. By integrating spatial analysis with material studies, palaeo-environmental proxies, and geochemical analyses, the project reconstructs the interplay of settlement, resource use and landscape change in the Kohgiluyeh region, offering new insights into long-term human-environment interaction in the Zagros Range.

This is a short presentation (Pecha Kucha format).

14:10 *Daniele Moscone,*
Hurşit Yetmen and Andrea Ricci
A Geological Reference Collection of Chert Raw Materials: Long Term Human–Environment Dynamics at Zeytinlibahçe (Birecik, southeastern Türkiye)

This short presentation introduces a study that establishes a geological chert raw-material reference collection, providing a key analytical tool for examining long-term human–environment interactions at the multi-stratified mound of Zeytinlibahçe (Şanlıurfa, Türkiye). Systematic field surveys, jointly conducted by geologists and archaeologists within a defined sample area, document the geological and stratigraphic evidence underlying primary and secondary chert occurrences in the region. Collected samples were characterized using the NM-PCI protocol, which integrates geological contextual data with macroscopic and microscopic variables (binary, ordinal, and continuous) to generate a mixed data matrix. The analysis of this dataset provides a comprehensive understanding of the availability and suitability of geomaterials for chipped stone production in the Birecik sector of the Middle Euphrates River basin. These results lay the groundwork for examining raw material procurement strategies and interpreting how economic and cultural practices at Zeytinlibahçe evolved over time in response to major occupational and environmental changes.

This is a short presentation (Pecha Kucha format).

14:20 *Marta Chmiel-Chrzanowska and Rafał Fetner*
The Princess Who Fell off the Cliff – Results of Research on a Wielbark Culture Burial from Bagicz Results of Research on a Wielbark Culture Burial from Bagicz

The grave of the so-called "Princess from Bagicz" is an extraordinary find dated to the Roman Iron Age. In 1899, a wooden log coffin containing the remains of a woman fell from a cliff near the village of Bagicz on the Baltic Sea. The paper presents detailed results of bioarchaeological and dendrochronological analyses of the burial, along with reflections on the site's exceptional location and the impact of coastal erosion on the object's state of preservation. A non-invasive research—and subsequently, excavations conducted on the cliff—are also discussed; these investigations ultimately debunked the myth of the Princess of Bagicz. All data have been interpreted within the context of the distinctive local cultural landscape.

14:30 *Gylfi Helgason and Árni Daníel Júlíusson*
The Deserted Medieval Settlement Landscape in Iceland

Iceland was predominantly rural until towns started to emerge in the late 18th and 19th centuries. Farms and the ways in which they utilised their outfields were thus of great importance in the past. Archaeological surveys over the past 30 years have produced a wealth of information on deserted medieval settlements. Sadly, this data has not been analysed in great detail. A new project funded by the Icelandic Research Fund in 2025 to explore these deserted settlements has started to interrogate this rich survey data along with new fieldwork data and analysis of medieval documents from North and South Iceland.

The aim of this short talk is to present and discuss the preliminary landscape analyses from the on-going project. It will compare the landscape settings of these deserted farms with other sites (i.e. farms and shielings), such as elevation, slope, and infield size. It will also discuss ways forward on how landscape archaeology can further our understanding of these deserted medieval settlements. These results may be of interest to international scholars thanks to the great chronology control offered by tephras, the rich medieval documents, and the good preservation of Icelandic deserted medieval settlements.

14:40 *Giuseppe Avola, Daniela Musmeci, Luciano Tranchina and Roberto Corapi*
From Searching to Sampling: Toward a Systematic Underwater Archaeological Survey Methodology for Shallow-Water Mediterranean Contexts

Shallow bays often include spaces for anchorage, maritime traffic and even reefs dangerous for navigation – along with submerged seaside infrastructures such as quays, storages and functional buildings. In these areas, multiple shipwreck depositions may coexist with differently originated archaeological material such as seafaring ceramic remains, evidence of ships lightening and over-washed material from coastal sites. Dynamics of re-distribution and re-clustering operated by strong submarine currents in shallow seabed environment – as long as modern human disturb – are intrusive factors which continuously transform the original configuration of cultural material deposits, producing nowadays multi-period and mixed-material archaeological assemblages. Based on an environmentally differentiated-transects sampling methodology, systematic shallow seabed investigation integrates direct underwater survey and spatial analysis to identify ongoing post-depositional modifications, interpret the nature of variously determined depositional events and reconstruct ancient maritime landscapes use. The methodological frame conceptually marks the evolution of underwater archaeological survey from an extensive, direct or remotely operated exploration-based technique to an intensively conducted, depositional process-oriented, seabed sampling method which involves quantification and precise artefacts positioning via predetermined scale spatial units. The paper aims to synthetize theory and application of the systematic underwater archaeological survey methodology, discussing results from recent fieldwork in shallow-water Mediterranean contexts.

15:40-16:10 **Coffee Break**

16:10–17:30 Session 4B:
Phenomenology of Vertical Spaces:
New perspectives on the archaeology of cliffs, shafts, and chasms

CHAIRS: *Uri Davidovich and Mika Ullman*
LOCATION: KR12 / 02.18

16:10 *Uri Davidovich*
The prehistory of forced displacement: Judean Desert (Southern Levant) cliff caves of the Late Chalcolithic period

Violent conflict among early segmented societies has long been central to archaeological discourse, informing discussions of social stratification, power accumulation, and cultural interactions. A recurrent feature of intercommunal conflict is forced displacement, yet archaeological identification of uprooted and displaced communities is challenging, especially in prehistory. A case in point comes from the Late Chalcolithic southern Levant (ca. 4500–3800 BC), a period that witnessed a sharp rise in sedentary populations sustained by intensified agriculture, animal husbandry, and craft specialization. These developments reflect a complex, segmented society whose components occasionally competed over material and territorial resources. Within this context, the use of inaccessible cliff caves in the Judean Desert – an arid zone separating two densely settled regions – stands out as a distinctive phenomenon. These caves have been variably interpreted as herders' shelters, cultic or mortuary sites, and temporary refuges. A comparative analysis of roughly one hundred such caves supports the refuge hypothesis, highlighting their role during episodes of social stress. This study invites a reassessment of forced displacement as a formative social mechanism in prehistory and of precipitous landscapes as active agents in shaping human responses to conflict.

16:30 *Jean-Michel Treffort*
Protohistoric vertical landscapes in south-eastern France

In the north of the Rhône-Alpes region (France), a number of sites located in vertical landscapes (cliff caves, ledges with difficult or very difficult access, chasms) have yielded material evidence of human occupation in protohistoric times, particularly during the Bronze Age. Many are known from ancient discoveries and remain poorly documented, but a few, explored more recently, have yielded evidence that provides a more solid basis for understanding the nature and function of these occupations. Through these examples, located mainly in the departments of Ain and Haute-Savoie, we will examine the reasons that led ancient populations to settle in these inhospitable places, as well as their relationship with verticality. We will then extend the comparisons to other limestone regions in eastern and south-eastern France (Jura, Préalpes, south-eastern Massif Central) in order to draw up a list of the proven or potential functions that can be assigned to these extreme sites.

16:50 *J. Marla Toyne, Armando Anzellini, Miquel Pans and Esteve Ribera-Torró*
The Liminal Cliffs of the Dead: The Diablo Wasi Necropolis and Ancient Chachapoya Mortuary Beliefs, Peru

The ancient Chachapoya peoples of Peru (800-1535 AD) created complex thanatoscapes both within and around residential centres. Bodies were seated, flexed and wrapped in textiles, and placed into either individual or collective tombs. Diablo Wasi is a large necropolis with over 60 collective cliff tombs (independent structures on ledges or enclosed natural caverns) across six vertical rock escarpments. The exposed karstic rock stands out against the lush vegetation typical of this highland cloud forest, thus drawing attention to the cliffs and the mortuary structures, many of which have elaborate architecture with red and white painted designs. The focus of our research is on the physical creation and use of these mortuary spaces while considering the experiential and ideological framework surrounding these cliff tombs. We discuss an Andean ritual framework of liminality and danger where the dead are ingressed safely and the living then egress to navigate their vertical descent from the tombs. Their technology used in the creation and use of these tombs is as yet unknown to us. This level of physical risk is circumvented for us using vertical rope progression, but illustrates the powerful motivation to establish these mortuary spaces by overcoming the dangers of the vertical environment.

16:10–17:30 Session 5D:
Marginal economies or economies on the margins?

CHAIRS: *Agostino Sotgia, Dario Monti, Elena Scarsella*
LOCATION: U5 / 02.22

16:10 *Giovanna Pizziolo, Wieke De Neef, Marialucia Amadio, Mauro Buonincontri, Chiara De Marco, Matteo Faraoni, Arianna Ferrero, Gaia Mustone and Carlo Tessaro*
The challenges of relict morphologies on the margins: investigating prehistoric evidence at Tombolello, Maremma district (Italy)

Relict morphologies in wetland environments present challenging contexts for investigating the landscape–waterscape relationship during prehistoric occupation. This contribution discusses multidisciplinary investigations conducted in the Bonifica di Talamone (Grosseto District, central Italy), a reclaimed former wetland area shaped by dynamic natural and social transformations. Field surveys at the former lagoonal beach ridge of Tombolello reveal long-term human use of these landforms, spanning from the Middle Paleolithic to more recent prehistoric phases. Geophysical surveys detected structures and patterns indicative of intensive occupation near an ancient shoreline. Stratigraphic studies, combined with geoarchaeological and micromorphological analyses, confirmed the presence of protohistoric combustion structures linked to productive activities, likely taking advantage of resources along ancient shorelines. The research focuses on these ecologically rich contexts, integrating remote sensing to investigate settlement organization and subsistence strategies in prehistoric wetland landscapes. Ongoing fieldwork, together with geoarchaeological analysis of proxy data and artefacts, aims to provide further evidence for understanding how prehistoric communities exploited and structured these dynamic economic spaces.

16:30 *Marcello de Vos, Mans Schepers, Matteo Cianfoni, Jan Sevink, Peter Attema and Luca Alessandri*
Living in the marshes: A multi-proxy study on the wetland settlement of Mazzocchio (Central Italy)

Wetlands have often been regarded as inhospitable landscapes, unsuitable for agriculture and incapable of supporting complex societies. Recent research, however, challenges this long-held view, revealing the economic potential of wetlands and their role in interconnected settled landscapes. A particularly illustrative case is the Pontine Plain, located just south of Rome. Historically viewed as a hostile environment, this former wetland is enclosed between a limestone mountain chain and a series of marine terraces. Over the past three decades, extensive archaeological and geological research has investigated the region's landscape development and land-use potential. Based on this, the area was considered to have been largely uninhabitable in protohistory. A recent rescue excavation revealed a pile-dwelling settlement dating to the Late Bronze and Early Iron Age, with evidence for substantial permanent occupation. These findings challenge traditional interpretations of limited human activity in the wetlands and invite a reevaluation of their role in prehistoric settlement dynamics. This paper presents the results of the excavation, complemented by geological coring, palynological analyses, and faunal studies. Together, these data illuminate human–environment interactions in the Pontine Plain and demonstrate that through adaptation, stable and successful human occupation of wetland landscapes was indeed possible.

16:50 *Alexandra Bivolaru and Enrique Aragon Nuñez*
Multinuclear realities in ancient wetland waterscapes: comparative evolution of the Venice Lagoon and Bay of Cádiz

This paper investigates the spatial organization of two coastal wetland systems, the Venice Lagoon (Italy) and the Bay of Cádiz (Spain), from a geoarchaeological perspective, focusing on the Roman period. Based on the integration of geomorphological mapping, paleo-environmental reconstruction, archaeological survey, and legacy excavation data, we explore how these environments supported distributed, polycentric waterscapes structured around hydrological connectivity and productive specialization, and where administrative hierarchies coexisted with a decentralized network of productive areas. In Venice, Holocene evolution linked to the Po and Adige deltas created a semi-enclosed lagoon gradually structured by human intervention. By Roman times, dispersed islands, salt-works, canals, and fish-farms shaped a multinuclear waterscape where power centred on Altinum. In Cádiz, post-Flandrian infilling transformed the inner bay into tidal flats and marshes. From the Phoenician and Roman periods, salt-pans, amphora kilns, and fish-salting factories occupied multiple nuclei articulated under Gades' administrative core. Through this interdisciplinary, comparative approach, we argue that productivity and accessibility determined each node's relevance within this marsh-tidal network, revealing that their strength lay in connectivity rather than centrality. Lastly, we demonstrate that these wetlands were not peripheral environments in antiquity, but structured systems with a polycentric layout.

17:10 *Michele Abballe, Federica Boschi, Marco Cavalazzi, Paolo Maranzana, Carlo Bicchierai, Maria Laura Ferretti, Enrico Dinelli and Marco Taviani*
Rethinking Marginality: Wetlands of Ravenna from the Roman Period to the Middle Ages

The notion of marginality, long associated with areas of low agricultural productivity, has been widely reassessed in recent decades, particularly in relation to mountainous regions. In contrast, wetlands—often reclaimed, drained, or neglected—have received comparatively little attention, despite their complex economic and ecological roles. With this in mind, this paper explores how wetland environments around Ravenna, a former capital of the Western Roman Empire, were inhabited, exploited, and reshaped from the Roman period through the Middle Ages. Drawing on recent results from the RecLands and Bassa Romandiola projects, our multidisciplinary approach integrates archaeological survey, geoarchaeological investigation, and historical data to reconstruct the evolution of this highly dynamic landscape. We focus on the continuity of productive activities—fishing, salt production, hydraulic management, and agriculture—within a long-term framework that emphasizes resilience and adaptation. Rather than marginal, the wetlands of Ravenna emerged as central economic spaces, where human-environment interactions generated complex systems of resource use and land organisation. By comparing the ancient and medieval evidence, we highlight both the persistence of wetland exploitation and the transformations that accompanied changing political and ecological regimes.

16:10-17:30 Session 9D: Settlement dynamics in floodplain landscapes

CHAIRS: *Iris Nießen, Martin Offermann, Jens Schneeweiß, Johannes Schmidt, Alexander Voigt*

LOCATION: U5 / 01.22

16:10 *Vudipong Davivongs, Olarn Charoenchai, Natsiporn Sangyuan, Siam Lawawirojwong and Ornsiri Panin*

Landscape Dynamics of Bangkok within the Chao Phraya Floodplain

Bangkok, the capital of Thailand, is situated along the Chao Phraya River within its floodplain. The cycle of floods and droughts has created an amphibious environment, making human settlement challenging. Adapting the landscape to this difficult setting was crucial for survival. Originally, Bangkok was a small agricultural village that grew tropical fruits to supply Ayutthaya, the former upriver capital. To defend against flooding during the rainy season and saltwater intrusion in dry periods, the flat terrain was transformed into a system of ditches and dikes, forming a poldered raised-bed orchard known as Bangkok's Inner Orchard. Bangkok residents lived in either floating or stilt houses and relied on boats as their main means of transportation. Consequently, canals were created as a network for irrigation and transport. The village then expanded into a fortress town and eventually became the capital city. The orchard landscape and canal network evolved into an urban area, with its layout still visible today. The transition from a water-based city to a land-based one has significantly diminished the original canal system. Therefore, this study references the 1887 Bangkok-Thonburi map to spatially compare the current state of former canals using geo-informatic techniques such as GIS and Google Street View.

16:30 *Iride Tomažič*

Wetland and Floodplain Communities as Crucibles of Human-Environment Interaction

Despite the popular view of waterlogged areas, archaeological evidence suggests that wetlands and floodplains provided diverse opportunities for land use, including the establishment of settlements, a wide range of subsistence strategies, innovation, and burial practices. Yet living within such environments—especially those dominated by seasonal wetlands—entailed navigating ecosystems that were both predictable, fragile, and challenging. However, how do communities navigate when such environments become unpredictable? This paper integrated human-environment-technology interactions with environmental reconstructions in order to reconstruct land-use focused on subsistence strategies and metallurgical production at two Bronze Age sites (Klárafalva-Hajdova and Kiszombor-Új Élet) located on the southeastern Carpathian basin associated with the Maros cultural group (c. 2700–1500 BCE). The data reveal remarkable stability in resource management and ecological engagement until approximately 1800 BCE, when the cumulative effects of minor climatic fluctuations, potentially compounded by social stressors, appear to have precipitated a collapse around 1500 BCE. By contributing to a broader supra-regional synthesis of wetland communities, this study sheds light on how societies inhabited and adapted to floodplain ecologies over time.

16:10-17:30 Session 23D: Geospatial Analysis in Archaeological Heritage Management

CHAIRS: *Marc Miltz, Philipp Hagdorn and Stefanie Dr. Berg*

LOCATION: U2 / 01.33

16:10 *Ana Drob and Casandra Brașoveanu*

Prehistoric Mobility and Settlement Choices in the Subcarpathian Region of Romania: Insights from Spatial and Archaeometric Analyses

In the Subcarpathian region of Romania, spatial analysis remains at an early stage of methodological and research development. The present study investigates the dynamics of prehistoric settlements from the Chalcolithic to the Hallstatt period within the Cracău–Bistrița Depression, a micro-region often described in the specialized literature as a transitional corridor across the Eastern Carpathians, though supported by limited empirical evidence. The archaeological sites identified, mapped, and analyzed so far reveal complex settlement patterns and adaptive strategies of prehistoric communities. These dynamics appear closely connected to the unique environmental context of the area, particularly to the saline springs that provided valuable natural resources and may have influenced settlement distribution and mobility. The main objective of this research is to integrate geophysical and archaeometric datasets to reconstruct possible movement routes, identify settlement preferences, and interpret the relationship between environmental factors, resource availability, and habitation choices. Furthermore, spatial analysis is employed to evaluate both natural and anthropogenic risk factors that threaten the preservation of archaeological sites. Such integrated, multidisciplinary approaches offer new perspectives on prehistoric human behavior while also contributing to the protection and sustainable management of cultural heritage in vulnerable Subcarpathian landscapes.

16:30 *Lidia Żuk*

Integrating Archaeological and State Spatial Data: Towards a Strategic Model of Heritage Management in Poland

The accelerating pace of landscape transformation in the Anthropocene exposes the limitations of traditional, site-centred approaches to archaeological heritage protection. These models are primarily concerned with protecting individual sites rather than addressing the landscape-scale processes that determine patterns and intensity of heritage loss.

Although extensive geospatial data are now available, heritage management in Poland remains only partly integrated with land-use and environmental governance. Recent initiatives—such as the National Institute of Cultural Heritage's digitisation of the Polish Archaeological Record (PAR) and its mapping portal—mark important progress towards a comprehensive geospatial infrastructure for archaeological data. However, the current emphasis on site registration should be complemented by landscape-scale analyses that integrate archaeological data with spatial information produced and maintained by national agencies (e.g. the Head Office of Geodesy and Cartography, State Forests, Polish Waters, and the Agency for Restructuring and Modernisation of Agriculture). Such integration enables predictive and preventive assessment of threats, allowing for prioritisation of survey and protection efforts in high-risk areas. The study argues that this approach would allow substantial elements of heritage management to be conducted through geospatial modelling, forming the basis for a more strategic and risk-informed policy framework suited to the challenges of the Anthropocene's 'great acceleration'.

16:50 *Diptarka Datta*

Mapping Archaeological Priority Areas as a Heritage Management Tool in Delhi, India

Delhi (28.657°N, 77.176°E), the capital city of India, has demonstrated multiple phases of human occupation, the earliest of which dates back to c. 600,000 BP (Lower Palaeolithic Period) (Chakrabarti and Lahiri, 2006). Archaeological data reported from different parts of Delhi include prehistoric findspots, excavated archaeological remains, as well as mounds dating till the early centuries BCE (cf. Babu, 2024a; Babu, 2024b; Khansili, 2014; Thakran, 2006). Although this dataset plays an important role in landscape archaeological research on Delhi, a detailed mapping of these archaeological remains is yet to be attempted. This study proposes to map Archaeological Priority Areas (APA) based on geospatial analysis of the previously reported archaeological findspots. APA is defined as a landscape unit of special archaeological significance based on known or potential archaeological remains from that area (Historic England, 2016). The primary aim of this mapping exercise is to understand the hotspots of prehistoric activity for the Delhi region. The study would address the question of how mapping APAs can act as a heritage management tool for mitigating development risks to archaeological sites (Bukhtiyar, 2025; Dasgupta, 2020).

16:10-17:30 Session 20A: The Future of Landscape Archaeology in the Anthropocene

CHAIRS: *Sjoerd Kluiving, Pilar Diarte-Blasco, Joris Aarts, Anneli Ekblom, Wolfgang Alders, Thomas Meier, Paul Lane*

LOCATION: U5/ 02.17

Graham Fairclough

Connective ideas

Even by 2010, at the first IALA conference, it had been evident for many years that major global challenges – climate, environment, inequity, geo-political conflict and many others - were growing at an increasing speed, and entangled in increasingly complex reciprocal chains of causes and effects. I spoke in 2010 at the Future of Landscape Archaeology session to suggest that landscape archaeologists must connect more with 'landscape other-ologists', helping with the emergence of a super-discipline of landscape studies. Fifteen years later it is now commonplace to meet ecologists, environmentalists, historians, sociologists and geographers (to name some) at our conferences, and to meet landscape archaeologists at their conferences; one reason for this is the interconnectedness of the crises that now face people and planet. In 2010, a European document (Landscape in a Changing World) was published setting an agenda to – in its own words – serve society in a changing world by harnessing landscape ideas to address global challenges. In 2025 we can ask, where have we got to with that?

Enrico Giorgi

Landscape Archaeology without Archaeologists?

At the turn of the last century, landscape archaeology saw a growing interest in the study of artifacts and traces left by humans. Especially in the study of classical Mediterranean landscapes, this approach allowed archaeology to break free from its dependence on Greek and Latin written sources. In recent years, however, even in the study of these landscapes, the latest research has focused increasingly on the ancient environment, which explains the growing importance of geomorphological, paleoenvironmental, and archaeozoological studies. Furthermore, on the one hand, interest in hidden landscapes such as mountainous ones and, on the other, changes in the current use of agricultural land have reduced the effectiveness of practices such as traditional archaeological surveys in favor of the development of remote sensing methodologies, including the use of machine learning and AI. In this context, the traditional skills of archaeologists need to be updated and the role of archaeologists within multidisciplinary research teams would seem to be less prominent. In light of these considerations, one wonders how the role of archaeologists should be rethought in order to keep up with the changes that are affecting archaeology

Guillermo Reher

Wake up and smell the roses. Landscape archaeology actually means caring for the world around you

Put the phone down. Look around you. Step on the ground, walk through the grass, touch the soil. It's not Thoreau, it's archaeology. By disconnecting from the internet, we can connect again with the environment, with our circumstance. Many of the challenges of the world today are either caused or turbo charged because of the former, and the solution, really, can be in the latter. Philosophers currently are emphasizing the need to re-appropriate space around us, and focus less on the tides of world opinion. Landscape archaeology is key in this, because it provides the place, and it provides the tools and technologies, that help us understand the now and the then in a place. This paper seeks to shout out to the vital role that archaeology has in re-discovering our world by providing recent examples of the vital role it is playing in shaping our future, and providing purpose in the present.

16:10-17:30 Session 32D:
General session: Project highlights

LOCATION: U5 / 02.18

16:10 *Anna-Elisa Stuempel*

Settlement history and dynamics in the Plain of Gioia Tauro from around 1000 to 250 BCE.

In this contribution, I present preliminary results from LiDAR data analyses of the Plain of Gioia Tauro (PGT) project, which is concerned with the settlement history in the plain from around 1000 to 250 BCE. Since past research largely focused on Greek migration ('colonisation') and Greek material culture, many aspects are poorly understood and results regarding (local) urban trajectories of settlements in the plain are unilaterally Greek. The research of this contribution aims at gaining a more detailed, objective, and holistic understanding of the urbanism of settlements in the PGT in the long-term. For doing so, publicly available raw LiDAR data have been collected and visualised as different models. These are used together with satellite imagery and other validation means for a macroscopic remote survey according to criteria tailored to the unique geological and geomorphological qualities of its (historical) landscape, settlement systems outlined by legacy and survey data, and theoretical subsistence strategies implied by the local historical landscape in a GIS environment. While thus far the LiDAR analysis has yielded positive results in identifying sites of potential historical and archaeological interest, it has its shortcomings too, which are (partly) resolvable by validation in the field, i.e. a pedestrian surface survey.

16:20 *Michelle Hamblin*

Stuck invite Mud; Field-walking surveys and LiDAR in French Guiana

would like to argue that using field-walking surveys and remote sensing techniques in landscape archaeology are in no way mutually exclusive but are extremely complimentary ways of doing research, especially when historical imagery is available. using examples from work done in the Approuage river valley of French Guiana. Using information from LiDAR has not only allowed us to better analyze historical landscapes, but has in many cases, given us the tools to get onsite to verify anomalies. The role of field-walking surveys will certainly evolve but for the moment remains a necessary part archaeological research.

16:30 *Juan Luis Pecharroman Fuente*

Unveiling a tragedy: Surveying a devastated Landscape. The case of the Las Médulas wildfire and its damage assessment through an aerial survey.

In August 2025, a large wildfire severely affected the archaeological and cultural landscape of Las Médulas (León, Spain), once the largest gold-mining complex of antiquity and a UNESCO World Heritage Site. The fire destroyed most of the vegetation cover, causing serious environmental damage, economic losses, and distress among the local population. The area has long been studied by researchers from the Instituto de Historia of the Spanish National Research Council (CSIC), whose work contributed to its World Heritage designation in 1997. Over the years, these studies have applied diverse survey techniques, from traditional archaeological prospection to advanced drone-based approaches. Following the 2025 disaster, the Instituto de Historia joined a multidisciplinary mission to assess the extent of the damage using UAVs equipped with RGB and LiDAR sensors. The data obtained were compared with previous datasets to quantify the loss and evaluate landscape transformations. This communication explores how aerial survey and remote sensing methods can be effectively used by the archaeological community to obtain meaningful scientific information that supports heritage monitoring, restoration planning, and the resilience of local communities facing disasters increasingly linked to climate change and environmental mismanagement

16:40 *Alessia Mandorlo*

Analyzing Archaeological Context Using Drone-based Magnetometer: The Case Study of Ancient Veii (RM, Italy)

In recent years, Unmanned Aerial Vehicles (UAVs) equipped with various sensors—multispectral, thermal, and LiDAR—have been increasingly employed in a wide range of archaeological activities. Simultaneously, there is growing interest in mounting geophysical sensors, such as magnetometers (MAG), on UAV platforms. A central challenge lies in identifying the most suitable and effective drone-based magnetometer system for archaeological applications. This paper provides a comprehensive overview of current system applications in archaeology and presents a case study illustrating an innovative use of this technology. We report on drone-borne magnetic test measurements conducted at the archaeological site of Veii (Rome, Italy), focusing on the measurement procedure and the interpretation of the results obtained.

16:50 *Astrid Stollnberger*

Roman Traces in Rural Areas - A GIS-based Analysis of Settlement Patterns in Northwest Noricum

The area north of the Alps was incorporated into the Roman Empire as early as the Augustan period during the Alpine campaigns, which led to the establishment of the province of Noricum. The topography of the region ranges from the Northern Limestone Alps in the south to the hilly Alpine foreland, characterized by large lakes and extensive wetlands and moorlands toward the north. Several central places emerged in this region, such as Iuvavum and Ovilava. In the final third of the 1st century AD at the latest, the Danube had been developed into a fortified imperial frontier. Along this so-called Danube Limes several Roman military camps have been identified. The provisioning of these garrisons depended heavily on a well-functioning agricultural system in the back country. The aim of this doctoral research is to develop a comprehensive and up-to-date GIS-based analysis of the settlement landscape and structure in northwestern Noricum, based on the mapping of archaeological finds and features as well as the modelling of an "ancient" landscape. The project seeks to contribute to a deeper understanding of the rural environment in this region and, in doing so, to shed light on its economic, infrastructural, and demographic conditions.

18:00-20:00

IALA

GENERAL ASSEMBLY

09:00-10:40 Session 18A:
Tracing back historical land-use and its legacies: common insights and perspectives of landscape archaeology and historical landscape ecology

CHAIRS: *Sjoerd Kluiving, Pilar Diarte-Blasco, Joris Aarts, Anneli Ekblom, Wolfgang Alders, Thomas Meier, Paul Lane*
LOCATION: KR12 / 02.18

Antony Brown
The Molecular Ecology of European Medieval and Historical Landcapes (MEMELAND)

This paper will introduce a recently started ERC Synergy Project (MEMELAND) that aims to apply a new approach to the evolution of landscapes and culturally-mediated biodiversity in the Medieval and Historical periods. To date we have had two methodologies – the use of documents and maps that underpin historical landscape ecology and the use of plant macrofossils and pollen that has underpinned palaeoecology. However, the application of ancient DNA from sediments (sedaDNA) is revolutionizing this field as it can go to family or species level for plants, animals, fish and even invertebrates, such as earthworms. An accompanying use of metagenomics will allow sub-species investigations of selected taxa. This paper will introduce the aims and methods of the project, its range across NW Europe and its potential to feed into critical debates about the origins and resilience of cultural biodiversity. It also aims to address key Medieval and Historical questions such as the origins of the open-field system and the effects of the Reformation across Europe. The approach is based upon metabarcoding of over 100 small-lake sedimentary sequences by a multi-country multi-disciplinary team. The outputs will range from individual species biographies to cultural landscape ensembles across NW Europe.

Thomas Raab, Patrick Drohan, Alexander Bonhage, Anna Schneider and Alexandra Raab
Tracing Land Use History: A Geopedological Approach to Legacy Effects

There is still a lack of understanding on the long-lasting impact of past land-use on modern environments. From a geopedological perspective, encompassing the integration of geomorphological and pedological approaches, the focus of research is increasingly centred on small landforms that have been shaped by historic land management practices. High-resolution Digital Elevation Models (DEMs) available today have profoundly altered our perception of the Earth's surface over the past decade. These models have exposed a widespread presence of numerous small anthropogenic forms created in pre-industrial times, a particularly notable finding in woodlands. The origins of these relict features can vary widely, along with their morphology, ranging from spot-like shapes resulting from historic charcoal burning to linear relief forms created by soil cultivation, such as lynchets, ridge and furrow systems or raised beds. In historic mining regions, relatively complex geomorphology is observed, including various landform types such as mining shafts and spoil heaps. Case studies are presented on the following subjects: Relict Charcoal Hearths (RCHs), which have been the focus of study over the past decade in the northeastern USA and Germany; land use relicts in northeastern Bavaria, with a focus on lynchets; and raised bed systems in northwestern Ireland.

Sally Corazza, Ursula Thun Hohenstein and Diego E. Angelucci
Animal Resource Exploitation from Protohistory to Roman Period at Dosso S. Ippolito (TN): Zooarchaeology for Pre-Alpine Paleoenvironment Reconstruction

Located at 871 m a.s.l. in the Prealpine zone of Valsugana (Trentino, Northern Italy), the hilltop site of Dosso S. Ippolito near Castello Tesino offers a key context for exploring human–environment interactions in mountain landscapes. This research investigates how environmental factors influenced settlement choices and animal resource management, and how these practices, in turn, shaped the surrounding landscape over time. The study focuses on the transition between the Late Iron Age (5th–1st centuries BCE) and the early Roman period (1st century CE), a crucial phase of cultural and economic transformation driven by the process of Romanisation. Its aim is to identify elements of continuity and change in animal exploitation strategies and to assess how landscape setting and accessibility affected mobility and subsistence patterns. Combining traditional archaeozoological analyses, dental wear studies, and archaeobotanical data, this project adopts an interdisciplinary approach to reconstruct palaeoenvironmental conditions and interpret adaptive strategies in Prealpine upland settings. It provides new evidence from a region where faunal assemblages have been little studied, offering insights into the dynamic relationships between human societies, animal economies, and environmental constraints in marginal landscapes during a period of transition.

Václav Fanta, Lenka Lisá and Atilla Vatansever
Rethinking the Legacy of Collectivisation: Soil Erosion and Agricultural Change in 20th-Century Czech Landscapes

The post-war collectivisation of agriculture in Czechoslovakia is often portrayed as a turning point in landscape degradation. Large-scale land consolidation, removal of hedgerows and expansion of mechanised farming are typically viewed as direct causes of erosion and soil loss. This paper re-evaluates that assumption through a multi-proxy landscape analysis of three Czech rural sites—Vanovice, Myslinka and Merboltice—representing contrasting geomorphological, pedological, and socio-historical contexts. By combining archival and cartographic data with GIS-based RUSLE modelling, field surveys, and laboratory analyses (pXRF, granulometry, magnetic susceptibility, micromorphology), we show that erosion patterns were primarily conditioned by pre-existing geomorphology, inter-war hydrological interventions, and long-term agricultural intensification rather than by collectivisation itself. In Merboltice, demographic collapse after 1945 proved more significant than agrarian policy change. The results suggest that attributing soil degradation unambiguously to collectivisation oversimplifies a complex historical process. Instead, erosion reflects the cumulative effects of multiple socio-environmental factors. This case study highlights the importance of integrating archaeological, historical, and environmental data when assessing the legacy of 20th-century agricultural transformations in Central Europe.

09:00-10:40 Session 10A:
Modelling demography through archaeological data: from theoretical approaches to global case studies

CHAIRS: *Michele Abballe, Francesca Chelazzi, Alessio Palmisano, Dan Lawrence*
LOCATION: U5 / 02.17

09:00 *Michele Abballe*
Introduction

09:20 *Dave Cowley*
Bridging the gap? Steady state populations and archaeological data in southeast Scotland

Modelling settlement data in southeast Scotland suggests that there was a 'big Iron Age', which saw population growing in the final centuries BCE. Late Iron Age population numbers may have approached those of the mid-18th century CE. However, the available evidence for modelling population between the Iron Age and the post-medieval period is extremely poor, with ephemeral building forms that are vulnerable to plough truncation and are difficult to detect, and probably a shift in settlement locations. Nevertheless, the poor archaeological evidence has prompted suggestions of marked population decline during the mid-1st millennium CE. This runs counter to the palaeoenvironmental evidence which suggests continued high levels of human impact on the landscape. With a compound growth rate of 0.022% per year for this intervening 1800 years, which is at the lower end for historical, pre-industrial societies, the period may have been marked by fluctuating population numbers. However, in part supported by the continuity of land use indicators, population numbers may have been stable – in a near steady-state condition. The implications of this for considering population models over the long term are discussed.

09:40 *Elliot Van Maldegem, Possum Pincé, Giacomo Capuzzo, Mathieu Boudin, Christian Burlet, Philippe Crombé, Isabelle De Groote, Guy De Mulder, Hannah Leonard, Christophe Snoeck, Sophie Verheyden, Marine Wojcieszak, Nathalie Fagel and Koen Deforce*
Reconstructing Demographic, climatological and Environmental Dynamics during the Bronze Age in the Belgian Meuse valley: A High-Resolution Multiproxy Analysis

The Belgian Bronze Age (ca. 2100–800 cal BC) was bookended by two Rapid Climate Change (RCC) events, the 4.2 ka and 3.2 ka events, each lasting roughly a century. Yet, their impact on the environment, mobility, and land use in northwestern Europe remains poorly understood. The Learning from the Past (LEAP) project addresses this through a high-resolution multiproxy approach integrating palaeoclimate (C, O isotopes and trace elements from speleothems), palaeoenvironmental (pollen from peat bogs), and archaeological data, including palaeomobility (O, Sr isotopes from human bones) and palaeodemography (summed probability distributions, kernel density estimates, and site count modelling). A critically evaluated radiocarbon dataset (>1,500 dates), combined with site-phase data from the Scheldt valley, enables cross-validation of SPD-derived demographic trajectories against settlement dynamics and cultural transformations. The results suggest changes in settlement density, technology, and funerary practices, as well as mobility. By statistically correlating these archaeological proxies with independent palaeoclimate and palaeoenvironmental records, the LEAP project seeks to evaluate the synchronicity and potential causal links between RCCs, environmental change and population processes. This integrated approach highlights both the potential and the challenges of combining heterogeneous datasets to assess demographic resilience and adaptive strategies in the face of climatic variability.

10:00 *Hendrik Raese*
Combining demographic proxies and predictive modelling – The Late Neolithic to the Early Bronze Age in northeastern Germany

Significant numbers of linear infrastructure developments, archaeological surveys and research projects have taken place in recent decades in the southwestern region of the Baltic Sea and north-eastern Germany. The data obtained allows the analysis of changes in settlement locations and site selection processes from the local Late Neolithic to the Early Bronze Age (2800-1500 BCE) by means of pre- or postdictive modelling. For this, not only environmental (soil type, slope, aspect, etc.) but also socio-cultural (visibility, find density, distance to reconstructed routes, etc.) variables were used as a basis. Additionally, the data is available for multiple proxies of demographic development such as aoristic analyses of the archaeological material culture, the calculation of calibrated summed probability distributions of 14C-dates and values for land openness using REVEALS modelling. In combination with the predictive models the results of localized population densities can be compared to other methods assessing spatio-temporal patterns like kernel density estimates of radiocarbon dates. Overall, this opens further possibilities of qualifying probable changes in settlement and subsistence strategy due to population pressure or climatic events.

10:20 *Detlef Gronenborn and Kai Wirtz*
A Multiscale Approach to Mid-Holocene Demography Dynamics

Human population dynamics and their internal and external drivers are not well understood, especially over the long term and on large scales. Here, we show that demographic growth trajectories of all inhabited continents from 9 to 3 kaBP reveal multicentennial and partially synchronous cycles. These continental cycles were estimated based on summed probability distributions of radiocarbon dates and, for Europe, cross-validated by archaeology-derived settlement data. The European growth cycles show a strong correlation with multicentennial variations in the stability of climate states. This continental perspective is complemented by regional and local foci. Case studies are three successive cycles around the Upper Rhine valley in western Central Europe. These are formed by the traditional archaeological phases of the Early to Young Neolithic, with Central European archaeological entities like the Linear Pottery Culture (LBK), Rössen, and Michelsberg. Local cycles indicate both synchronous but also decoupled behavior from regional and continental population cycles. A similar partial synchronicity appears at a single location of the Michelsberg culture (4200-3500 BCE), the hilltop site of Kapellenberg and its vicinity. We discuss how exogenous factors such as climate variability are amplified by endogenous factors such as phase-dependent changes in social cohesion.

09:00-10:40 Session 14A:
Re-discovering Mountainscapes:
An Interdisciplinary Approach to Mountainous Areas

CHAIRS: *José Abellán Santisteban and Ylenia Paciotti*
LOCATION: U5 / 01.18

09:00 *Stefania Fiori*
Reading Funerary Landscapes:
GIS-Based Archaeological Research in the Mountainscapes of the Southern Caucasus

The Southern Caucasus offers a unique vantage point for exploring how prehistoric communities engaged with complex highland environments – dynamic arenas of social, ritual, and environmental interaction. Within this framework, this research examines the development of funerary landscapes between the Late Chalcolithic and the end of the Bronze Age (ca. 4000–1000 BCE), focusing on how burial-mound traditions both shaped and were shaped by topographically diverse settings. Integrating archaeological evidence with GIS-based spatial analysis, historical remote-sensing data (CORONA, Gambit, Hexagon), and geomorphological information, it investigates potential correlations between kurgan placement, elevation, slope gradient, and natural resources. It also considers evidence of reuse and multiple depositional phases, tracing how communities reinterpreted and memorialised these monuments over time. Through a combination of spatial and environmental analysis, this study explores whether kurgan locations were influenced by visibility, accessibility, and patterns of movement along valleys and intermontane corridors. The mountainscapes of the Southern Caucasus are approached not as peripheral terrains but as active, inhabited spaces where environmental diversity and cultural expression intertwined, shaping enduring landscapes of memory and identity in prehistoric Eurasia.

09:20 *Enrico Lucci, Giulia Recchia, Melissa Vilmercati, Italo Maria Muntoni and Francesca Radina*
The Alta Murgia Archaeological Project: new surveys along the southern edge of the Murgia Plateau (southeast Italy)

Southeastern Italy, at the heart of the central Mediterranean, is characterised by highly diversified landscapes and dotted with hundreds of sites attesting to the exploitation of varied ecosystems from the Lower Palaeolithic to the Bronze Age. Yet the inland and upland areas, constrained by different factors—e.g. complex environmental conditions, the absence of extensive public works, and erosional processes—have been the subject of only limited archaeological projects, which nonetheless underscore their archaeological potential. Launched in 2023, the interdisciplinary Alta Murgia Archaeological Project (AMAP) investigates prehistoric settlement dynamics across the inland/upland territories of the Alta Murgia system, an underexplored area encompassing the highest reliefs of central Apulia (above 600 m a.s.l.). This karstic plateau rises gently from the Adriatic and drops steeply southward, marking the divide between the Adriatic coastal belt and the inner Fossa Bradanica plain. Our presentation outlines the preliminary results of three years of systematic field surveys in this area, which have revealed a broad palimpsest of human occupation and exploitation episodes, from the Palaeolithic to the threshold of the historical period, illustrating shifts in settlement patterns, diversified uses of ecological niches, and evidence of long-range interactions.

09:40 *Jadranka Verdonkschot, Zaira García-López, Joeri Kaal, Carlos Otero-Vilariño and Felipe Criado-Boado*
Shaping Sacred Landscapes:
The Enduring Monumentality of the Barbanza Mountain Range

Current work on the megalithic necropolis located of the Barbanza Mountain Range is offering new insights into the structuring and endurance of monumental landscapes. Combining excavation, geophysical surveys, GIS-based spatial analyses and geochemical study of soil and sediments, it is aimed to reconstruct the paleoenvironment and shed light on how this intentionally structured landscape reflects past social practices. The persistence of the Barbanza Mountain Range as a ritual landscape and its shifting significance is central to this study, which incorporates archaeological research as well as historical sources. This study explores how memory, perception, and engagement shape a mountainscape over time, offering insights into the persistent dialogue between people and places.

10:00 *Chiara Pupella*
Multidisciplinary perspectives for interpreting and regenerating Lombardy's mountain landscapes

Mountain landscapes can be interpreted as complex, long-lasting systems in which interactions between the environment, settlements and material culture generate forms of knowledge and identity. This contribution offers a reflection on the role of territorial and architectural stratigraphy as tools for understanding the transformations of small mountain centres in Lombardy and for guiding new perspectives on sustainable regeneration. The approach adopted integrates the methodologies of historical building archaeology with the interpretative categories of territorialism, in an interdisciplinary perspective that combines historical reading, ecological analysis and design. This integration allows mountain landscapes to be recognised as dynamic archives of practices, knowledge and relationships, in which the notion of heritage takes on an operational value, capable of informing local development policies and strategies. The aim is to outline a theoretical framework that interprets mountain territories as laboratories for experimentation and co-evolution between memory, environment and design, contributing to the contemporary debate on landscapes as cultural and sustainable devices.

09:00-10:40 Session 15A:
Terraced landscapes as longterm socio-ecological archives

CHAIRS: *Ralf Vandam, Soetkin Vervust, Axel Cerón González, Antony Brown*
LOCATION: U2 / 01.33

09:00 *Ralf Vandam, Soetkin Vervust, Axel Cerón González and Antony Brown*
Introduction

09:20 *Andrei Kedich, Ralf Vandam, Soetkin Vervust, Yannick Devos and Matthias Vanmaercke*
Mapping agricultural terraces at large scales using machine learning: a case study of Cyprus

Terraced landscapes represent some of the most prominent human-made landforms in the Mediterranean, playing a crucial role in agriculture, erosion control, and soil conservation, while also contributing to the region's cultural heritage. However, large-scale and systematic assessments of their occurrence remain limited. This study introduces a reproducible and computationally efficient framework for object-based detection and classification of agricultural terraces using freely available geospatial data. The framework integrates image segmentation with a two-stage machine-learning-based classification and is demonstrated for Cyprus, a representative Mediterranean island with diverse terrace morphologies. The terrace detection model achieved a Receiver Operating Characteristic Area Under the Curve (ROC AUC) of 0.86 and a normalized Matthews Correlation Coefficient (MCC) of 0.71, while the classification model, distinguishing broad, narrow, and reforestation terraces, reached an MCC of 0.75. Applying the model at the island scale resulted in a total predicted terraced area of 693 km² (7.5% of Cyprus). The resulting maps provide the first island-wide overview of terrace occurrence and types in Cyprus, revealing both active and abandoned systems. The framework is transferable to other terrace-rich Mediterranean regions and supports applications in soil erosion modeling and geoarchaeological analysis.

09:40 *Akinbowale Akintayo*
Historical development of terrace farming practices at Sukur cultural landscape, Nigeria

Sukur cultural landscape (hereafter Sukur) is Nigeria's first World Heritage Site and Africa's first cultural landscape inscribed into the World Heritage List. Located in Adamawa State, northeast Nigeria, Sukur consists of a hilltop settlement (covering about 764 ha) which is famous for strong political institutions, craft technology and trade, dating back to the 16th century CE. There is an adjoining lowland settlement, still an important residential area today, where inhabitants have long maintained local traditions of architecture, food and craft production and ritual. It is a living heritage site with cultural features such as paved walkways, unique vernacular architecture, shrines and ceramic altars, Palace of Hidi, dry stone walls, etc. One of the most important features of the landscape howeveris agricultural terraces which are as old as the site. This study employed the use of digital technology and remote sensing techniques to document the spatial distribution of the terraces across the landscape. It goes further to examine their construction, use and how they have supported the livelihood of the inhabitants of Sukur and mitigated the risks associated with soil erosion for more than 800 years.

10:00 *Ella Egberts, Andrei Keidich, Monica Alonso Eguiluz, Dita Auzina, Bruno Deslandes, Tim Kinnaird, Ralf Vandam and Soetkin Vervust*
Reconstructing water management histories in terraced landscapes using luminescence profiling and dating: a case study from the Hajar Mountains, UAE

Human–environment interactions are especially pronounced at the margins of the human habitat. Here minor environmental or climatic changes can have major impacts on human societies. In (semi-)arid regions, these interactions are shaped above all by the availability of water. The Hajar mountains, along the Gulf of Oman, is such a region, with a record of millennia of human adaptations to (hyper)aridity. The most well studied adaptations are the falaj and oasis systems, presenting technologically advanced systems of exploiting groundwater. Until now, the complementary role of terracing however, has received far less attention. This paper presents new evidence for the occurrence of terraced landscapes throughout the UAE Hajar Mountains, which were mapped using automated detection workflows applied to high-resolution satellite imagery. We focus on the terrace-system at Suheila, Hatta, where targeted fieldwork has produced the first chronometric dates alongside sedimentological and phytolith data for such features in the UAE. These results provide a chronological framework for this terrace-system and offer insights into its construction, use, and environmental setting. By situating terracing within the broader water management infrastructure of the region, we explore how communities combined technologies of differing cost, complexity, labour organisation to navigate shifting environmental and social conditions.

10:20 *Daniel Fallu, Tony Brown, Kristoffer Dahle and Marie Føreid Merkel*
Tracing Management Practices in Vertical Landscapes: Geoarchaeological evidence from Norwegian terraces

Terraces and lynchets represent an integral if under-studied aspect of the agricultural landscape in Norway, where arable land constitutes less than 3% of the land surface and the extreme topography places further constraints on the available land. On the fjord farms (ca. 200 masl) terraces stabilize and deepen soils, while on the lower-lying coastal farms (< 100 masl) they additionally provide protection from avalanches and landslides. In both cases, the accumulated soil preserves a record of the agricultural activities conducted on them and the slope conditions which impacted cultivation and management. This presentation reports the results of geoarchaeological research conducted by the ERC-funded TerrACE project on four historic farms, three in the Storfjord region of western Norway and one on the island of Andøya in the north, dating from multiple periods between the 8th to the 18th centuries CE. Results from portable optically stimulated luminescence, radiocarbon dating, portable X-Ray fluorescence and sedimentary aDNA allow reconstruction of management practices. The terrace soils preserve evidence of slope stability/instability, traces of the plants and animals raised on site, and management practices such as manuring with fish remains (gadidae). The soil record reflects changes in agricultural practices with respect to geography, topography, and time.

09:00-10:40 Session 28A:
Landscape Archaeology of Riverine Environments

CHAIRS: *Markus Fuchs, Hans von Suchodoletz, Christian Tinapp*
LOCATION: U5 / 00.24

09:00 *Markus Fuchs, Hans von Sucholodetz and Christian Tinapp*
Introduction to the session

09:20 *Gert Verstraeten, Renske Hoevers, Eline Lathouwers, Bart Minnen, Yves Segers, Bart Vanmontfort and Marleen van Zon*
From climate to human-dominated river morphologies over the last 12.000 years.

Numerous traces of former river channels are preserved in the lowland alluvial environments of central Belgium. High-resolution LiDAR-elevation data, sediment stratigraphy of channel infills, palaeoecological data and historical maps and documents provide insights into the diversity of channels preserved in the present-day landscape. Large, elongated palaeomeanders are related to the rapid climate oscillations of the lateglacial period. Early to mid-holocene rivers are either absent or small sinuous to anastomosing channels in marshes develop. This fits well into the established framework of river planform changes of many European river systems. However, with the increasing impact of humans in the landscape, different new river morphologies emerge. First, small but highly sinuous sand-bed channels develop when runoff increases following deforestation. Later on, sediment input increases and channels start to become less mobile and tortuous as cohesive sediments stabilize river banks. With further increasing sediment loads, broad-crested levees fix the river bed and more and more meanders are abandoned. The river becomes less sinuous. From the late-medieval period onwards, rivers are straightened directly to facilitate navigation. This study shows that rivers were already entirely shaped by humans before the start of engineering works and questions the concept of natural river systems on historical maps.

09:40 *Geraldine Paloma Fernandez Selaez*
The Influence of Settlements in Riverine Environments of the Casarabe Culture in the Llanos de Moxos, Bolivia

The Casarabe culture developed between 500 and 1400 AD. It was located in the southwest of the Amazon region, in the Llanos de Moxos, Bolivia. Its sites are characterized by large, planned architectural complexes with civic-ceremonial centers, conical pyramids, U-shaped plazas, stepped platforms, canals and other earth works. Recording these structures using LiDAR technology reveals the complexity of these cities, which represent a type of low-density urbanism in the Amazon. These sites were located in interfluvial environments. However, the role of sites located on the banks of the most important river in the region, the Mamoré, and its tributaries, such as the Pojige and Isiboro, remains unknown. This study examines archaeological settlements in riverine environments to the west of the Mamoré River. It analyzes the monumentality of selected sites using LiDAR maps and compares their characteristics, such as location, size, architecture, layout, and interconnectivity, with those of previously studied interfluvial Casarabe settlements. This study provides a more detailed view of the distribution and organization of Casarabe settlements over time. Through analyzing LiDAR maps, the study provides new data to better understand the architectural characteristics and territorial configuration of this culture in the Llanos de Moxos.

10:00 *Katalin Tolnai, Jan Bemmann and Susanne Reichert*
Tracing the Orkhon River: The Karakorum - Landscape Reconsidered through Historical Cartography

This paper proposes a possible reconstruction of the Mongol-period landscape patterns in the middle Orkhon Valley (Arkhangai county, Mongolia). The Orkhon Valley held significant importance already before the Mongol period, and during the 13th century, it also gave place to Karakorum, the capital of the Mongol Empire. While archaeological investigations have shed light on the remains of this city, a close examination of early modern maps reveals a landscape pattern that differs from what is visible today. By integrating historical cartographic sources, satellite imagery, and GIS-based spatial analysis, our research examines the historical course of the Orkhon River and proposes a reconstruction of how the river system may have been connected to Karakorum and its surrounding sites. The Orkhon River, as dominant hydrological feature of the region, played also a crucial role in shaping the local economy. Understanding its dynamics within the landscape also provides deeper insight into the extent and methods of local agricultural activity, which were most likely highly also dependent on the waters of this river. The research was conducted within the framework of the DFG-founded project FOR 5438 "Urban Impacts on the Mongolian Plateau. Entanglements of Economy, City and Environment (2023-2027)" at the University of Bonn.

10:20 *Philipp Garbe, Amr Abd El-Raouf, Ashraf Es-Senussi, Eva Lange-Athinodorou and Julia Meister*
Floodplains and Settlement Dynamics: Geoarchaeological Perspectives from the Nile Delta

This study presents the first area-wide geoarchaeological reconstruction of the Holocene landscape and settlement history of ancient Bubastis (Tell Basta), situated in the southeastern Nile Delta—a region shaped by complex interactions between fluvial dynamics and human activity. Based on a combination of sediment coring, electrical resistivity tomography (ERT), and direct current resistivity (DCR) soundings, six lithostratigraphic units were identified, revealing the interplay between natural geomorphological processes and anthropogenic modification. Elevated Pleistocene sand mounds (Geziras) provided flood-safe foundations for temples, palaces, and domestic quarters, while surrounding floodplain areas—fed by a major Nile branch—were used for agriculture. The southern settlement area (S1) shows anthropogenic deposits up to 9.5 m thick, indicating intensive occupation from the Ptolemaic to Roman periods, whereas the northern area (S2) remained largely agrarian. The results highlight the significance of slope–floodplain coupling, floodplain sedimentation, and topographic advantages in urban development and resilience within fluvial landscapes. This integrative approach demonstrates how geoarchaeological and geophysical data can be combined to reconstruct long-term human–environment interactions and landscape evolution within deltaic river catchments.

09:00-17:30 Session 10G:
Poster session Day 3

LOCATION: KR12 / 00.16
Francesca Romana Del Fattore

All PaTHS Lead to the Pastures: investigating ancient Apennine droveways through landscape archaeology and geosciences
Mountain environments are increasingly recognised as central cultural ecologies and "conceptual spaces" rather than marginal areas. In the Central Apennines (Abruzzo, Italy), high-elevation plateaus and passes formed strategic nodes within seasonal pastoral systems linking uplands and lowlands across millennia. This paper draws on Marie Skłodowska-Curie research (PaTHS – Pastoral Tracks Heading South. The evolution of the Droveways in Central Southern Italy) to examine how transhumant mobility structured mountain landscapes. The study focuses on five sample sites in southern Abruzzo (850-1650 m asl) – La Trinità, Feudo Intramonti, Godi Pass, Ziomas, Campo Dragone (Barrea, Civitella Alfedena, Scanno, Scontrone - Province of L'Aquila) – integrating archaeological data, historical sources, GIS and geoarchaeological analyses (OSL, LOI, XRF, FTIR, spherulites). Here, archaeological surveys have revealed a stratified Holocene landscape, with evidence ranging from the Middle Neolithic to the Medieval period. Structured pastoral routes and minor paths traverse the area, while traditional shepherding complexes — some still seasonally active — testify to enduring mountain lifeways. Preliminary sediment analyses indicate possible localised dung signatures, episodic trampling, and compaction consistent with seasonal herding. Alongside scientific data, the project engages local communities and active pastoralists through participant interviews, recognising living knowledge as a vital interpretive resource.

Carmen Aguiló Rivera
Immaterial heritage of mountainous water, collecting traditional irrigation knowledge in Spain.

Water management practices inherent to mountainous regions in Spain reflect a long-standing tradition. Through the study of this traditional knowledge and its comparison across different areas, we can understand how adaptation to the environment and local climatic specificities occurs. My research in southern and eastern Spain aims to compile a corpus of traditional irrigation practices that operate within hydraulic irrigation systems dating back to the medieval period, which remain in use today. The approach to this knowledge is developed through a methodology with a stronger anthropological focus and aims to document and compare these practices with the scientific understanding of irrigation that underpins hydrological models.

Linda Olsvig-Whittaker, Ehud Weiss, Suembikya Frumin and David Shkedi
Reconstruction of past landscapes related to Ohalo II, a 23,000 BP site on the Sea of Galilee

Ohalo II, a submerged archaeological site on the Sea of Galilee, is one of the best-preserved hunter-gatherer and first farmer sites of the Late Glacial Maximum, radiocarbon dated to 23,000 BP. It was preserved underwater within the lake and by charring, hence there is an abundance of organic material, especially plant seeds and animal remains. The plant species assemblage reflected sites in which the people gathered material. Since we generally knew the ecological preferences of the species in the archaeobotanical dataset, it was possible to compare the distribution of modern species in extensive survey records of BioGIS at Hebrew University with the species found in the Ohalo II archaeobotanical record. This comparison enabled us to estimate the kind of habitats where the people were most active in their time. We concluded that the Ohalo II people preferred to do collection in Tabor oak woodland in the uplands, and in freshwater marsh in wetlands around the Sea of Galilee.

Angélica Olmeda-Pérez
Rivers, Elevation, and the Geography of Sacred Spaces: A Spatial Analysis of Amazonian Geoglyphs

This study explores how hydrology and elevation influenced the spatial distribution of pre-Columbian geoglyphs in Acre State, Brazil. Through GIS-based analysis of river proximity and terrain models, patterns emerge showing that most geoglyphs were built within 1–2 km of major rivers and at moderate elevations along a north–south gradient. These findings suggest that ancient builders selected locations for both hydrological accessibility and topographic prominence—factors that likely shaped ceremonial landscapes, regional connectivity, and patterns of movement. By integrating spatial analysis into Amazonian landscape archaeology, this research highlights how environmental variables can illuminate the cultural logic behind monument placement and offers a methodological framework for future predictive modeling of undiscovered sites.

Maximilian Prochnow, Lisa Danius, Franziska Tarnow, Marcus Voss, Ulrike Werban, Pierre Fütterer and Hans von Suchodoletz
n-Alkanes and PAHs from sediments of a Central European upland floodplain reveal the regional Late Holocene vegetation and fire history

The Central European uplands were intensively used for human activities during the last millennium, especially since the 'Medieval Industrial Revolution'. This was fostered by the regular occurrence of metal ores and an often dense wood cover allowing charcoal production, being the preconditions for metal production. Due to the general high hydropower potential of the upland rivers facilitating mill construction, especially the upland floodplains and their surroundings were economic centers since that time. Consequently, these environments were strongly impacted by human activities in the form of e.g. economic infrastructures, overbank aggradation, heavy metal pollution, vegetation changes or fire activities. During this study we applied leaf wax-derived long-chain n-alkane biomarkers and polycyclic aromatic hydrocarbons (PAHs) to Late Holocene overbank sediments derived from the floodplain of the upper Weiße Elster River in the Vogtland Uplands (eastern Germany) as proxies for the regional vegetation and fire history. The average chain length of n-alkanes suggests a transition from deciduous trees towards grasses due to deforestation. The abundance of the PAH retene in parts of the older floodplain sediments documents the combustion of wood from coniferous forests, and a higher PAH-concentration in younger sediments suggest the increasing occurrence of fires with time.

Bastian Grimm, Christian Zeeden, Alexander Voigt, Andreas Dix, Rainer Schreg, Thomas Kolb and Markus Fuchs

Geoarchaeological perspectives on Late Holocene fluvial transformation in the Wiesent River Catchment (Bavaria, Germany)

Riverine environments are dynamic interfaces between natural processes and human activities, preserving geoarchives that record millennia of environmental and cultural change. Understanding how these systems evolved under increasing anthropogenic influence is essential for the reconstruction of past landscapes and for the assessment of long-term human-environment feedbacks. This study examines the Late Holocene evolution of the Wiesent River catchment in northern Bavaria, Germany, as a representative example of a Central European fluvial landscape increasingly shaped by human influence. By employing a multi-proxy approach using sedimentological, geophysical, and paleoenvironmental analyses with optically stimulated luminescence (OSL) dating, we establish a robust temporal framework for floodplain development. Bayesian modelling of OSL ages enables precise identification of sedimentation phases and the timing of landscape transformations. Our results indicate intensified overbank sedimentation during the last millennium, coinciding with widespread deforestation, agricultural expansion, and the installation of hydrotechnical infrastructure. Temporal lags in sediment storage reveal complex feedbacks within the sediment cascade, linking upland erosion to delayed floodplain deposition. By integrating OSL chronologies with archaeological-historical evidence, this study highlights the sensitivity of riverine landscapes to cumulative human impact and emphasizes the interpretive value of fluvial geoarchives to deliver insight into long-term socio-environmental dynamics.

Weronika Bałdyga and Julia Malinkiewicz

Following the Wierzyca: Settlement Patterns and Environmental Relations in Early Medieval Pomerania

The Wierzyca River Basin, located in the East Pomeranian Lake District (northern Poland), presents a dynamic example of human–environment interaction during the early medieval period. Approximately 30 strongholds, functioning between the 7th and 12th centuries, have been identified within this region. The earliest were founded by Slavic tribal communities, while later centres are associated with the expansion of the Piast state. The distribution of strongholds reveals a strong correlation with the hydrological features, particularly the Wierzyca River and its tributaries, highlighting the significance of waterways for communication, trade, and defense. The 1,603 km² basin is marked by varied topography, glacial landforms, and fertile valleys, once surrounded by extensive deciduous forests and wetlands. Settlement development was shaped by environmental conditions: elevated terrain provided natural protection, while abundant water resources and fertile soils supported agriculture, animal husbandry, and fishing. These patterns reflect a deliberate adaptation to the natural landscape and the strategic use of environmental advantages in the organisation of early medieval settlement systems.

Shamili Jaishankar and Ajay Kumar Rammoorthy

Archaeology of Vaigai's cultural landscape: Transition from Iron Age to Early Historic sites.

The glorious river Vayai (Paripadal -12: 98-100), today's Vaigai that originates from the Varasunadu hills of Tamil Nadu, is home to 513 archaeological sites. Vagai has always had varied climatic conditions, leading to drought and shrinkage of the river or sudden floods due to heavy rainfall. The paper argues that this has led to the deliberate selection of the landscape around the river throughout the past, particularly in the transition phase of the Iron Age to the early historic period. This study also addresses the contemporary problem of aridity by drawing parallels from the early historic period, as the arid environment necessitated water sustainability in the Vaigai basin even two millennia ago. This is achieved through understanding the geomorphology of sites and their correlations with climatic conditions, soil sediment analysis, and the spatial relationship of the sites to understand how deliberate selection of landscape was done based on the Vaigai river flow. In addition, contemporary texts of the Sangam age are used to comprehend phenomenology through the Tinai (Five-fold land) systems and the early historic people's perception of Vaigai and its associated landscapes. In turn, understanding the flow of life of past humans through the flow of the river.

Jens Jouaux, Michèle Dinies, Moritz Nykamp, Markus C. Blaich and Wiebke Bebermeier

Holocene fluvial geomorphodynamics and human-environment interactions at the Weser – linking fluvial and colluvial archives in the Rintelner Basin

Between the Late Glacial and the mid Holocene, Central European rivers and floodplains underwent significant transformations and experienced major reorganizations driven by climate change, shifts in discharge and sediment load and, the beginning of neolithic agriculture. In general, these developments and their interplay have received little attention in the north-western German low mountain range area and particularly in the Rintelner Basin: a valley widening along the middle Weser River course in western Lower Saxony, Germany.

We apply an integrative approach that couples geoelectrical prospection, sedimentological, geochemical, and palynological analyses with archaeological data to reconstruct the spatio-temporal development of fluvial paleo landforms and assess their relationships to the settlement history of the Rintelner Basin. Preliminary results indicate that the Weser River developed an anabranching channel pattern during the early Holocene, whose remnants are partly preserved under a thick layer of overbank fines. Analyzed archaeological sites and fluvial paleo landforms seem to show spatial-temporal relations and palynological analyses provide evidence for Neolithic cereal cultivation.

Nico Rogalski and Tobias Lauer

Chronostratigraphy of Pleistocene terraces of the middle Neckar using Luminescence dating

This study focuses on the dating of fluvial sediments from the middle Pleistocene in the middle Neckar region. Until now, these sediments had never been dated, making this the first attempt to do so using luminescence dating. Various fluvial terrace levels along the Neckar, between Ludwigsburg and Heilbronn, were sampled, including the well-known site of Frankenbach. Additionally, the two hominin fossil sites of Mauer and Steinheim were included, since the skull of Homo steinheimensis has never been dated before Previously, terrace ages had only be estimated relatively, based on cover sediments, and some fluvial deposits were correlated with others using evidence such as faunal remains. The obtained middle Pleistocene ages agree well with those previously suggested in older studies. Nevertheless, dating such old samples was very challenging as some samples appear to be saturated. Overall, this study shows that combining luminescence dating and borehole analysis provides a robust framework for understanding the formation of fluvial terraces during the Middle Pleistocene. It also offers important context for interpreting key human fossil sites within the broader landscape evolution.

Peter Fischer, Tina Georg, Felix Henselowsky, Benjamin Stoller, Matthias Pausch and Andreas Vött

Geoarchaeological investigations at the UNESCO World Heritage Site of the Roman Limes fort and vicus Ruffenhofen: Fluvial development of the river Wörnitz and its tributaries

The Roman Limes fort and vicus Ruffenhofen is located at the Raetian Limes in today's Middle Franconia (Bavaria). Intensive research is accompanied by the LIMESEUM as substantial part of the strategy for presentation and visualization of the World Heritage site. Beside non-invasive investigation of the fort and vicus using different geophysical methods, ongoing research also focuses on the Roman environment, which played an important role for supply, including the use of waterways. In this context, geoarchaeological investigations focus on the river Wörnitz and its tributaries. Our "off-site" studies include geoelectrical resistivity tomography, Direct Push Hydraulic Profiling and sediment coring to decipher the stratigraphic composition of the floodplain and to gain information on the overall fluvial development in the wider vicinity of the Roman fort. Our results show that at least three different terrace bodies developed in the floodplain that are partly overlain by silting-up sequences. Although dating results regarding the use of the Wörnitz by the Romans are still pending, the thickness and structure of the documented gravel bodies suggest phases with high flow dynamics, so that general navigability of the river Wörnitz can be assumed.

Bertil Maechtle, Torsten Mahren, Jochen Babist and Thomas Becker

Modification of the Modau meadows by medieval mining, mills and modern landuse

The Modau is a small tributary of the river Rhine, draining the northern part of the Odenwald mountains. Close to Ober-Ramstadt, silver ore mining took place at least since 1506 AD over a period of about 100 years with several breaks, but likely since medieval times. Adjacent to the mine, typical elements of smelting works - a crushing mill, a smelting furnance and channels for water and waterpower - have been installed. During a younger term of usage over the 18th century, an iron hammer mill was superimposed on the same plot called "Schmelzacker". Today, agriculture takes place on loessic colluvia, covering the archaeological remains, that are threatened by tillage. Using geomorphological mapping, geophysical prospection, sediment coring and historical sources, we started to reconstruct the multi-phased environmental history of this riverine environment geoarchaeologically, including the amount of pollution by mining and ore processing as well as shaping of the topography due to soil erosion, construction measures and water engineering in an area, that is representative for ancient mining activities in the ore-bearing uplands of the Odenwald.

Snjezana Pejdanovic, Zavra Ema, Birgit Schneider, Ella Quante, Marco Pohle, Sara Saeidi Ghavi Andam, Iris Nießen, Gerrit J. Schenk, Tobias Lauer, Kathryn E Fitzsimmons, Ukrike Werban, Yvonne Oelmann, Harald Neidhardt, Marcel Schön, Sven Marhan, Ellen Kandeler, Christian Poll, Peter Frenzel, Lukas Werther, Christoph Zielhofer and Petre Kühn

First steps towards the reconstruction of land use in the medieval Fluvial Anthroposhere of the Echaz floodplain (Southwest Germany)

This study presents the first steps towards a multidisciplinary reconstruction of the Fluvial Anthroposphere, by investigating local medieval pathways and land use in parts of the Echaz floodplain upstream of Pfullingen and downstream of Reutlingen.
These first steps of research comprise the digitisation of old maps combined with information from historical and archaeological archives. A digital relief model in combination with geophysical results from Electromagnetic Induction (EMI) and, Electrical Resistivity Tomography (ERT) are correlated with soil profiles and soil/sediment cores from the Echaz floodplain, and form the basis for the reconstruction of stratigraphies influenced by natural and anthropogenic processes.

This work will include the establishment of an initial chronostratigraphic model with luminescence ages of sediments and radiocarbon dates of charcoal fragments, which will provide the basis for the selection of suitable sites for further analysis, including a combination of digitized old maps and physical-biogeochemical analyses (enzymes for excrement input, polycyclic aromatic hydrocarbons [PAH] for fire use), stable isotope ratios of C and N for the differentiation of C3 and C4 plants, as well as XRF analysis (for heavy metal pollution) as well as mollusc and ostracod analyses for aquatic habitat and water quality reconstruction.

Adriana Sărășan, Adrian-Cristian Ardelean, Andrei Georgescu and Andrei Ioniță

Beyond field-walking: using an integrated approach for assessing the spatial configuration of the hillfort settlements in the Banat region

The Banat region of south-western Romania is home to a number of fortified hilltop settlements. Such settlements are indicative of hierarchical social structures, which were prevalent in most of Central Europe during the Late Hallstatt period. The Crivina-Leopoldsberg was recently discovered during filed-walking, and is one of the three hillfort settlements known in this region. The other two sites are the Herneacova-Cetate site and the Remetea Pogănici-Dealu Păscoani site that have been acknowledged for over half a century. Although these sites have been investigated through several archaeological excavations, the data concerning internal organization and landscape use is virtually unknown.
To address the knowledge gap concerning their spatial configuration, functional roles, and cultural connections, our research employs a multimethod approach integrating high-resolution surface mapping using uncrewed aerial vehicles (UAVs) equipped with a LiDAR sensor and subsurface geophysical techniques, such as magnetic prospection. Preliminary results demonstrate that the combined use of UAV LiDAR, and magnetic mapping provides significant potential for the study of Late Hallstatt hillfort settlements. The Crivina site exhibits distinct patterns of landscape use, reflecting adaptation to the local mountainous setting, whereas the other two sites display comparable strategies in landscape organization.

Elena Gazzoli

Mapping the invisible: facing the challenges in reconstructing the Roman landscape of the Reno valley (Bologna, Italy).

The Reno Valley, located west of Bologna, constitutes a natural communication route between the Po Plain and the Arno Basin, linking northern and central Italy. A landscape archaeology research project is currently enhancing our understanding of Roman settlement patterns within this area, with the aim of shedding further light on the Roman road network and the occupation of a territory with a complex history that covers a wide chronological timeframe. The ongoing investigation relies on a deep study of legacy data and the application of non-intrusive methods. The study has focused primarily on the organization of an extensive field-walking survey across a broad sample of the territory, applying the principles of site-less survey, to verify existing evidence and to collect new data. Preliminary outcomes seems to suggest a different picture from the one previously emerged from legacy data, which is mainly derived from archival and bibliographic sources. Rather, preliminary results suggest some different reconstruction hypothesis, which calls for a critical reassessment of the reliability of such data within highly anthropized contexts like this one. These findings also highlight the necessity of integrating more analytical tools to achieve a more comprehensive and accurate reconstruction of past landscape dynamics.

Lidia Żuk

Field-walking Survey in a Transforming Landscape. Reframing its Role in the Age of Remote Sensing (Lednica Landscape Park, Poland)

Since the 1980s, the Polish Archaeological Record (PAR) programme has established field-walking survey as a cornerstone of archaeological prospection across Poland. However, the profound transformations of rural landscapes over the past three decades—driven by socio-economic change in the 1990s and, especially, by EU-related development after 2004—have fundamentally altered the conditions under which such surveys can operate.
This paper critically reassesses the potential and limitations of surface survey in this changing context, drawing on research conducted in the Lednica Landscape Park, an area surrounding the island stronghold of Ostrów Lednicki, a key early medieval centre of the emerging Polish state. The study revealed how processes such as housing expansion, intensification of tourism, changing cultivation regimes, and evolving forestry practices have constrained the field conditions suitable for survey and, consequently, the accessibility of archaeological data.
By integrating remote sensing datasets—from aerial and satellite imagery (including Earth Observation data) to Airborne Laser Scanning and spatial planning documents—we explore how these tools can inform the design, targeting, and interpretation of surface survey. The Lednica case illustrates how remote sensing enables a critical reframing of field-walking: not as a redundant method, but as a strategically informed and context-sensitive practice.

Caterina Bertolano, Giacomo Moro, Carmen Di Fulvio and Jacopo Turchetto

From above to the ground: integrating field survey and remote sensing at san basilio (ariano nel polesine, rovigo)

Between 2022 and 2024, research conducted by the Ancient Topography team of the University of Padua at the site of San Basilio (Ariano Polesine, Rovigo) aimed to update the archaeological framework of the Tenuta Forzello area. These campaigns were carried out using remote sensing techniques, particularly aerial photographs, satellite imagery, and drone data. The approach adopted for the surveys involved the integration of on-site data acquisition, management, visualization, and spatial analysis using open-source GIS software such as QField and QGIS. Through a density-based recording methodology, the spatial distribution of surface finds revealed clusters indicating the presence of a Roman vicus whose extent proved to be much larger than previously hypothesized. This settlement developed along the route of the Via Annia-Popillia, which has also been archaeologically verified on the ground. This case study highlights the importance of integrating remote sensing observations with direct ground verification. The dialogue between aerial imagery and field survey not only refines the understanding of surface traces, but also allows the identification and dating of anomalies that are not detectable from remote data alone. In doing so, it reaffirms the continuing relevance of field-walking survey within the evolving methodological framework of landscape archaeology.

Vanessa Antunes and Telmo Pereira

Between Soil and Satellite: Rethinking Field Survey in the Age of Remote Sensing.

Field survey, long regarded as a cornerstone for identifying and characterising archaeological sites, now faces both challenges and opportunities brought about by rapid technological and environmental change. The growing opacity of the landscapes, resulting from intensive agricultural practices, urban expansion, and climate-related transformations, has significantly reduced archaeological visibility, calling for a critical reassessment of traditional prospection methods. This paper reflects on the future of field survey in light of the integration of remote sensing techniques such as LiDAR, multispectral, thermal and satellite imagery, which are increasingly applied in Portugal. It argues that, far from replacing direct observation, these technologies can reshape the archaeologist's relationship with the landscape, fostering a hybrid approach that combines technological precision with contextual and interpretive insight. Drawing on the analysis of Environmental Impact Assessment studies and the practical application of remote sensing methodologies, the paper discusses how these tools can enhance the early detection of archaeological remains, mitigate heritage impacts, and promote a more sustainable archaeology. Ultimately, it proposes to reconsider field survey not as an obsolete practice, but as an evolving component of a new, interdisciplinary paradigm in landscape archaeology.

Giovanna Pizziolo, Giorgia Aprile, Chiara De Marco, Arianna Ferrero, Domenico Lo Vetro, Gaia Mustone, Carlo Tessaro and Ida Tiberi

Connecting sites:
Field survey activities in the Parco delle Veneri (Parabita, Lecce district)- Pathways to explore Prehistoric Landscapes in the Serre Salentine framework.

The ongoing investigation activities at the archaeological park related to Grotta delle Veneri in Parabita (Lecce district, Puglia) emphasize the important role of landscape archaeology and the field survey approach to provide contextual data. The prehistoric cave of Grotta delle Veneri, shows an exceptional stratigraphic sequence attesting domestic, funerary and cult practices from Middle Palaeolithic to Bronze age. The cave is today the key site of a musealisation process which is giving place to the Parco delle Veneri Archaeological Park. The project, still in progress aims to connect the Cave with other single archaeological features discovered in the territory of Parabita throughout a diffused museum systems structured with pathways. In this process a new field survey project aims to provide further archaeological information in order to connect those isolated sites. The project requires a combination of traditional and innovative methods to explore and reconstruct the archaeological landscape. The complexity of the modern landscape introduces biases and conceals palaeoenvironmental traces; for this reason, direct field survey remains indispensable for the identification of further archaeological evidence. Originating from open air museum and heritage enhancement needs, the project promotes a balanced interdisciplinary approach capable of enhancing archaeological legibility aiming to landscape reconstruction.

Francesca Bindelli

Rethinking surface survey in an 'ideal' landscape: the roman town and territory of Suasa (Italy)

Field-walking surveys have long been a fundamental tool in landscape archaeology. However, today, they face new challenges, including changes in agricultural practices, alterations in vegetation cover, and ongoing soil consumption, all of which reduce archaeological legibility. This contribution reflects on the current and future role of surface surveys, using the Roman town of Suasa (Castelleone di Suasa, Italy) and its surrounding territory as a case study. Founded in the middle valley of the Cesano Valley in the first half of the 3rd century BC, Suasa occupies an area that was already inhabited in protohistoric times. The landscape has been continuously shaped by depositional processes of the Cesano River, which have gradually modified the ancient terrain. Despite these transformations, the landscape retains a high degree of archaeological legibility, with urban, peri-urban, and rural zones coexisting in close topographical proximity, in an area that has never been affected by continuous modern settlement. This research aims to gather data to enhance our understanding of the town and its territory, and to critically assess the method itself. Suasa is used to evaluate the potential of digital technologies and remote sensing in a context that remains particularly suited for field-walking surveys.

Anna Garstka

Neighbors or enemies?
Selected Latvian hillforts in the light of GIS analysis

There are approximately 482 hillforts in the territory of present-day Latvia. A significant number of them were discovered over the past two centuries through field research. However, the identification of new hillforts now largely relies on the availability of lidar data and point clouds obtained through aerial scanning. In the area of the modern municipality of Svente, four hillforts are located within an area of about 30 km²: Kaķiši, Arāji, Āpšukalns and Sudmali. These sites date from the pre-Roman Iron Age to the Early/Middle Iron Age (500 BC- 400/800 AD). However, they are poorly studied, and there is limited information on their functions or associated sites (such as settlements and cemeteries). Using GIS analytical methods, it is possible to study various aspects, including the potential range of influence of the sites, the natural and socioeconomic conditions of the locations of the hillforts. Questions arise, such as: Were these sites cooperating with each other, or were they competing units? Can any of the sites be considered a central place – seat of power? To attempt to answer these questions, NMT was used to create several morphometric parameters, such as slope direction, visibility analysis, and accessibility analysis.

09:00-10:40 Session 25A:
Forests as Archives: Interdisciplinary approaches to explore the woodland geoarchaeological record

CHAIRS: *Anna Schneider*
LOCATION: U5 / 01.17

09:00 *Anna Swieder*
Cultural landscape caught between heritage preservation and forest conversion: The Harz Mountains as archaeological archive

The largely forested eastern Harz Mountains contain a remarkable variety and density of archaeological remains, reflecting the region's geological diversity and long settlement history. Preserved sites range from prehistoric earthworks and medieval fortifications to abandoned villages, mining relics, water management systems, charcoal kilns, glassworks, or historical paths. Their GIS-based documentation combines spatial data from LiDAR-derived digital terrain models with historical maps, aerial imagery, written sources, archaeological finds, excavation reports, and field surveys. Over 43,000 single features have been recorded, constituting a complex, multi-layered cultural landscape shaped by human interaction with the natural environment through settlement activity, resource extraction, or the construction of transport routes. In particular, large-scale ore mining, associated with extensive water management systems and intensive charcoal-based smelting industries, was of particular transformative significance, as it profoundly altered the region's topography and ecology. Nevertheless, today this archaeological heritage is under serious threat. Intensive forestry, predominantly driven by economic interests, persists in changing the terrain, frequently resulting in the destruction of archaeological remains. Furthermore, recurrent droughts, bark beetle calamities, and other environmental stresses have further accelerated the degradation of the cultural landscape.

09:20 *Jerzy Sikora*
The borderland covered by forest. A medieval borderland between (Greater) Poland and Pomerania in remote sensing survey.

In the Middle Ages, at least since the second half of the 10th century, the northern Polish territory north of the river Noteć, between the rivers Brda to the east and Gwda to the west, was considered part of Pomerania. From the second half of the 10th century, it bordered the growing Piast state. The expanding Polish monarchy saw these lands as a natural area for expansion. Much of this territory is now covered by forests. Some of these were planted in the 18th and 19th centuries to replace harvested ancient, primeval Noteć Forest. Paradoxically, the planting of these forests has preserved large areas of early medieval landscapes containing hill forts, burial mounds, cemeteries, field systems, roads, enclosures and other features, protecting them from destruction by 20th and 21st century agriculture. This paper focuses on remote sensing techniques, particularly the analysis of LiDAR-derived terrain models, visualisations and aerial pictures, to uncover past landscapes, especially those from the early medieval period. As few archaeological studies are currently being conducted in this area, images obtained through the analysis of remote sensing data will be compared with archival research information from the early 20th century and the 1960s.

09:40 *Pille Tomson, Pikne Kama and Tambet Kikas*
Relict Charcoal Kilns in South-Eastern Estonia: LiDAR Analysis and Field Verification

Relict charcoal-burning sites have received little attention in Estonia. In recent years, however, previously unknown kiln mounds have been identified in south-eastern Estonia using publicly available LiDAR-based relief maps. During fieldwork in 2023, 58 charcoal kiln mounds and 88 pits were recorded in the Karula study area. The mound kilns were radiocarbon dated mainly to the 15th century, while the pit kilns represent two production phases: medieval and late modern. In 1978–1979, two mound kilns near Piusa in south-eastern Estonia were mistakenly excavated as presumed barrows and were later dated to the 17th–18th centuries. LiDAR data show that more similar landforms exist in this area, and fieldwork in 2025 confirmed four additional charcoal-burning sites, two of which are still legally protected as barrow groups. The first inventory in Karula showed that many kiln mounds and pits are not detectable in the public LiDAR map. To address this, we generated a shaded relief model by combining ground points from four airborne laser scanning campaigns (2011–2023) and produced a detailed digital terrain model with 0.4 m pixel resolution. This model enabled the discovery of additional kiln mounds of different sizes and periods.

10:00 *Janne Ikäheimo*
Underneath the Coniferous Canopy: AI-Assisted LiDAR Analysis of Cultural Heritage in Forests of Northern Finland

Omnipresent forested landscapes in Northern Finland preserve a rich and layered archaeological record, ranging from prehistoric dwelling sites and wild reindeer pitfalls to pre-modern tar and charcoal kilns. More recently, remnants of 20th-century forestry such as logging camps, as well as traces of World War II, have added further complexity to this cultural archive. This paper presents an interdisciplinary approach combining airborne laser scanning, artificial intelligence, and field verification to detect and interpret these features. High-resolution LiDAR data enables precise localization and delineation of surface-visible features—far surpassing the capabilities of conventional GNSS-based approaches in dense forest environments. AI-assisted analysis has proven effective in identifying subtle microrelief patterns, which are then verified in the field within the framework of heritage management. The presentation highlights the benefits of remote sensing and machine learning in uncovering diverse cultural layers in forested environments. By enabling accurate documentation of features across multiple historical periods and land-use regimes, this approach strengthens the knowledge base for land-use planning, supports the integration of archaeological data into forestry and infrastructure development, and helps mitigate the impact of modern forest operations. Ultimately, it contributes to the long-term preservation, recognition, and responsible management of forest landscapes as cultural archives.

09:00-10:40 Session 17A: Living Landscapes: Transdisciplinary Approaches to Heritage and Environment in Pompeii, the Amalfi Coast and Beyond

CHAIRS: *Dennis Mitschke and Ralf Kilian*
LOCATION: U5 / 01.17

09:00 *Dennis Mitschke*
Introduction

Martin Michette, Katrin Wilhelm and Ralf Kilian
Keynote: Living Landscapes: Transdisciplinary Approaches to Heritage and Environment in Pompeii, the Amalfi Coast and beyond

09:20 *Maria Elena Ronza and Ayah Twaisi*
From Petra to Pompeii: Community-Based Conservation and Living Landscapes

Sela for Training and Protection of Heritage is a Jordan-based NGO pioneering community-driven approaches to heritage conservation and sustainable development. Founded in Petra in 2015, Sela has developed a model that links conservation practice, vocational training, and local economic participation. Its programs include children's activities, internships, and workshops that strengthen community ownership of cultural resources. This presentation traces Sela's growth from local initiatives in Petra to international collaborations, including exchanges with community-based organizations in Italy. Through examples from heritage projects across Jordan, it demonstrates how participatory conservation fosters economic resilience, and addresses environmental and heritage-related challenges. A key focus is the increasing participation of women in fieldwork and leadership roles, which has diversified heritage narratives and promoted inclusive social change. Since 2020, long-term efforts to establish workshops in Petra within the framework of the Academy of Conservation and Care for the Environment (ACCE) have marked a new phase of cross-Mediterranean dialogue on living landscapes. In 2024, twelve Sela trainees attended the ACCE opening conference in Pompeii, followed by exchanges on innovative community engagement models along the Amalfi Coast. Together, these initiatives show how heritage, grounded in local participation, can become a powerful driver of both conservation and sustainable livelihoods.

09:00-10:40 Session 31A:
What is the future of surface survey? Rethinking new and old methods for landscape archaeology

CHAIRS: *Enrico Giorgi, Giacomo Sigismondo, Veronica Castignani, Francesca D'Ambola*
LOCATION: U5 / 01.22

09:00 *Enrico Giorgi*
Introduction

09:20 *Martijn van Leusen*
The role of fieldwalking surveys in the archaeologists' noninvasive toolbox

Field walking is one of the tools available to the archaeologist for the investigation of archaeological landscapes; its use complements, and to some degree overlaps with, that of other noninvasive methods. Whilst rumors of its death are exaggerated, fieldwalking has suffered in recent decades from increasing obstructions, resulting from the progressive abandonment of agricultural landscapes and regrowth of vegetation, the progressive destruction of the record in areas of continued agricultural exploitation, and worsening administrative restrictions imposed by national heritage agencies. In this paper I argue firstly, that fieldwalking still contributes essential knowledge about the (evolution of the) archaeological landscape that cannot result from other noninvasive methods, and secondly that it no longer makes sense to view fieldwalking as a separate, independent method for investigating that landscape. Instead, multiple non-invasive methods detect different but often overlapping attributes of the same sub-soil, physical reality: archaeological features and layers modified by landscape taphonomic processes. Accordingly, I propose a Marie Curie Doctoral Network to train a new generation of landscape archaeologists in the integral, noninvasive study of the archaeological record and its physical geographical context.

09:40 *Jaime Sastre Jiménez, Míriam Quiles Morales, Isabel Fernández Urbina, Manuel Castro-Priego, Mario Gutiérrez Rodríguez, Pilar Diarte-Blasco and Marta Pérez-Polo*
Re-evaluating Landscape Survey: Reflections on Needs and Challenges in the Digital Humanities Era

In recent decades, landscape archaeology has undergone a profound transformation driven by the rise of non-invasive technologies and digital humanities. This methodological shift has renewed approaches to the territory, expanding the possibilities for analysis and documentation of the archaeological record. However, this process has sparked an epistemological debate about the balance between technological innovation and traditional prospecting and analysis practices.

This paper proposes a methodological reflection on the application of different survey strategies in diverse landscape and archaeological contexts in inland Spain (with examples from the Ebro, Tagus and Guadalquivir valleys), with the aim of assessing their suitability for each environment and discussing their respective strengths and limitations. Through a critical and comparative review, it examines how the incorporation of digital tools—such as geographic information systems, remote sensing, and artificial intelligence—can be integrated with conventional methods to generate more complete and sustainable interpretations of the cultural landscapes. This contribution seeks to provide elements for a renewed dialogue between tradition and innovation in the contemporary practice of landscape archaeology.

10:00 *Ermengol Gassiot Ballbè, Sara Díaz Bonilla, Rubén de la Fuente Seoane, María Dolores Guerrero Perales, Sergi Mata Ferrer and Guillem Salvador Baiges*
Old challenges, new techniques: potential and limitations of new methods in surface surveys in high mountain areas

The increasing popularity of new remote sensing techniques in archaeology, together with new tools for acquiring data in the field (GNSS, portable LIDAR, etc.), is leading to significant changes in the organisation of surface survey methodology. These changes affect the various phases of the work, from terrain analysis and remote detection actions prior to fieldwork to recording actions during field-walking surveys. This presentation outlines the changes introduced in recent years in surface surveys of high mountain areas in the Pyrenees, between 1000 and 3000 m above sea level. These innovations relate to: 1) analysis prior to field-walking using modelling and remote sensing techniques, 2) the collection of information in the field, which is still essential given the limited visibility of certain elements and the need to verify the information from the previous point, and 3) its subsequent transfer to spatial database systems. Here, GIS and LIDAR systems on portable devices, together with the use of drones, are revolutionizing the possibilities for field documentation. The increase in recent years in the documentary potential of this type of non-invasive archaeology is undeniable. However, its scope still has some limitations that can only be resolved through archaeological excavations.

10:20 *Caroline Posch, Roman Lamprecht and Julia Haas*
Reading the Mountains. Methods and Approaches to the Prospection of Alpine Landscapes in the Southern Alps of Austria

Alpine landscapes represent one of the most challenging environments on the planet. Yet they have been frequented and utilised by humans since the Pleistocene - as resource scapes for foraging and raw material extraction, as pastures, as zones of mobility and exchange, and as arenas for ritual and symbolic practices. The material traces of such activities range from substantial modifications of the landscape to highly ephemeral remains, rendering archaeological prospection in these areas particularly complex and methodologically challenging. This paper presents and evaluates a multilayered approach to archaeological prospection conducted in the Upper Gailtal Valley, Southern Austria. Here it was the goal to discover and map prehistoric sites in an area, which was mainly known as a frontline of WWI. Prior to fieldwork, potential zones of interest were defined through GIS-based analyses of geomorphological, topographic, and hydrological data, complemented by the study of historical maps, aerial imagery, and remote sensing using LIDAR data. Fieldwork relied on systematic yet flexible free terrain surveying, together with intuitive test pitting. The resulting dataset underscores the effectiveness of integrating diverse analytical and field-based methods, demonstrating the potential and strength of adaptive survey strategies for identifying and interpreting human activity within alpine landscapes.

10:40-11:10 **Coffee Break**

11:10-12:30 Session 18A:
Tracing back historical land-use and its legacies: common insights and perspectives of landscape archaeology and historical landscape ecology

CHAIRS: *Sjoerd Kluiving, Rebekka Dossche, Nik Petek-Sargeant, Valentina Pescini, Anneli Ekblom, Paul Lane, Giovanna Pezzi, Bennie Shen, Marianna Biró, Matthew Davies*
LOCATION: KR12 / 02.18

Marie-Claude Bal, Carine Calastrenc, Damien Ertlen, Sandra Kapetanovic, Milos Petricevic, Christine Rendu and Gilles Rixhon
Sinjajevina (Montenegro), a fabulous mountain fieldwork to combine landscape archaeology and landscape ecology

In July 2025, the SINJA-SUPPORT project undertook an exploratory fieldwork mission to Sinjajevina (Montenegro), one of the largest agro-pastoral plateaus in the Balkans. The interdisciplinary team, composed of landscape archaeologists and landscape ecologists specializing in mountain socio-ecosystems, aims to understand the diachronic and spatial co-evolution between societies and their environment during the Holocene. This combined approach has already uncovered a multitude of archaeological sites known as ‚katuns' using non-invasive methods like drone exploration. Furthermore, the project has revealed phases of fire activity during the Bronze Age and the Roman Empire. These fire phases are known in other Euro-Mediterranean mountains to be associated with pastoral or agricultural land use, in addition to fires caused by lightning. The project coordinator also contributes to the structuring of mountain research by coordinating international projects and as director of the CIMES (International Centre for Southern Mountains) scientific interest group, which brings together specialists in mountain socio-ecosystems across the Euro-Mediterranean basin. This session would be a unique opportunity to engage in discussions with other networks that support this type of research, such as IALA, IALE, and IHOPE."

Matthias Bürgi and Susan Lock
"This is what Swiss mountain forests used to look like" – why one persisted and how this claim can be substantiated

Alpine forests have been part of a pastoral landscape in many regions for centuries. In the nineteenth century, a professional forestry service developed, and the local needs for pasture land were supplemented by non-local actors with their interest in timber and other ecosystem services, resulting in widespread changes in forest use and structure. In the Alpine valley of Avers, in Switzerland, the development of the different demands of the stakeholders and their effects on forest development were analysed using an interdisciplinary multi-source approach. Aerial photography, repeat terrestrial photography, written historical sources and oral history interviews allow to trace the development in forest use and forest structure. One of the stands depicts a remarkable degree of persistency and is partly to this day used as pastureland and still shows a very open, park-like structure, whereas the surrounding stands depict a high degree of ingrowth and densification. We propose that this site be regarded as a relic of conditions that were once widespread and that it be accorded a correspondingly high value as a witness to an earlier cultural landscape.

Chiara Molinari, Bruna Ilde Menozzi, Andrés Menéndez-Blanco, Riccardo Santeramo and Anna Maria Stagno
One millennium of environmental resources management in NW Iberian mountains: insights from multi-proxy analysis

A multi-proxy study carried out in the SW Asturias mountains (NW Iberian Peninsula) provides information about different phases of landscape dynamics since ca. 1000 AD, strictly associated with environmental resources past management practices. Analyses included biostratigraphical data from a sedimentary record collected in the Freisnéu valley and anthracological information from two charcoal kilns and two pastoral huts located in the nearby area of Monte de La Reigada, supported by archaeological and historical evidence. The results allowed to explore main effects of different drivers on land-cover variations, revealing the primary role of past agropastoral activities as control factors for changing vegetation structure and composition during the last millennium. Even if the investigated landscape was generally characterised by quite open conditions during the time period recorded, the reduction of wooded-meadows registered since c. 1300 AD seems more related to an intensification of meadows, pastures and cultivations than to woodland management for charcoal production. Additionally, our study underlines the linkage between the abandonment of multifunctional systems in the Asturian mountain region and the growth of natural woodland and heathland formations starting since the beginning of the 20th century. A dynamic management is necessary for the restoration and sustainable maintenance of mountain ecosystems biodiversity.

Louise Smith, Jeffry Oliver, Gill Plunkett, Kate Britton and J. Edward Schofield
Exploring the landscape legacies of post-medieval crofting in the uplands of Northeast Scotland using mixed methods from archaeology and ecology

The Improvement Period in Scotland started in the 18th and 19th centuries and entailed a shift from mainly subsistence farming to larger scale market-based agricultural operations. Many small tenant farmers were displaced and encouraged to move into the uplands, create crofts and transform these marginal areas for traditional agricultural use. This introduced to a new type of human landscape with heaths and moorlands transformed into arable fields, kitchen gardens and pastures, significantly altering abiotic and biotic conditions. However, economic hardship led to many crofts being abandoned or their land use changing to low intensity pastures and forestry. This project aims to bridge the gap between archaeology and ecology applying methods from both disciplines to explore how a historic shift in farming practices has left a legacy in the marginal areas of Scotland. Ortho imaging has been used to map crofting colonies and compare these to the historic OS maps. Vegetation surveys identified plant features which have lasted since crofting occupation and trees were dendrochronologically dated to proof they were originally introduced by crofters. The study has examined sites across the Northeast of Scotland showing that these landscape legacies are largescale trends not simply tied to small areas.

11:10-12:30 Session 10B:
Modelling demography through archaeological data: from theoretical approaches to global case studies

CHAIRS: *Michele Abballe, Francesca Chelazzi, Alessio Palmisano, Dan Lawrence*
LOCATION: U5 / 02.17

11:10 *Samuel Nión-Álvarez*
What can we learn about social dynamics from paleodemography? A microspatial approach from NW Iberian Iron Age

Demographic studies in archaeology have not been particularly prolific in recent decades. However, advances in statistical sampling, the integration of radiocarbon data and the application of new quantitative formulas have represented a significant turning point in this field.

In this paper, we will analyse the social transformations of an Iron Age settlement in north-west Spain using paleodemography, chrono-statistics, and the archaeology of households. Focusing on the Punta de Muros case study, we will examine the significant changes that a small Early Iron Age settlement underwent at particular points in its history. Thanks to an extensive dataset, we will be able to determine when these changes occurred and the impact they had on daily and social life.

This conference will present a methodological approach and a joint assessment of the combined disciplines, as well as a long-term interpretation of the social dynamics. Finally, we will examine the potential for using these techniques to analyse the social dynamics of the Iron Age on a larger scale.

11:30 *Ralph Großmann-Klabunde*
Paleodemographic population estimates for the Cucuteni-Trypillia societies

The size and density of prehistoric populations are considered to be important indicators of population conditions. Although there are many relative results on population dynamics, absolute population sizes are still underrepresented in research. This project aims to conduct a diachronic multi-proxy estimation of absolute population size, combining two approaches: the geostatic (Cologne Protocol) method and the Bayesian method. These two approaches will then be combined. The analyses will be carried out in selected European regions. First estimates of palaeodemographic developments for the Cucuteni-Trypillia societies, located between the Carpathians in the west and the Dnieper in the east, are presented. These Chalcolithic societies emerged around 4800 BC and are characterised by systematically planned villages, a distinct agricultural economy, the use of copper, and an elaborate material culture. Notably, mega-sites with a base area of over 100 hectares were established around 3950 BC.

11:50 *Filippo Rizzitano*
Testing demographic models at a small scale: a Bayesian and multiproxy approach from central-southern Italy

Demographic models based on radiocarbon dates are typically applied to large-scale case studies with extensive chronological spans. This study, instead, applies advanced statistical approaches at a smaller regional scale to explore how radiocarbon data can be used to reconstruct population dynamics. The method integrates radiocarbon datasets with archaeological site-based proxies, including analyses such as site counts and aoristic weights, to test quantitative models in regions with limited radiocarbon coverage. A Bayesian modelling approach was first applied to the available radiocarbon dates, grouped by cultural association, in order to refine the chronological sequence of the study area. On this basis, undated archaeological sites, including those identified through survey, were assigned to specific chronological blocks by cross-dating ceramic assemblages consistent with those aspects. The case study focuses on central-southern Italy during the Eneolithic and Bronze Age, a period of marked cultural variability but also one in which available 14C evidence remains scarce. This context provides an ideal framework for a comparative analysis of multiple proxies to evaluate the reliability and limits of radiocarbon-based demographic models in small-scale contexts. The adopted R-based workflow ensures transparency, reproducibility, and flexibility across different contexts.

12:10 *Vicky Manolopoulou and Michele Abballe*
Discussion

11:10-12:30 Session 14B:
Re-discovering Mountainscapes:
An Interdisciplinary Approach to Mountainous Areas

CHAIRS: *José Abellán Santisteban and Ylenia Paciotti*
LOCATION: U5 / 01.18

11:10 *Hadi Ibrahim and Hadi Alrasses*
Rock-Cut and Hypogeum Funerary Landscapes of the Safita Highlands (Syria): New Field Evidence from 2024–2025

Recent fieldwork conducted between 2024 and 2025 in the mountainous hinterland of Safita and adjacent areas of the Tartus region (coastal Syria) has revealed a previously undocumented group of rock-cut and hypogeum tombs. These funerary monuments, carved into steep slopes and rocky escarpments overlooking river valleys and ancient routes, represent the first systematic evidence of Classical-period (Hellenistic to Late Antique) funerary use of this part of western Syria.

The research integrates descriptive recording, architectural documentation, GIS-based spatial mapping, and 3D modeling to investigate how these tombs were situated within the mountain environment. The tombs display notable architectural variability, ranging from simple chamber graves to more elaborate forms with multiple loculi, reflecting local adaptations to topography, geology, and visual context. Their distribution suggests deliberate spatial relationships between burial sites, hydrological systems, and ancient communication routes.

By approaching these rock-cut features through a landscape-archaeological perspective, the study highlights the dynamic interaction between human communities and mountain terrain as both a physical and symbolic space. This contribution provides new empirical and methodological data for understanding mountain landscapes as arenas of cultural expression, spatial organization, and environmental negotiation.

11:30 *Raed Halak*
Fortified Landscapes and Their Suburbs in Medieval Syria: Interactions between Military Strongholds and Civil Settlements

This paper highlights the dynamic relationship between elevated fortifications in medieval Syria and their nearby suburbs, viewed as a distinctive model of interaction between military and civilian spheres within the broader landscape. The fortifications of Saladin, Al-Marqab, and Krak des Chevaliers exemplify this pattern, having been constructed on strategic heights that ensured surveillance and control. Around them developed small suburban settlements that supported the fortresses through agricultural, commercial, and artisanal activities essential for their maintenance and survival. The study aims to examine how these suburbs functioned as logistical and economic extensions of the fortresses during peacetime and as defensive buffers during wartime, reflecting a system of mutual dependence between fortress and settlement. Methodologically, the research applies Geospatial Analysis (GIS) and topographical comparison, using open-access spatial data, digital maps, and aerial imagery to reconstruct and analyze the physical and functional connections between the fortress, the suburb, and the natural terrain. Ultimately, the study offers a new interpretation of Syrian medieval fortifications as administrative and military hubs surrounded by civilian support networks, forming an integrated "system of survival" that illustrates the balance between defense, settlement, and environment in the mountainous landscapes of medieval Syria.

11:50 *Sarla Bhirud*
Mountains of Memory: The Satmala–Patne–Pitalkhora Landscape of Knowledge and Civilization in the Deccan Plateau (pre-recorded video)

The Satmala–Patne–Pitalkhora landscape of northern Maharashtra, part of the vast Deccan Trap volcanic province, illustrates human civilization. Formed by Late Cretaceous flood basalt eruptions (~66–68 Ma), the Satmala Range's with its escarpments, valleys, shaped early settlements. Archaeological findings from the Patne Valley reveal continuous occupation from the Upper Paleolithic to the Early Historic period, demonstrate human adaptation to basaltic and fluvial environments. Within this same volcanic setting, the Pitalkhora Caves— one of India's earliest Buddhist rock-cut monuments (2nd century BCE), strategically located trade route.

During the medieval period, the region flourished with temples and forts like Jain cave, Hindu cave marking its strategic and devotional prominence. The Changdev matha, linked to Bhaskaracharya's mathematical legacy, highlights its role as an intellectual and spiritual nucleus.

12:10 *Rajan Koyu*
Diverse dolmen landscapes across the globe A case study of dolmen sites in mountainous tracts in Palakkad Gap of India

This paper is based on archaeological surveys of dolmen sites in hilly and mountainous regions in the Palakkad Gap region of India. The study was inspired by the gigantic form and aesthetic beauty of dolmens when seen in specific topographic conditions. Unlike cist burials, dolmens appear to be distinct because of their capstones. As in other parts, dolmens in south India, including Kerala, bear similar features despite the difference in their chronology. The author's surveys reveal some features distinct from those of Europe, the cradle of dolmens. Dolmens had appeared in the Indian subcontinent as early as 2000 BC. Their chronological span ranges upto the mid-first millennium BC in the case of the far south of India. Despite their apparent similarities in form and purpose, dolmens which were created in the fifth millennium BC, occur on mountainous tracts in India, including the study region. This opens up avenues for investigations into diverse landscapes of dolmen sites across the globe and aspects including patterns in the spread of dolmen-building in the study region. Most dolmen sites, including those in Balkan lands, are in mountainous regions. The post-glacial European monuments such as dolmens could be found in river valleys as well.

11:10-12:30 Session 15B:
Terraced landscapes as longterm socio-ecological archives

CHAIRS: *Ralf Vandam, Soetkin Vervust, Axel Cerón González, Antony Brown*
LOCATION: U2 / 01.33

11:10 *Tibor Novák, Przemysław Charzyński, Marcin Świtoniak, Blaz Repe, Szabolcs Czigány and Martin Saksa*
Vineyard terraces as soil archives: disturbance or preservation? Case studies from Central Europe wine districts

Terrace construction with the establishment of dry-stone retaining walls to reduce soil loss by water erosion, stabilize slopes, and support cultivation is a very old practice in vineyard management. Techniques of wall building and slope reshaping have varied across time and regions, but they also show remarkable diversity even within the same wine districts at a given period. The construction of walls over the original surface can preserve intact, undisturbed soil profiles and their pedogenic features, serving as natural archives from the time of terrace establishment. However, it may also cause significant disturbance on terrace platforms during the preparation of cuts and fillings, as well as while collecting and separating rocks for surface remodeling, which often alters natural soil profiles.In our presentation, terraced soils from various Central European wine districts are evaluated based on how effectively they preserve pedogenic features formed before terrace establishment, and on the extent to which they can be regarded as cultural and landscape history archives that both preserve and reveal the history of terrace construction. Such soils represent valuable stratigraphic and geoarchaeological records, offering unique insights into the interaction between human activity, land use, and soil development in viticultural landscapes.

11:30 *Katja Kothieringer, Astrid Röpke, Angelika Abderhalden-Raba, Philippe Della Casa, Karsten Lambers, Bertil Mächtle and Mario Ranzinger*
Microarchaeological perspectives on the longterm development of the terraced landscape of Ramosch (Switzerland)

The pronounced terraced landscape of Ramosch (1100-1700 m a.s.l.) in the Lower Engadine, Eastern Central Alps, represents a key area for studying longterm human-environment interactions in alpine settings. Human presence below the tree line can be traced back to the Mesolithic period, and there is clear evidence of continuous land use since the Late Neolithic. During the Bronze and Iron Ages, we see intensified shaping of the landscape, marked by the construction of terraces that correspond to settlement phases of the Ramosch-Mottata archaeological site. A multidisciplinary framework integrating archaeological, geophysical, archaeobotanical, and geoarchaeological methods was applied to investigate a range of prehistoric features, including agricultural terraces, irrigation channels, and settlement areas. The results reveal notable variability in terrace morphology and function. With an identified piled-up stonewall, the oldest terrace site Chantata (1636 m a.s.l.) dates back to the Bronze Age. Pedological and micromorphological analyses help to elucidate the complex history of agricultural practices from the Bronze Age to the Middle Ages. Thus, we could decipher former insitu surfaces exhibiting unambiguous indicators of tillage. Complementary micro-archaeobotanical analyses of thin sections -encompassing pollen, spores, non-pollen palynomorphs, and phytoliths- provide additional evidence of land-use intensity across millennia.

11:50 *Sabina Ghislandi, Marialucia Amadio, Luca Bombardieri, Ralf Vandam, Soetkin Vervust, Ella Egberts, Axel Cerón González, Mónica Eguiluz, Yannick Devos and Ivano Rellini*
Landscapes of Resilience: The Terraced Hills of Erimi, Cyprus

Terraces in Cyprus have long represented a key component of both past and present agricultural systems. The island's topography and climate have favoured the development of terracing to manage water, control erosion, and expand cultivable land and their role became increasingly significant with the intensification of agriculture from the Bronze Age onwards. The Middle Bronze Age settlement of Erimi-LtP (S. Cyprus) provides a compelling case study. Located in an area with limited fertile land and reduced agricultural potential, the site is surrounded by a terraced landscape whose structures display distinct morphological and constructional characteristics. This contribution presents the results of geoarchaeological investigations carried out within the framework of the EARTHERITAGE Project, in collaboration with the Vrije Universiteit Brussel. The terrace systems were examined through macroscopic and structural analyses, supported by pedological investigations, soil micromorphology, phytolith studies, and OSL dating. The paper highlights the different phases of terrace construction in the landscape surrounding Erimi and their use through time.

12:10 *Axel Cerón González, Matteo Rossi, Ella Egberts, Mónica Alonso Eguiluz, Soetkin Vervust, Ralf Vandam, Emeri Farinetti and Yannick Devos*
The terraces of Montefalco in Italy: A geoarchaeological approach

The Castle of Montefalco (11th to 14th century A.D.) in central Italy is situated within a karst environment, surrounded by a system of walled terraces that date back to the Modern period, and possibly earlier. The construction of terraces reflects human efforts in creating flat land in mountainous regions for farming or agroforestry. An interdisciplinary geoarchaeological approach has been developed with applicability across various scales, from microscopic to landscape level. Field observations indicate that the terrace walls were built in contact with the limestone bedrock and follow specific surface karst features and relict soils. The geoarchaeological reconstruction of terrace fillings and maintenance suggests the addition of reworked soils and rock fragments, either cherts or limestones. The terrace soils remain biologically active and are continuously bioturbated, as observed at the microscale. The luminescence stratigraphy shows normal net OSL signal-depth progression, suggesting natural, gradual sedimentation behind the terrace walls.

11:10-12:30 Session 21B:
Forests as Archives: Interdisciplinary approaches to explore the woodland geoarchaeological record

CHAIRS: *Anna Schneider*
LOCATION: U5 / 02.22

11:10 *Jiří Woitsch, Václav Matoušek and Tomáš Kroupa*
Charcoal making research revisited: Using anthropological approaches to understand the final episodes of charcoal production in the Central Europe

public), continuous iron ore processing has been documented since the 14th century. Until the 18th century, this was one of the most important iron-producing regions in the entire Habsburg Monarchy. As a result, production of charcoal in earth mound kilns developed exceptionally. The number of preserved kiln platforms runs into the thousands, and charcoal production had an extreme impact on the landscapes and environment, especially forests, of the region. However, the final phase of production in the 20th century remains a little-explored episode. Between 2022 and 2024, an interdisciplinary project was therefore carried out focusing on research into the charcoal platform of the region's „last charcoal burner" Jan Matěj Mráček. The research was a unique combination of spatial approaches, standard excavation of the platform and its surroundings, during which the charcoal burner's temporary dwelling was documented, anthracological analyses with the use of historical-anthropological approaches: oral history, visual sources analysis and archival sources research. On this basis, it was possible to reconstruct the daily life at the charcoal burner's workplace in a much more comprehensive form than would have ever been possible using any archaeological methods alone.

11:30 *Ole Risbøl*
Large-scale wood tar production in mire kilns in Central Norway

From the Middle Ages (circa 1000 CE) onwards, the common method of tar production in Norway involved kilns constructed on flat or sloping forested terrain. During the production process, tar was drained horizontally from the kiln through a pipe into barrels. Another distinct and unique method of tar production is found in Central Norway, where thousands of tar pits are located in mires. These differ not only in their placement within a wet environment, but also in the production technique, as the tar flowed down into a water-filled pit beneath a wooden production platform.

This method is part of a large-scale, proto-industrial production system, evidenced by the presence of thousands of such kilns dating from the late 16th century onwards. The extensive production can be linked to a significant timber trade and should also be understood in relation to the simultaneous, widespread production of charcoal.

Results from a study of the spatial distribution of proto-industrial tar production pits in Mid-Norway and how their extent can inform us about the use of forest resources and their societal significance will be presented. The study is based on a combination of data from cultural heritage databases, LiDAR and archival materials.

11:50 *Rainer Schreg*
Fossil fields - new perspectives on medieval environmental history by DEM

Recently, survey authorities in many German federal states have launched high-precision digital elevation models (DEMs) on their geodata portals, available as WMS or open-access downloads. This development offers geographers and archaeologists the opportunity to conduct detailed and large-scale studies of fossil fields. The application of DEMs enables a revised assessment of previous research, often correcting and enhancing earlier surveys. Comparisons with older studies on fossil field systems reveal significant new research potential, particularly in uncovering relics of past agrarian land use in forested areas. Despite a long-standing research tradition, the integration of these new data with innovative theoretical approaches—viewing settlements and their agricultural land as components of human village ecosystems—enhances our understanding of medieval settlement dynamics. This paper will present examples from Southern Germany, showcasing various types of medieval fossil fields and their distribution, alongside more detailed analyses. Some sites illustrate a complex history of land-use changes, especially when combined with archaeological data, historical documents, and toponyms. Ultimately, this work emphasizes the importance of new data in comprehending medieval environmental history and advocates for increased scholarly attention to fossil fields as invaluable archaeological
sources.

11:10-12:30 Session 28B:
Landscape Archaeology of Riverine Environments

CHAIRS: *Markus Fuchs, Hans von Suchodoletz, Christian Tinapp*
LOCATION: U5 / 00.24

11:10 *Jan Miera and Hans von Suchodoletz*
Several millennia of settlement dynamics in the catchment area of the Weisse Elster river catchment, Central Germany

The presentation focuses on the Weisse Elster, a 250-kilometer-long tributary of the Saale River in Central Germany. Its source lies near the German-Czech border, tucked away in the so-called Elster Mountains close to the town of Aš. Since 2017, an interdisciplinary geoarchaeological project is exploring the prehistoric and medieval settlement of the Weisse Elster's catchment area between Leipzig and the border with the Czech Republic. Using a combination of methods from archaeology and soil science, the interplay between the Holocene geomorphological floodplain and slope dynamics, as well as variations in prehistoric and medieval settlement dynamics and climate changes in the loess-covered catchment area of the White Elster are investigated. The study area spans roughly 3,000 square kilometers and includes more than 3,000 archaeological sites—making it one of the most extensive diachronic investigations of its kind in Germany. The presentation focuses on practical and interpretive challenges of gathering and analyzing archaeological data in such a large region. Furthermore, selected settlement dynamics are used to discuss how human land use during prehistoric and historic periods may have shaped the riverine environment over thousands of years.

11:30 *Markus Winkler, Oliver Sass and Eva Lehndorff*
CHERMA – Changing river dynamics in the Eger/Röslau catchment since the late Middle Ages

Important drivers for change in river systems include mining associated with mills and smelters, as well as early industry, which have changed sediment and river dynamics, as well as causing contamination. We combine the use of human-introduced tracers with sedimentological investigations and dating techniques to further our understanding of fluvial geomorphology in the area. Tin and iron were mined and processed in the catchment areas and on the floodplains of the rivers Eger and Röslau. A chemical factory introduced mercury into the river system. Microplastics are a tracer of our modern age. PAHs (polycyclic aromatic hydrocarbons) are produced by burning, and their composition can be used to reconstruct changes in fire history and human activity. Dating is done directly via 14C and indirectly via Fe-crystallinity and related with the tracer contents, to further our understanding of river dynamics in the Eger and Röslau catchment since the late Middle Ages. The tracers are spread throughout the floodplain and exhibit distinct patterns that are associated with their sources and introduction to the system. PAHs demonstrate changes in composition and abundance with depth, suggesting changes in the type and quantity of burned material and fires in the catchment.

11:50 *Georg Stauch, Lukas Dörwald, Alexander Esch, Philipp Schulte and Janek Walk*
Tracing Human–Environment Interactions in a Central European Catchment: 115 Years of Sediment Deposition in the Urft Reservoir (Eifel, Germany)

River reservoirs act as sediment traps and long-term geoarchives of environmental change in riverine landscapes. This study examines the Urft Reservoir in the Eifel Mountains (Germany), which has been accumulating sediments from a 372 km² catchment since its construction in 1905. Using historical topographic maps and UAV-based digital surface models, we reconstructed 115 years of sedimentation. Spatially distinct depositional patterns reveal sediment hotspots related to water management. Geochemical analyses of core samples document changing pollution loads, especially during industrial phases of the 20th century, offering valuable insights into anthropogenic land-use dynamics such as mining, agriculture, and wastewater discharge. The impact of the extreme flood event in July 2021 was also evaluated. Our findings highlight the dual role of reservoirs: as tools for modern water management and as geoarchives reflecting both anthropogenic and natural landscape changes. This study contributes to the broader understanding of coupled human–river systems and demonstrates the potential of multi-proxy geoarchaeological methods in the study of fluvial environments and their hinterland.

12:10 *Isabella Denk*
Medieval Urban Planning on The Perpetually Wet Floodplain Of The Isar – Landshut in Lower Bavaria

In 1204, Duke Ludwig of the House of Wittelsbach founded both the castle and the town of Landshut on the banks of the River Isar in Lower Bavaria. While the castle occupies a prominent ridge of conglomerate rock, the town itself was established in the waterlogged and unpredictable alluvial plain below. Much of its layout appears almost as if designed on a drawing board. The decision to found Landshut at this particular site was driven by strategic and political motives. Over the ensuing centuries, the inhabitants sought to master the challenging and flood-prone terrain. They constructed buildings on wooden piles, laid plank walkways, and gradually raised the ground level of the town with layers of gravel and rubble ranging from just a few decimeters to almost four meters in thickness. These deposits are omnipresent—fascinating as evidence of everyday life in the medieval town—yet archaeologically, they can usually only be interpreted as terminus post quem indicators. What is certain after nearly four centuries of archaeological excavations is that the natural landscape at the time of Landshut's founding must have been an uneven, restless terrain, one that the town's inhabitants steadily leveled and reshaped over time.

11:10–12:30 Session 17B: Living Landscapes: Transdisciplinary Approaches to Heritage and Environment in Pompeii, the Amalfi Coast and Beyond

CHAIRS: *Dennis Mitschke and Ralf Kilian*
LOCATION: U5 / 01.17

Alkistis Thomidou
Embodied Cartographies: Relearning Landscape through Walking as Mapping

Our perception of landscape is shaped by mental images inherited from cultural traditions that teach us how to see. Yet these traditions largely reflect Western ideals—those of Roman poets, Renaissance painters, and English landscape gardeners—who defined how landscapes should be represented and valued. Thus, "landscape" emerges as both a collective inheritance and an individual experience, continually negotiated between received images and direct perception.

Walking offers a physical counterpoint to these inherited visions. It grounds us in real space and time, transforming movement into a form of mapping—an active, sensory engagement with the present. Through walking, the body becomes an instrument for perceiving and recording the world dynamically. In contrast, modern transportation accelerates travel, collapsing distance while dulling perception; we cross great expanses but register them only in fragments.

Mapping, therefore, becomes a vital means of reconnecting perception with place. It prompts reflection on authorship and perspective: Who maps, and for what purpose? How do mapping and movement reshape our understanding of space? During ACCE 2024, walks through the Parco Archeologico di Pompei and along the Amalfi Coast embodied this practice—acts of experiential mapping that intertwined memory, motion, and the living landscape.

Emma Sweeney
Crafting Recovery: Stonemasonry Training in Post-Conflict Heritage Landscapes

World Monuments Fund (WMF) is an independent organisation dedicated to safeguarding global cultural heritage. For 60 years, it has partnered with communities, funders, and governments to preserve architecture, strengthen local capacity, and address today's challenges, from climate adaptation to post-crisis recovery, through inclusive, community-driven heritage conservation.
The Syrian Stonemasonry Training Programme, led by WMF and supported by the British Council Cultural Protection Fund, was developed in response to the conflict in Syria. The initiative aimed to equip displaced Syrians and local Jordanians/Lebanese with traditional craft skills to improve livelihoods and support the restoration of heritage across the region post-conflict. Between 2017 and 2021, more than 80 participants completed basic and advanced training phases.

This contribution shares evaluation findings assessing the programme's sustained impact several years after completion. Trainees reported increased remuneration, promotions, and enhanced access to education. Beyond technical skills, participants highlighted improved foreign language ability, increased confidence, and enhanced intercultural understanding.

The initiative illustrates how heritage craft skills can foster sustainable livelihoods and resilient communities. It offers a transferable model for linking traditional knowledge and capacity building with the safeguarding of heritage in changing landscapes, supporting a more sustainable future for both people and place.

Solea Sartori
Cross-Regional Dialogues on Intertwined Cultural and Environmental Heritage: Transdisciplinary Insights from Pompeii and the Amalfi Coast (Italy) to AlUla (Saudi Arabia)

This contribution explores the dialogue between cultural and natural heritage in contrasting yet resonant landscapes: the Mediterranean environments of Pompeii and the Amalfi Coast, and the desert oases of AlUla in northwestern Saudi Arabia. Both regions reveal long histories of human adaptation to challenging environments, where settlement patterns, agricultural practices, and cultural expressions emerged in close response to the landscape's ecological conditions.

Drawing on the transdisciplinary framework proposed during the 2024 Academy of Conservation and Care for the Environment (ACCE), the paper reflects on how the concept of "living landscapes" can be explored beyond the Mediterranean. In AlUla, the coexistence of monumental archaeology, oasis ecosystems, and desert habitats invites a reconsideration of the balance between environmental dynamics and cultural practices. The adaptive strategies developed by ancient inhabitants to sustain life in arid conditions resonate with current efforts to integrate conservation, sustainability, and community engagement.

By placing these two contexts in dialogue, this contribution highlights the potential of cross-regional perspectives to inform innovative global, yet site-tailored models of heritage stewardship and environmental care, expanding the ACCE approach to new ecological and cultural contexts.

11:10–12:30 Session 31B: What is the future of surface survey? Rethinking new and old methods for landscape archaeology

CHAIRS: *Enrico Giorgi, Giacomo Sigismondo, Veronica Castignani, Francesca D'Ambola*
LOCATION: U5 / 01.22

11:10 *Michael Doneus, Nives Doneus and Martin Fera*
Revealing complex land use patterns in 'off-site' areas: A spatio-temporal interpretation of airborne LiDAR-derived feature models in a Mediterranean karst area in Croatia

Landscapes reflect the activities of their inhabitants, which renders them an essential source for reconstructing past societies. Field surveys are based on the premise that these activities can be inferred from surface finds. However, the method has limitations in landscapes void of artefact scatters or which are difficult to access. Different methods are required here. Our presentation will introduce such a landscape located in the southern part of the island of Cres in Croatia. The dense scrub vegetation makes access difficult, and no artefact scatters are visible. However, LiDAR-derived digital feature models have revealed remains of past land use practices, including dry stone walls, enclosures, terraces and lime kilns. Interpreting these feature models allows us to take a spatio-temporal approach within the framework of GIS and the Harris Matrix, revealing a wealth of information on a complex sequence of human activity, including several phases of agricultural land use. The stratigraphically oldest phase was characterised by walls from a Roman land division. These findings demonstrate that different landscapes necessitate distinct approaches. Therefore, the future of surface survey lies in their integration with other forms of archaeological prospection. This also requires us to rethink the concept of a 'site'.

11:30 *Luca Mauri, Nicolò Anselmetto, Matteo Domanico, Gabriele Sartorio, Ambra Idone, Natascia Druscovic, Dante Marquet and Matteo Garbarino*
Revealing the Past from Above: Integrating Field Data and LiDAR to Map Historical Features in the San Grato Forests (Aosta Valley)

The reconstruction of past features has traditionally relied on field surveys and historical knowledge. However, recent advances in remote sensing techniques enabled the acquisition of detailed information across wide areas, highlighting the need to reconsider the utility of field data collection. In this study, historical features such as ruins, dry stone walls, drainage channels, pathways, buildings, and historical infrastructures within the San Grato valley (Aosta Valley, Italy) were mapped through aerial LiDAR data processing. A 1 m resolution Digital Surface Model was elaborated, and a set of morphometric indicators - including maximum curvature, profile curvature, surface roughness, and Topographic Position Index - was derived to identify archaeological remains across the study area. Field surveys were conducted to collect the location and different typologies of features, also identified from past reports, archival sources, and cadastral maps. The spatial mapping of detected features was validated using field information to assess the accuracy of their predicted locations and improving their automated identification from LiDAR data. Results indicate that field surveys remain essential for refining the processing of remotely sensed data for feature extraction across large areas and uncover archaeological features in complex environments and remote zones.

11:50 *Tymon de Haas and Manuel Peters*
Beyond field walking:
recent experiences from Italy and Spain

Systematic field walking has been a fundamental instrument in researching Mediterranean Landscapes for more than half a century. While archaeologists have long been aware of the limitations of this approach, and have long integrated other sources (e.g., aerial photography and historical data) to reconstruct past landscapes, a wide array of new methods and data has become available over the past decades. This paper discusses how the Groningen Institute of Archaeology has in its recent projects in Central Italy and Spain attempted to integrate these technologies (e.g., geophysical survey, coring, drone-based remote sensing) with traditional approaches. It is argued that field surveying remains a crucial approach in providing qualitative chronological and typological information about sites and land use patterns. In some contexts (and for specific research questions), however, remote sensing data may become leading in research design while field walking becomes one of a suite of complementary approaches.

12:30-14:00 **Lunch Break**

14:00–15:40 Session 18C:
Tracing back historical land-use and its legacies: common insights and perspectives of landscape archaeology and historical landscape ecology

CHAIRS: *Sjoerd Kluiving, Rebekka Dosche, Nik Petek-Sargeant, Valentina Pescini, Anneli Ekblom, Paul Lane, Giovanna Pezzi, Bennie Shen, Marianna Biró, Matthew Davies*
LOCATION: KR12 / 02.18

Matylda Brecz
Small Fires, Long Histories: Using Hearths to Explore Human-landscape Interactions in Prehistoric North-western Arabia

Significant research in north-western Arabia has often privileged monumental archaeological features. However, attention to smaller features, critical for understanding human-environment interactions (e.g. mobility, resource exploitation), has remained limited. This research focuses on fire installations (i.e. hearths) as critical but under-analysed evidence of human presence and landscape use in AlUla County, Saudi Arabia. Frequently recorded during ground survey yet rarely subjected to detailed analysis, hearths are more than just repositories of dateable material – they are physical expressions of human decision-making and engagement with the landscape. Their construction, placement, and proximity to other features – archaeological, topographic, and hydrological – reflect the complex choices of past peoples in how they navigated and inhabited north-western Arabia's dynamic environments. Despite millennia of climatic change, the repeated use of specific locations indicates enduring patterns of land-use only made visible through an integrated archaeological and environmental approach. By analysing the characteristics of hearths, and mapping their spatial distributions across AlUla's varied geography, this research foregrounds the importance of non-monumental features in reconstructing human-environment interactions in north-western Arabia, and contributes to the interpretation of prehistoric mobile lifeways across broad timescales and changing environments.

Antonio Merola and Matteo Gemma
Mapping Ancient Agriculture:
A GIS-Based Reconstruction of the Valle Peligna Landscape (Abruzzo, Italy)

This paper presents the methodology and preliminary results of a spatial analysis aimed at assessing the natural agricultural potential of historical landscapes, excluding any form of anthropic modification. The case study focuses on the Valle Peligna, in the Abruzzo region of Italy. The analysis identifies and classifies areas according to their intrinsic environmental characteristics (such as soil type, slope, drainage, and exposure) to model zones of potential agricultural suitability under natural conditions. These spatial results are compared with historical, epigraphic, and archaeobotanical evidence to evaluate the correspondence between the modeled natural potential and ancient land-use patterns. By isolating environmental variables from human influence, the study proposes a framework for reconstructing the ecological basis of agricultural systems in the past. All analyses were conducted within the open-source GIS platform QGIS, integrating data from national and regional geoportals. The results highlight how open geospatial tools can effectively support interdisciplinary research on historical landscapes, providing a reproducible method for understanding the environmental foundations of ancient economies.

Johannes Schmidt, Leon Westphal, Stephan Roller, Reinhard Rademacher, Peter Kühn, Lukas Werher and Aline Kottmann
Historic Ridge-and-Furrow Landscapes as Regulators of Soil Erosion:
Quantifying Anthropocene Surface Change

Historic ridge-and-furrow fields represent anthropogenic microreliefs that act as geomorphological key signatures of the Anthropocene. Building on this perspective, the study addresses a central desideratum: understanding spatially explicit, long-term changes in erosion patterns driven by human land use. Using high-resolutionLiDAR data and a GIS-based Universal Soil Loss Equation (USLE) model, we compare two scenarios — the preserved ridge-and-furrow topography and a flattened, hypothetical surface. The results reveal that the historic microrelief reduces overall erosion susceptibility and reorganizes the spatial distribution of erosion. This finding underscores that past cultivation systems were not only cultural artifacts but also functional regulators of soil erosion. From an Anthropocene perspective, ridge-and-furrow landscapes embody enduring geomorphic legacies, linking historic land management to present-day surface processes. Their persistence highlights the need to investigate such anthropogenic signatures as indicators of area-wide erosion transformations and as potential templates for sustainable soil management in the face of ongoing climatic and land-use change.

14:00–15:40 Session 24A:
Diachronic Change, Communal Agency and shifting Power Relations in Rural Landscapes

CHAIRS: *Luigi Pinchetti and Valerie Palmowski*
LOCATION: U5 / 01.17

14:00 *Valerie Palmowski and Luigi Pinchetti*
Introduction

14:20 *Valerie Palmowski and Luigi Pinchetti*
Rethinking Power: Heterarchies in Post-Roman European Landscapes – Evidence from the Rhineland and Central Italy in the 4th to 9th century

In the last decades, our understanding of past societies, long dominated by hierarchical theory, has gradually opened up to alternative concepts describing social relationships and networks. One of these approaches is the concept of heterarchies. Its structures are envisioned as laterally rather than vertically connected. Heterarchies and hierarchies are not necessarily independent or mutually exclusive concepts. In this paper, we explore how the combination of the concept of heterarchies and hierarchies offers new insights into the landscape of power dynamics of the 4th to 9th centuries. Two case studies from different regions of the Post-Roman world are presented. The first case study focusses on rural landscapes in the late antique and early medieval Rhineland. Using burial evidence, it traces changes in social networks, including both local as well as regional interactions visible in the material culture. The second case study from Umbria, Central Italy, relates survey data to evidence from hagiographic sources to connect the evolution of the local economic network in the post-Roman period was influenced both by regional economic changes, but also by the local cultic landscape. Both case studies discuss old and new concepts of power dynamics and their visibility within social spaces.

14:40 *Maxime Durocher and Deniz Burcu Erciyas*
Rulers, clerics and peasants: authorities and the shaping of landscapes in the Komana plain (Turkey)

As a rural town situated in the basin of the Yeşilırmak River (ancient Iris) in northern Türkiye, the site of Komana had benefited over the centuries from its strategic control of regional roads and from the fertile plain that supported its economic growth. Known as a temple-state during the Hellenistic period, Komana later became the center of a bishopric and monastery in the Byzantine period and hosted several Sufi lodges during the late medieval and Ottoman eras. This paper explores how the negotiation between political and religious authorities impacted the management of agrarian resources and settlements patterns, and how these multiple authorities, together with local communities, shaped the landscapes of the valley. While maintaining a broad chronological frame – from the Hellenistic period to the Ottoman Empire -, the study focuses particularly on the medieval and early modern periods. New survey data and mapping analysis, combined with the study of epigraphic and textual sources as well as archaeobotanical evidence unearthed at the site over the past two decades, provide new insights into the evolution of settlement, landscape, and land-tenure systems during a period marked by the co-existence of competing authorities and the emergence of autonomous enclaves led by local communities.

15:00 *Katarzyna Ślusarska, Michał Adamczyk, Jacek Karmowski, Marissa Ramsier and Katherine Menor*
Landscape, Power, and Population in a Cistercian Pomeranian Microregion: elewo (Site 1–3), Poland

The Żelewo cemetery serves as a lens, bringing into focus the intersecting dynamics of the 13th–14th centuries: the early formation of the Duchy of Pomerania, a politically driven Christianisation, and overlapping power structures—knightly, ducal, and monastic. Fertile soils, forests, and a river–lake route linking inland Pomerania to the Oder and the Baltic shaped production, exchange, and settlement. The Cistercian estate grew from an earlier knightly domain and developed a well-organised network of farms, mills, and trading posts. Two nearby hillforts, located between the Kołbacz monastery and the Żelewo cemetery, likely mark that earlier, knightly estate. Written records note further land grants to the monastery and repeated episodes of in-migration and relocation of settlers. Together, these elements create a multi-layered web of connections in the Żelewo microregion. Our study combines bioarchaeology, landscape archaeology, and history. Stable-isotope analyses ($\delta^{13}C/\delta^{15}N$, $^{87}Sr/^{86}Sr$) and parasitology provide insight into diet, living conditions, and mobility over the life course. Whereas osteological analyses help understand occupation and stress within the group using the cemetery. Spatial analyses help contextualise authority and resource provisioning. Taken together, these lines of evidence show how religious, feudal, and communal hierarchies shaped everyday life in medieval Pomerania.

15:20 *Christoph Spörlein and Ralph Großmann-Klabunde*
The Emergence and Reproduction of Social Inequality in Prehistoric and Protohistoric Societies: Combining Behavioral Genetics and Archaeological Approaches

This project integrates recent developments in sociology and archaeology to advance an interdisciplinary understanding of the origins and reproduction of social inequality. Both disciplines increasingly employ genetically informed approaches, albeit with distinct conceptual orientations. The project aims to synthesize these perspectives to generate new insights into the structure and dynamics of prehistoric societies. In sociology, the measurement of genetic potentials has become an important tool for describing the magnitude and transformation of social inequality. The extent to which genetic variation contributes to individual social positioning provides indirect evidence for the rigidity of social structures: stronger genetic effects imply weaker constraints imposed by ascriptive traits such as social origin or gender. Spatial and temporal variation in these effects thus reflects the institutional and normative foundations of inequality. In archaeology, analyses of ancient aDNA have predominantly focused on migration and population history. However, these data also permit the construction of genetic potential measures that, when combined with detailed archaeological records of burial contexts, can serve as indicators of social status. By linking sociological theory with archaeological and genetic evidence, the project seeks to reconstruct patterns of inequality from the Neolithic Age onward, thereby illuminating the institutional roots of stratification in human prehistory.

14:00–15:40 Session 10C:
Modelling demography through archaeological data: from theoretical approaches to global case studies

CHAIRS: *Michele Abballe, Francesca Chelazzi, Alessio Palmisano, Dan Lawrence*
LOCATION: U5 / 02.17

14:00 *Sara Scaglia, Giulio Lucarini, Katie Manning and Stefano Biagetti*
Coexisting with uncertainty in Mediterranean Africa and Sahara: a land use study throug hout the Holocene.

Over the last years, climate change has increasingly been the subject of regional and global studies targeted at reconstructing past population dynamics and human-environment interactions. However, Mediterranean Africa and the Sahara are still understudied, partly due to patchy data availability. As a part of the MSC-DN AGRI-DRY project, my doctoral research aims to investigate land use in North Africa over the Holocene through the use of big data collected in legacy data. An extensive database (georeferenced 14C data together with land use labels) and a multi-proxy (archaeozoological and archaeobotanical) dataset are utilised to study how humans adapted their subsistence practices during major climate shifts. This paper has a particular focus on agricultural practices and pastoralism from a diachronic perspective in selected case studies within the investigated areas. The most used land use models, HYDE and KK10, struggle to detect human impact in dry areas. My research aims to generate a land use model in the Holocene that deals with uncertainty and provides a better understanding of the environment and people's dynamics in Mediterranean Africa and the Sahara, driven by a changing climate.

14:20 *Francesca Chelazzi*
Mind the Gap: From Macro-Trends to Local Lives in Bronze Age Cyprus

Recent pan-regional studies have established broad demographic trends for the Near East, including robust island-wide patterns for Cyprus using multi-proxy (Palmisano et al. 2021) and probabilistic frameworks (Arthur et al. 2023). While these models provide an essential macro-scale foundation, they prompt a key question: how did these large-scale histories manifest at the regional level? This paper presents the logical next step: a high-resolution, regional case study designed to explore the socio-ecological diversity underlying the island-wide narrative. I focus on Bronze Age southwestern Cyprus, drawing upon a rich settlement dataset, co-analysed with bioarchaeological, environmental, and palaeoclimatic data. By integrating archaeodemographic analysis with techniques such as Geographically Weighted Regression and multi-scalar cluster analysis, I move beyond demographic curves to map how environmental drivers and settlement patterns varied spatially. The obtained results reveal a distinct regional trajectory in the southwest that is blurred in broader models. I argue that this methodological pipeline – from island-wide models to high-resolution regional analysis – is essential for a nuanced understanding of past population dynamics. This fine-grained approach helps to guard against spurious correlations by testing macro-scale assumptions against local-scale data, revealing where apparent island-wide trends may, in fact, be the product of aggregated, divergent regional signals.

14:40 *Andrea Titolo and Alessio Palmisano*
Cyclical Dynamics Between Climate and Population: a Multi-Proxy Approach from the South Levant

Recently, in the framework of a revitalised interest in the relationship between demography, social complexity, climate change, and historical events, a growing number of studies have demonstrated how multi-proxy approaches are best-suited for reconstructing past demographic trends. Recent studies also emphasised how the relationship between climate and population should be understood as cyclical, with periods of positive and negative correlations between the two. These approaches leverage the growing availability of freely available radiocarbon databases, archaeological and paleoclimate data, and advanced statistical methods for dealing with data limitations.

The South Levant is in a privileged position for these kinds of analyses, given the large quantity and quality of data available. While past studies have already highlighted its long-term demographic fluctuations, a multi-scalar analysis that will employ state-of-the-art statistical methods to systematically examine the climate-population nexus and long-term socio-ecological dynamics is still missing.

Here we will illustrate sub-regional demographic fluctuations in the South Levant, evaluate cycles of climate-population relations, and tackle long-standing issues related to the historical trajectories of the region in the Iron Age. We will do so by adopting a long-term multi-proxy approach by making use of a carefully crafted dataset composed of radiocarbon dates, archaeological sites, and palaeoclimate proxies.

15:00 *Dan Lawrence, Iza Romanowska, Katherine Crawford and Alessio Palmisano*
Measuring and Explaining Population Churn in Southwest Asia over the Holocene

Southwest Asia represents an excellent region in which to analyse past settlement dynamics because of the long history of both complex societies and archaeological study. It is also a predominantly dryland environment, meaning small changes in precipitation can have dramatic effects on local affordances. Diachronic settlement studies have tended to use substantial declines in population as evidence for societal collapse, with regional variation demonstrating pockets of resilience. However, these do not take into account baseline rates of settlement abandonment and new occupation, making it hard to distinguish between stochastic variation, long-term patterns, and the sorts of short-term events which might result from exogenous shocks. Here we investigate population trends and settlement dynamics in the study region using a combination of computational methods applied to a dataset of over 20,000 sites. We utilise the concept of 'churn', meaning net settlement changes over time, to detect variations from baseline trends and explore correlations with climate and political shifts. Our results demonstrate a surprising stability in the formation, abandonment and persistence of settlements over time, which holds across shifts in overall population levels and between rural and urban sites. This has implications for how we think about sustainability and resilience using archaeodemographic data.

15:20 *Maria Pia Maiorano and Eugenio Bortolini*
Lithic variability and population trends in Early and Middle Holocene Southern Arabia: A quantitative perspective

This paper introduces a quantitative framework that integrates lithic attribute analysis into the reconstruction of demographic trends, exploring long-term relationships between technological variability, population change, and environmental dynamics in Southern Arabia during the Holocene Humid Period (12,000–5,000 cal BP). Building on a regional dataset of over 1,200 projectile points, attribute-based classification generates standardized descriptors of technological change, allowing for direct comparison with other quantitative proxies. These technological data are analysed through aoristic and frequency methods and correlated with demographic signals derived from 350 radiocarbon dates and paleoclimatic records from speleothems. The integrated multiproxy approach enables the reconstruction of population fluctuations and adaptive responses within arid landscapes, refining the temporal and causal links between human behaviour, technological innovation, and climatic variability. By demonstrating how lithic technology can serve as a demographic proxy, this study contributes to methodological advances in archaeodemography and highlights the potential of reproducible, statistically grounded approaches to infer human adaptive strategies in prehistoric contexts.

14:00-15:40 Session 14C:
Re-discovering Mountainscapes:
An Interdisciplinary Approach to Mountainous Areas

CHAIRS: *José Abellán Santisteban and Ylenia Paciotti*
LOCATION: U5 / 01.18

14:00 *Rafał Bieńkowski*
Mountain landuse in the Venetian Sitia Province

The landuse of the mountainous regions of Crete was one of the most critical concerns during the Venetian period (1204-1669). Sitia Province covered easternmost part of the Crete, and traditionally was considered as one of the least populated. The small group of inhabitants were scattered between various mountains plateaus, isthmuses, and plains. Mountains areas were as important, for local societies, as scarce plains regions, especially in the investigated region.

In presentation the author will attempt a reconstruction of the settlement pattern and connection between different sub-regions of Sitia Province in Venetian Period. Special focus will be given to the different examples of mountain regions, their landuse and to the connection to scarce coastal plains. For the presented investigations, archaeological evidences, historical sources and GIS tools and methods will be used.

14:20 *Andrés Menéndez-Blanco*
A source at risk of disappearing. Returning to place names and their potential for analysing mountain landscapes in Southwest Europe

Since the origins of archaeology, researchers have used place names as a complementary source. However, as Elisabeth Zadora-Rio pointed out in 2001, combining oral and material sources is not always straightforward and can lead to incorrect analyses and forced interpretations. Nevertheless, greater stability in place names has been observed in mountain areas, and the potential for combining oral, written and material sources to construct more robust interpretations of changes in medieval and post-medieval landscapes has been demonstrated. A detailed study of toponymy, and oral tradition in general, also enables a better understanding of the relationship between communities and their environment, opening up interesting avenues for community archaeology projects. Unfortunately, the ongoing process of rural depopulation throughout Europe has resulted in the loss of numerous place names that have not yet been documented or analysed. This paper will focus on: (1) illustrating the capabilities of toponymy and oral tradition as valuable sources for landscape archaeology in mountainous contexts; and (2) raising awareness of the risks of losing this intangible heritage, and of the role we must play in conserving it. In order to illustrate this points, a series of practical examples will be presented from the north-west of the Iberian Peninsula.

14:40 *Adele Repetto, Laura Moro and Anna Maria Stagno*
Territorial relations and connections in the Ligurian Apennines: an interdisciplinary approach in the case studies of Rovegno and Borzonasca (17th–21st Century)

The paper analyses the dynamics of interaction, circulation, and resource management in the mountain territories of the western Ligurian Apennines, highlighting the relationships that shaped the organization of spaces and activities between the 17th and 21st centuries and their transformations. These territories, long at the centre of research by the Laboratory of Archaeology and Environmental History at the University of Genoa, are today partly abandoned and considered marginal, though once strategic in linking the Ligurian coast and the Po Valley. The paper presents two case studies: the territories of Rovegno (Trebbia Valley) and Borzonasca (Sturla Valley). In the first case, field surveys and cartographic analysis made it possible to identify traces of historical routes and agro-silvo-pastoral activities, along with their transformations. In the second, the analysis of documentary sources (livestock and transhumance contracts) enabled the reconstruction of the valley's social morphology, land ownership relations, livestock circulation, and the use of common resources, also allowing comparison with landscape archaeology surveys. Through a comparative analysis and the integration of different sources, the research reflects, how mountain territories once central to complex economic, political, and social networks are today perceived as peripheral, and how this notion of "marginality" can obscure their ongoing complexities.

15:00 *Cecilia Conati Barbaro and Luca Forti*
Long-term human–environment interaction in the central Apennines uplands based on geo archaeological survey in the Rascino Plateau (Latium, Italy)

Mountain landscapes are increasingly recognised as dynamic cultural spaces rather than marginal environments. The Rascino Plateau (1150 m a.s.l.), a closed karst basin in the central Apennines with a perennial lake, represents a valuable case for investigating long-term upland occupation from a geoarchaeological perspective. This paper presents the first results of the Archaeological Landscape Survey at Rascino (ALSRaP), which integrates remote sensing, archaeological survey, and geomorphological and pedological observations. The aim is to reconstruct late Quaternary palaeoenvironmental conditions and to investigate land-use strategies, hydrological variability, vegetation history, and anthropogenic impact during the Holocene in a montane environment. The survey was based on subdividing the landscape into geomorphological units rather than adopting a site-based approach. Surface evidence includes dispersed lithic materials, ceramics, and clusters of dry-stone enclosures interpreted as pastoral structures. Their patterned distribution along slope breaks, palaeoshorelines, and seasonal water sources suggests recurrent exploitation of specific topographic niches for short-term and seasonal activities. Moreover, sediment reworking, slope instability, and colluvial transport are recognised as major agents reducing archaeological visibility and fragmenting assemblages. These integrated results challenge narratives of upland marginality by demonstrating structured mobility, pastoral land-use systems, and persistent human engagement in the upland landscapes of the central Apennines.

14:00-15:40 Session 15C:
Terraced landscapes as longterm socio-ecological archives

CHAIRS: *Ralf Vandam, Soetkin Vervust, Axel Cerón González, Antony Brown*
LOCATION: U2 / 01.33

14:00 *Xavier Agulló Máñez, Mario Gutiérrez Rodríguez and Ignasi Grau Mira*
Tracing Agrarian Transformations through Terraced Landscapes in Eastern Iberia: A Multi-Scalar Analysis of La Fernoveta (Ibi, Spain) from Iron Age until now.

Terraced landscapes are among the most visible and enduring traces of human adaptation to complex topographies, reflecting long-term socio-ecological interactions. The site of La Fernoveta (Ibi, Alicante, Spain) offers an exceptional case study for exploring these dynamics, providing a diachronic record of agricultural transformation from the Iberian Iron Age to the present day. The site is located in the mountainous interior of eastern Iberia, in a landscape that encapsulates centuries of human effort to cultivate, manage, and inhabit a calcareous and erosion-prone environment. Through a multi-scalar methodological approach, we have integrated landscape-scale GIS interpretation, surface and subsurface geophysical surveys, and microscale analytical techniques such as soil micromorphology, physicochemical, and geochemical studies. The microstratigraphic record of La Fernoveta provides a rare window into the daily routines, social organization, and environmental awareness of rural groups across different moments, with their own terrace systems both differentiated and overlapping through time. Beyond the technical dimension of terrace management, the site allows us to approach the archaeology of peasantry, tracing how agricultural practices both shaped and reflected broader socio-political and environmental transformations.

14:20 *Josu Narbarte, Mattin Aiestaran and Eneko Iriarte*
Terraced Landscapes as Socioecological Infrastructures: Geoarchaeological Insights from the Western Pyrenees

This contribution investigates the emergence, transformation, and socioecological significance of terraced agrarian landscapes in the western Pyrenees through an integrated geoarchaeological approach. We focus on two emblematic contexts: the subatlantic Baztan valley, characterised by long-lived village settlements and a progressive sequence of early modern agrarian transformations, including the introduction of New World crops; and the fortified landscape of Ujué in the Ebro–Pyrenean transition zone, defined by a network of protohistoric and early medieval settlements around strategic hilltops, closely associated with processes of incastellamento and high medieval rural reorganization. Comparative sediment cores from these regions reveal how archaeosedimentary sequences encode distinct modes of land appropriation, agricultural management, and resilience strategies. By integrating micromorphology, geochemistry, and historical sources, this study frames terraced slopes simultaneously as infrastructure and archive: enduring socioecological devices through which Pyrenean communities navigated environmental constraints and political transformations over the last millennium.

14:40 *Damián Romero Perona, F. Javier Sánchez-Palencia Ramos, Juan Luis Pecharroman Fuente, Almudena Orejas Saco del Valle, Brais X. Currás Refojos, Jose Antonio López Sáez and Mónica Ruiz Alonso*
Roman Agricultural Terraces in the Arribes del Duero (Spain and Portugal)

The "Arribes del Duero" is a natural gorge that marks the landscape of the Zamora and Salamanca (Spain) and Eastern Tràs-os-Montes (Portugal) regions, but at the same time it is a space heavily transformed by human activity throughout time with settlements, petroglyphs, fords and numerous cultivation terraces. Settlements like San Pelayo (Almaraz del Duero), Peña Redonda (Villardiegua de la Ribera) or São João (Aldeia Nova) have cultivation terraces besides them that were made during Roman period and that they have remained fossilized in the landscape until nowadays and were used by local communities until the 20th century.

This paper presents the results of the archaeological excavation of two of these terraces, Peña Redonda and São João, and the anthracological and palynological data that we obtained from the samples colleted during the excavation. From them we have been able to reconstruct the crops and environment changes of this area from Roman times up to the present day.

15:00 *Juan José Algaba Torrealba and Adalberto Ottati*
The terraced landscape of latium: a technical question

This paper explores the development and technical evolution of terraced construction in ancient Latium, analysing how Roman builders adapted architectural solutions to steep and uneven terrains. It examines the progressive refinement of retaining walls, substructures, and leveling systems that characterised Italic and later Roman architecture, with particular attention to the Late Republican period. Terracing techniques not only addressed practical topographical challenges but also reflected aesthetic, ideological, and socio-economic transformations through which the elites reshaped the landscape via monumental architecture and villa complexes. Combining archaeological and architectural approaches, the paper questions the traditionally assumed Hellenistic influence on these construction methods and instead argues for their development within a local Italic technical tradition. The case studies from Tibur, Praeneste, Gabii, Lanuvium, Nemi, and Terracina illustrate how these engineering strategies became integral components of the cultural and symbolic landscape, mediating between natural morphology and the expression of power, identity, and otium in Roman society. Ultimately, such a profound transformation of the territory resulted in the creation of a distinctive landscape whose economic and social connotations remain visible today.

15:20 *Miguel Robledillo Sais, Cristina Martínez Álvarez, Juan Manuel Gutiérrez Andrades, Sergio Adamuz Osuna and Guillermo García-Contreras Ruiz*
Exploring Early al-Andalus: Settlements and Terrace Systems in Central-Southern Valencian Rural Landscapes

The period spanning the 8th, 9th, and early 10th centuries remains relatively understudied in the Valencian Country compared to later phases of al-Andalus. This is largely due to the scarcity of written sources and the limited number of archaeological projects targeting this timeframe. This knowledge gap is particularly pronounced in the central-southern areas of the Valencian Country. In this presentation, we aim to shed light on a series of rural settlements in this area that have previously been attributed to earlier or later chronologies. By reanalyzing existing archaeological reports and undertaking new survey campaigns in 2024 and 2025, we have uncovered evidence indicanting their occupation during the early centuries of al-Andalus. Key methods include spatial analysis using GIS tools and detailed study of the materials recovered during these surveys.

Our findings allow us to propose hypotheses about the spatial organization of these settlements, encompassing residential areas and associated agro-pastoral zones, specially the dry-farming terrace systems. These results not only enhance our understanding of rural dynamics in early Andalusi Valencian landscapes but also address broader questions about settlement patterns and land use in a poorly underexplored historical context.

14:00–15:40 Session 28C: Landscape Archaeology of Riverine Environments

CHAIRS: *Markus Fuchs, Hans von Suchodoletz, Christian Tinapp*
LOCATION: U5 / 00.24

14:00 *Renske Hoevers, Bob Simons, Ward Swinnen, Marleen van Zon, Bart Vanmontfort and Gert Verstraeten*
Holocene river system transformations in NE Belgium: catchment-scale human-environment interactions as drivers of local change

During the Late Holocene, many temperate European lowland river systems transitioned from multichannel rivers in densely vegetated peatlands to single-channel, meandering rivers with overbank deposits in open floodplains. While this geoecohydrological shift is well-characterized, its timing varies across and within catchments. To explore the causes of these differences, we adopt an interdisciplinary approach, integrating long-term and large-scale reconstructions of floodplain geoecohydrology and upland land cover change with reconstructions of human demography and land use. We focus on the central Belgian loess belt and compare its evolution to that of the adjacent sandy Campine region. In both regions, upland forest clearances near floodplain sites, driven by population growth and agrarian expansion, led to changes in floodplain wetness and localized colluviation. Catchment-scale improvements in hillslope-floodplain connectivity initiated alluviation in the valleys, enabling the transformation from forested marshes to open floodplains. Over time, floodplains responded more quickly to upland land cover changes, likely due to this increasing hillslope-floodplain connectivity. Today, peat growth frequently persists in floodplains in the sandy region but has become rare in the loess belt, where higher human pressure and soil erodibility facilitated a complete floodplain transformation. This ultimately enabled human settlement in floodplains, laying the foundations for today's landscape.

14:20 *Jos De Moor, Ellen Arler, Silvain Rumping and Timo Vanderhoeven*
Geo-archaeological investigations in different sized catchments in the southeastern Netherlands: documenting human presence in dynamic fluvial and colluvial environments

The province of Limburg in the southern Netherlands contains large areas of fertile arable land, but the landscape is also very vulnerable to flooding and soil erosion. With future climate change, these processes are likely to happen more often. Therefore local and national authorities are preparing and carrying out measures to reduce and prevent future flooding and soil erosion related problems, like dike reinforcements, river widening, re-meandering of rivers and rainwater buffering in small and large scale catchments.

In the Netherlands, archaeological research is compulsory prior to construction activities. Therefore during the last several years numerous archaeological (prospection) projects with a strong geo-archaeological focus have been carried out in these areas, revealing many new insights in the local and regional landscape development and the relation between landscape dynamics and human presence and activities. Results of these project not only reveal new insights in the landscape – man relation, but also on human adaptation to environmental change.
During the presentation we will focus on Holocene catchment dynamics and development, including fluvial and colluvial processes. In addition we will present results of large-scale prospection projects focusing on the relation between river terrace development and human presence in the Meuse river valley.

14:40 *Josu Narbarte, Eneko Iriarte and Aritz Díez Oronoz*
Human Shaping of Fluvial Landscapes: A Geoarchaeological Approach on the Barthes de l'Adour (Aquitaine, France)

This paper examines the long-term interaction between human societies and the fluvial environment of the Barthes de Guiche along the Adour River in southwestern France. Combining landscape archaeology, historical sources, and geoarchaeological approaches, including core analyses and stratigraphic characterization based on physico-chemical indicators, the study documents centuries of anthropogenic transformation of the fluvial plain. Human interventions, such as drainage, embankments, and land management, reveal a sophisticated understanding of fluvial dynamics, including flood control and soil management, which supported stable settlement and agricultural practices over time. The landscape reflects a dynamic interplay between ecological constraints and socio-economic strategies, encompassing land reclamation, crop cultivation, and settlement organization. By integrating stratigraphic and archaeological data, the research highlights the feedback mechanisms between riverine environments and human activity, illustrating how long-term land-use practices shape both ecological and cultural heritage. The Barthes de Guiche thus exemplify a living fluvial landscape, where environmental and societal processes are closely intertwined.

15:00 *Gilles Rixhon, Timothée Jautzy, Nicolas Jacob-Rousseau, Salomé Berthier-Laumond and Laurent Schmitt*
Quantifying human impact during industrialisation on the evolutionary trajectory of Vosgian streams (NE France): the value of documentary archives

Since the Industrial Revolution, European rivers have faced increasing anthropogenic pressure through channelisation, rectification, and construction of many dams and weirs. The Vosges Mountains epitomise this anthropisation, with approximately 5,000 hydraulic structures (HS), primarily levees and weirs, built across its main streams. Edification periods of HS in smaller catchments remains largely unknown yet, thereby hindering the reconstruction of environmental and human impact timelines. This study investigates the spatio-temporal development of anthropogenic influence on three major streams in the southern Vosges—Fecht, Vologne, and Moselotte—focusing on morphodynamic changes since the late 18th century. We use extensive archival resources, including construction requests, plans, and reports from the 18th to 20th centuries. We first map existing HS to create an updated database, then date their construction and, in some cases, removal. We also reconstruct the diachronic evolution of the channel pattern, using ancient topographic maps and orthophotos (1866-2018). We provide first quantification of human influence, with a cluster of weir construction during the mid-19th century. We also identify a strong correlation between HS construction and channel simplification. This study demonstrates the value of historical records to usefully complement fieldwork and to thereby better understand long-term human impacts on river systems.

15:20 *Marek Dworaczyk, Andrzej Piotrowski and Paweł Sydor*
An attempt to locate early medieval hillforts at the mouth of the Świna River in the light of a morphostratigraphic analysis of dune and spit embankments

The medieval chronicler Saxo Grammaticus, describing the Danish expedition to the mouth of the Oder in the year 1184, also mentioned that two strongholds located at the mouth of the Świna were destroyed during the expedition. These strongholds were most likely built between 1177-1182. Despite searches, it has not been possible to determine the exact location of either of these strongholds. Today, however, it is possible to narrow down the search area. This is made possible by a morphostratigraphic analysis of the three types of dune-spit embankments found in this area. This analysis, combined with field prospecting and an assessment of the geological and engineering conditions of the mouth of the Świna River, indicates that the most likely locations are the base of the south-western headland of the island of Wolin (Łęknica) and the Mielinek Peninsula. This is the area where the Stara Świna river changes its direction from latitudinal to meridional. Therefore, there are favourable conditions here for observing the waterway both towards the sea and towards the stronghold in Lubień. In addition, the riverbed is narrowest here, and the hilly and marshy terrain could have been an additional natural defensive barrier.

14:00-15:40 Session 21C:
Forests as Archives: Interdisciplinary approaches to explore the woodland geoarchaeological record

CHAIR: *Anna Schneider*
LOCATION: U5 / 02.22

14:00 *Aze Peeters and Koen Deforce*
Charcoal Kilns as Palaeoecological Archives: Tracing Woodland Dynamics in the Sonian Forest (7th-19th CE, Belgium)

Charcoal production has long shaped forest composition and structure. However, most studies focus on the impact of past charcoalproduction in mountain regions of Western Europe dating to the post-1650 CE period. Therefore, its influence on lowland forests (pre-1650 CE) remains largely underexplored. This study demonstrates the impact of past charcoal production activities on the Sonian Forest (Belgium). Through the integration of LiDAR data, anthracological and radiocarbon analyses, and multivariate analysis, this study reconstructs how charcoal production shaped woodland dynamics in the Sonian Forest between the 7th and 19th century CE. The results, based on the analysis of 60 charcoal kilns, show a marked shift from beech or oak-dominated pit kilns (650–1300 CE) to more taxonomically diverse mound kilns after 1300 CE, reflecting intensified resource needs and changing forest management. These findings challenge the notion of the Sonian Forest as a “pristine” ecosystem and instead highlight the longterm entanglement of culture and forests. Moreover, they demonstrate the role of past land use in shaping present-day landscapesby examining how material traces, such as archaeological remainsof charcoal production sites, reveal these intertwined ecologicaland cultural histories. Understanding these histories is important for both contemporary woodland conservation and landscape heritage management.

14:20 *Anette Sand-Eriksen, Mette Løvschal and Michelle Farrell*
A Forested Form of Life: Southeast Norway in 2350–500 BCE

Although rarely receiving much attention, large parts of Scandinavia were forested in the Bronze Age (1700-500 BCE), with people living their lives deeply entangled in forests. The character and significance of forest niches and -livelihoods are, however, almost complete overlooked in Scandinavian Bronze Age archaeology where research has historically prioritized a focus on open lands, deforestation processes and agrarian and pastoral expansion. In this paper, we want to challenge this relatively one-sided focus by exploring on the social and botanical persistence in one of these forest regions: southeast Norway - which maintained extensive forest cover throughout the Late Neolithic and into the earliest Bronze Age, before seeing a general decrease in the woodland cover towards the latter part of the period.

We use REVEALS modelling to reconstruct past vegetation, identifying a series of more-than-human moderated forest types and their persistence to the Bronze Age societies. By integrating these reconstructions with extensive archaeological data, we use affordance and niche construction theory to reconsider these forests as actively manipulated and long-term sustained environments. This approach shifts the focus from deforestation to coexistence, offering crucial insights into past human-environment interactions in the Scandinavian Bronze Age.

14:40 *Pieter Rodts*
Feral Archives: floral legacies of past woodland use in the Sonian Forest (Belgium)

The past is flowering all around us. Forest landscapes preserve living traces of former human activity. The concept of feral archives is introduced to interpret how such traces persist and transform within the Anthropocene landscape. Feral archives are features that, after ceasing and beyond serving their intended human function, remain materially and ecologically active, entering new relations with human and non-human agents while retaining memories of their past use.

In the Sonian Forest (Belgium), vegetation patches and soil patternsreveal these entanglements. Wild bluebells (Hyacinthoides non-scripta) today flourish in patches corresponding to early modern grazing zones, where livestock once dispersed bluebell seeds and altered soil fertility and forest light regimes. Elsewhere, compacted soils from 20th-century horse-riding zones suppressed tree regeneration and fostered wet-soil species such as water pepper (Persicaria hydropiper) and remote sedge (Carex remota). These ecological imprints endured beyond their original infrastructures, influencing subsequent forest policy and management.

By integrating ecological observation, historical sources, and geoarchaeological perspectives, we can study how recognizing feral archives enables a deeper reading of forested landscapes as dynamic records of Anthropocene interaction and inform current approaches to woodland heritage and management.

14:00-15:40 Session 31C:
What is the future of surface survey? Rethinking new and old methods for landscape archaeology

CHAIRS: *Enrico Giorgi, Giacomo Sigismondo, Veronica Castignani, Francesca D’Ambola*
LOCATION: U5 / 01.22

14:00 *Federico Fasson, Luca Luppino, Jacopo Scoz and Letizia Fazi*
A matter of visibility: integrating drone LiDAR into field-walking survey in Vignale-Riotorto

In 2024, the University of Siena launched an archaeological field survey in Vignale–Riotorto (Tuscany), aiming to develop a holistic and diachronic understanding of the landscape, along a study area stretching from the coastal plain to the inland hills. The research focused on contextualising major archaeological features within their environmental setting, including a Roman to Early Medieval villa-mansio, a medieval castle and parish church, and an eighteenth-century to present day agricultural estate. The survey encompassed a range of land uses, from arable fields and vineyards to uncultivated areas and Mediterranean maquis, each affecting the visibility of archaeological evidence. To address this variability, the project combined traditional field-survey tools with innovative remote-sensing techniques: analysis of historical cartography and aerial photographs, low-resolution LiDAR data, visibility calibration of artifact surface survey data, and droneborne LiDAR, the latter in collaboration with the CHAIRS of Landscape Archaeology at Roma Tre University. The paper evaluates how these methods, individually or combined, contribute to highlighting archaeological traces in relation to current landscape conditions. Particular attention is given to droneborne LiDAR, focusing on the data processing techniques used to enhance anomaly visibility, revealing alignments and features undetectable by optical sensors or inaccessible within the dense Mediterranean maquis.

14:20 *Elie Essa Kas Hanna and Antonina Arena*
From Ground to Cloud: Methodological Innovation in the Landscape Archaeology of Tenuta Manca di Geracello - Sicily

Landscape archaeology, through archaeological prospections, aims to reconstruct the landscapes of the past diachronically, starting from the remains that emerge from the surface. This approach has undergone significant methodological evolution over the last two decades with the arrival of new apps. Nevertheless, traditional methods, such as direct and systematic observation of the terrain, remain fundamental for mapping surface finds, offering an irreplaceable contextual understanding. In this context, in the summer of 2025, the first intensive archaeological surveys were launched at Tenuta Manca di Geracello in Sicily with private funding and in collaboration between the Superintendence for Cultural and Environmental Heritage of Enna and the Pontifical Oriental Institute. The approach combines traditional methods (GPS, satellite imagery, grid collection) with new applications (AI, photogrammetry, statistic and probabilistic Qgis plugins). This presentation aims to introduce this unprecedented case study and the results achieved in terms of methodology and organization, with an emphasis on its scientific impact. The aim is to demonstrate that these tools facilitate the creation of high-resolution digital terrain models and the virtual reconstruction of ancient structures and environments, improving the interpretation and communication of results to a wider audience.

14:40 *Federica Boschi, Ilaria Latini and Enrico Zampieri*
Field-walking and remote sensing for the preservation of buried archaeological heritage: the SEARCH Project (Marche, Italy).

Field-walking surveys have long been essential to reconstructing ancient settlement patterns and understanding the diachronic evolution of landscapes: this is especially true for the Marche region (central Italy) where reiterated deep ploughings and modern land use dynamics have increasingly affected the buried archaeological record and its surface legibility. In this context, the SEARCH Project – SEnsing ARCHaeology – explores the potential of traditional field-walking surveys to yield meaningful data both in extensive landscape investigations across the Corinaldo area and in targeted surveys of pre-Roman funerary sites between the Misa and Nevola River valleys. The project combines systematic field-walking with aerial photography, geophysical prospection, and the analysis of multiple historical imagery datasets. The contribution will present case studies proving how these combined approaches enhance both the quality and comparability of data within a rapidly changing rural environment. This integrated approach, compared with the invaluable dataset inherited from the long-standing tradition of field-walking surveys in this region, allows for the registration and monitoring of archaeological sites affected by modern agricultural practices, contributing to their conservation and the protection of the buried archaeological heritage.

15:00 *Jacopo Turchetto, Paola Zanovello, Andrea Meleri, Giacomo Moro and Carmen Di Fulvio*
Seeing through the sands: Remote sensing and field survey in Roman Numidia

Since 2023, the University of Padova (Italy) has been conducting systematic archaeological survey in the transitional zone between the Aurès Mountains and the Ziban region (north-eastern Algeria), an area corresponding to the southern fringes of Roman Numidia. This semi-arid landscape poses significant logistical and methodological challenges, yet it offers a unique opportunity to test the integration of remote sensing technologies and traditional field survey. Indeed, the project combines the analysis of a broad spectrum of imagery—ranging from modern multispectral satellite data to declassified historical imagery and aerial photographs—with extensive ground-truthing activities. The latter have proven essential to verify remotely detected features, evaluate their preservation, and collect diagnostic surface materials for chronological and functional assessment. This contribution aims at presenting both the methodological framework and some emblematic case studies which illustrate how the synergy between remote sensing and field observation remains indispensable for a more accurate understanding of the historical development of that landscape. Moreover, in such marginal and dynamic environments, where traces of human occupation are often subtle and discontinuous, this integrated approach encourages a renewed critical reflection on the role and potential of field-walking surveys, which should continue to stand at the heart of our archaeological and topographical investigations.

15:20 *Jorge Rouco Collazo, Denise Lima E Silva, Marta del Mastro Ochoa, Manuel Antonio Franco Fernández, Andrés Menéndez Blanco, Vega Arribas Greciano, José Javier Carreño Soler, Alexander Kabelindde, José María Moreno Narganes, Hesham Nasr, Agustín Sánchez García, Yolanda Ferro, Mikel Herrán, David Govantes-Edwards and José Cristóbal Carvajal López*
Wandering through the desert. Multiscalar approach to archaeological survey in AlUla (Saudi Arabia)

This paper presents the methodology and first results of the archaeological survey conducted over 3,000 km² in the desert south of AlUla (Medina Province, Saudi Arabia), initiated in 2025. AlUla is a historic oasis inhabited since the Bronze Age and an obligatory stop for the caravans that crossed the Arabian Peninsula along the incense route. The survey forms one branch of the AlUla Pilgrimage Routes project, carried out by INCIPIT-CSIC with funding from the Royal Commission for AlUla. The project's main goal is the archaeological study of the pilgrimage route to Mecca—the Hajj—from its origins up to the early 20th century, when the Ottoman Empire built the Hejaz Railway between Damascus and Medina. The aim of the survey is to conduct a diachronic study of the landscape and its human occupation, as well as the transit routes that predate and postdate the establishment of the Hajj route. To achieve this, a multiscale methodology is applied, ranging from satellite imagery and historical photography to surface survey. The initial results have provided valuable methodological and theoretical insights for the ongoing debate on the usefulness of surface survey—its drawbacks and advantages—in a context of increasingly widespread access to new remote sensing technologies.

15:40-16:10 **Coffee Break**

16:10-17:30 Session 18D:
Tracing back historical land-use and its legacies: common insights and perspectives of landscape archaeology and historical landscape ecology

CHAIRS: *Sjoerd Kluiving, Rebekka Dossche, Nik Petek-Sargeant, Valentina Pescini, Anneli Ekblom, Paul Lane, Giovanna Pezzi, Bennie Shen, Marianna Biró, Matthew Davies*
LOCATION: KR12 / 02.18

Damien Ertlen, Alexander Bonhage, Emma Borg, Eileen Eckmeier, Pierre Alexis Herrault, Benjamin Keller, Eileen Kerhouant, Nathanael Le Voguer, Juraj Lieskovský, Anna Schneider, Barbora Strouhalova, Natalia Hurajtova Natalia and Agnieszka Latocha-Wites
Former field systems across temperate Europe: a review

Reconstructing the history of land use, and thereby assessing the ecological legacies associated with past practices, is a key prerequisite for effective environmental governance (Ellis, 2021). Former agricultural landforms—often organized within former field systems (FFS)—are widely preserved across Europe. Among the most common micro-topographies described in the literature are lynchets, terraces, ridge-and-furrow systems, stone walls, and headland ridges. After pioneering studies by geographers in the mid-twentieth century, this topic experienced a major revival with the advent of LiDAR technology and the expansion of geoarchaeological surveys. On the one hand, LiDAR has enabled numerous regional studies on landscape history and heritage, including vast areas now covered by forest. On the other hand, geoarchaeological surveys have provided an initial, though still incomplete, chronological framework. This is why we argue for the need to adopt a broader-scale approach to better understand the history and legacy of these agricultural landscapes, as they constitute valuable evidence of cultural heritage and bear witness to former land use. To this end, we propose a literature review focusing on terminology, landscape history, and ecological legacy Ellis, E. C., 2021. Annual Review of Environment and Resources, 46, 1, 1-33

Pieter-Jan Reynaert, Seb Verlinden, Maïka De Keyzer and Bart Vanmontfort
Traces of transformation: the legacy of eighteenth-century reclamation and drainage in the Campine area (Belgium)

The Campine area in northeastern Flanders (Belgium) was profoundly reshaped by eighteenth-century reclamation and drainage projects. Once characterised by a patchwork of heathlands and wetlands in the Late Middle Ages, the region gradually evolved into a landscape dominated by agricultural fields and forests. The driving force behind this transformation was a reclamation decree issued in the second half of the eighteenth century. To the central authorities, these barren lands were considered nothing more than 'wastelands' that had to be made productive. However, the direct conversion of heathland into farmland often proved too difficult. As a result vast areas were afforested, typically with pine trees planted on raised beds divided by ditches ('rabatten'). In the few cases where common heathlands were privatised and directly reclaimed, the enclosure of the land went hand in hand with systematic drainage. The eighteenth-century reclamation ideals and interventions have left a lasting imprint on today's landscape. The dense network of ditches, still visible along field margins and within forests, testifies to a long legacy of human attempts to regulate water and redefine land use. Today, however, this historic drainage infrastructure presents new challenges under changing climatic conditions and increasingly frequent periods of drought.

William Ward, Leif Isaksen and Zeyu Fu
A Machine-Assisted Pipeline for Vectorising Land Cover in Pre-Geodetic Map Series

Deep learning is increasingly automating the processing of historical maps, with models capable of efficiently segmenting standardised surveys. However, less effort has focused on 1) applying these methods to more challenging older maps lacking coordinate systems, cartographic standardisation, and good preservation, and 2) comparing the efficiency gains of ML-assisted vectorisation in pipelines that comprehensively convert map sheets into datasets. This research trains U-net-based convolutional neural networks to automatically vectorise the local scale, pre-geodetic Tithe map series of England and Wales (1830s-1840s) to determine if processing time can be saved and if the integrity of the resulting data compares to traditional manual annotation. The cartographic style, accuracy, preservation, scale, and extent of these tax-based land surveys varies across space providing a challenging test case for the generalisability of automated approaches. Using minimal training data, models were trained to vectorise land use, boundaries, text, and parcel indexing. Compared to manual annotation, training on several map sheets was enough to provide useful machine assistance, yet manual intervention is still needed throughout for a quality dataset. The results help define the state of automation for non-uniform, cadastral-stye historic maps, and defines a machine-assisted methodology for integration with later institutional series for spatiotemporal landscape studies.

16:10-17:30 Session 24B:
Diachronic Change, Communal Agency and shifting Power Relations in Rural Landscapes

CHAIRS: *Luigi Pinchetti and Valerie Palmowski*
LOCATION: U5 / 01.17

16:10 *Santiago Tuñas-Corzón*
The social structure of Iron Age hillforts in north-western Iberia: Egalitarian, heterarchical and hierarchical relations during the first millennium BC

For a long time, it was assumed that societies in the European Iron Age were inevitably hierarchical and militaristic. This situation persisted until the 1990s, when several authors began to question the hierarchical nature of some Iron Age societies, proposing alternative interpretations of egalitarian rural communities. Crumley's concept of heterarchy, in particular, has been highly influential in showing that egalitarian and hierarchical elements can coexist and be expressed in multiple ways. But following the persistent evolutionary trends in archaeological thought, these challenging views have been strongly criticised and largely ignored until recently. Iron Age studies in NW Iberia have also produced an intense debate about social complexity. This paper presents the results of the first extensive spatial analysis of Galician hillforts. Based on this data, it is argued that Iron Age societies in NW Iberia defined an agrarian, segmented landscape with egalitarian social relations throughout most of the first millennium BC. However, from the 2nd century BC onwards, Roman influence dismantled this segmentary organisation, fostering increasing hierarchisation and coalescent dynamics. This occurred in specific subregions and in a heterarchical way, maintaining an egalitarian ethos until the end of the conquest, when the region entered the hierarchical structure of the Principate.

16:30 *Andrea Conte*
Power in Elevation: Spatial Hierarchies and Heterarchy in Central Italy's Mountain Landscapes

The concept of topographic dominance offers an alternative perspective for interpreting power relations within the landscape. Dominance doesn't derive from what is seen, but from how a site occupies and defines the space around it, asserting a condition of — physical and symbolic — control over the territory. Applied to the framework of settlement transformations between the Early Bronze Age and the Early Iron Age in Central Italy, this approach allows hierarchy to be read not as a rigid structure, but as the result of dynamic relationships between communities. During the Late Bronze Age (1350-950 BCE), the progressive shift of settlements toward mountainous areas reflects the search for new forms of territorial control and the redefinition of power relations in space. The use of the Composite Dominance Index (CDI) makes it possible to quantify this spatial condition and to highlight how the emergence of new settlement poles reflects a redefinition of community identities. Through the combination of spatial analyses, the use of remote sensing to identify fortifications, predictive modelling, and theoretical reflections on heterarchy, the paper proposes an interpretation of the protohistoric landscape as a multi-level system in which forms of power are expressed in space rather than in structures.

16:50 *Victoria Quesada Valero*
All the roads lead to Ilici: analysing the mobility and occupation of the Bajo Vinalopó in the Late Antiquity.

The interrelation between individuals and their habitat has been key to understanding societies in all their forms. How and where we live has provided, throughout history, different ways of development and growth that we have adapted to our collective needs. For this reason, understanding this dynamic is crucial for reconstructing past societies. Landscape archaeology seeks to address questions arising from territorial issues, using this discipline as the main framework for the present research. This study aims to shed light on the suburban and rural territory of Ilici by analysing the roles these areas played in Late Antiquity, from the Roman occupation to the Early Middle Ages. To achieve this, Geographical Information Systems (GIS) have been employed to examine territorial transformations through occupation dynamics and mobility analysis (MADO). Contributing new pieces to this complex puzzle allows us to approach a more comprehensive understanding of what the Bajo Vinalopó region may have looked like during this period.

17:10 *Marta Torres*
Settlement dynamics and changing landscapes during antiquity and the early Middle Ages in the southeastern peninsula: The territory of Ilunum/Eio

Cities usually play a key role in the organization of a territory. Not only as the political, administrative, economic, and religious center, but rural settlements are also often organized from them. But what happens when a city disappears at an early stage? This is the case of the territory of the Roman city of Ilunum (Hellín, Albacete), where the city disappeared in the II century BC, apparently leaving a leaderless territory until the founding of the Visigothic episcopal see of Eio in the VII century BC. The role of administrative centers was taken over by secondary sites and local elites, who were responsible for organizing and administering the territory and population during the III and VI centuries. In this communication we will explore how the landscape was organized, which were the "nuclear" sites who had the administrative power and how this changed during the centuries.

16:10-17:30 Session 10D:
Modelling demography through archaeological data: from theoretical approaches to global case studies

CHAIRS: *Michele Abballe, Francesca Chelazzi, Alessio Palmisano, Dan Lawrence*
LOCATION: U5 / 02.17

16:10 *Laura van der Knaap, Philip Verhagen and Mark Groenhuijzen*
Connecting demographic agent-based models to skeletal data: the case of the Roman cemetery at Tiel-Passewaaij

Cemetery populations offer valuable insight into living populations, but undeniably, are "sampled at one particular time: at death" (Boldsen, Milner, and Ousley 2022, 121). To deal with this, paleodemographers have employed various methods, including modelling approaches. However, most models in paleodemography are deterministic and assume population stationarity or stability; this latter assumption, though unrealistic, ensures tractability. An alternative, Agent-based modelling (ABM) is a popular bottom-up simulation method in archaeology, but it is only scarcely applied to cemetery data. ABM is stochastic and does not suffer from problems of tractability. In addition, it can examine the impact of varied social and environmental processes on the formation of the cemetery record. This study combines skeletal data, ABM, and other site data to gain insight into the (rural) population of the Roman limes. The used model was previously applied by Verhagen and colleagues (2019; 2016), but no comparison with the archaeological record was made. Simulated age-at-death distributions are compared with empirical data from the Tiel-Passewaaij cemetery. This enables us to judge the relative plausability of each simulation scenario, showing the potential of combining ABM, skeletal and settlement data to examine the stochastic (demographic and social) processes underlying the cemetery record.

16:30 *Senne Cambré, Gert Verstraeten, Marleen van Zon, Renske Hoevers and Hanne De Brue*
A probabilistic approach to estimate past population sizes combining quantitative geomorphological, palynological, and archaeological data

Palaeodemographic assessments often employ empirical-inductive methods, linking observed spatiotemporal patterns of archaeological sites or artifacts to environmental and/or cultural factors. However, such archaeological records are often biased. Here, we present an alternative approach whereby theoretical scenarios of settlement densities and population estimates are compared to pollen-based land cover reconstructions, field-based sediment budgets, and archaeological site counts and distributions. First, logistic regression modelling is applied to construct multiple scenarios of intensities and spatial patterns in land use taking into account properties of the physical environment for a range of population sizes and land use per capita scenarios. These hypothetical land-use maps are compared to REVEALS-based land cover quantifications per 500-year time slice, and they are used as input into a spatially distributed soil erosion and sediment delivery model, the outputs of which are compared to data on floodplain sediment storage. Next, per time slice, only those land use maps that match the sediment and pollen data are retained. This results in subsets of plausible settlement and population densities which are further reduced when compared by matching them to the archaeological dataset. From this probabilistic approach, a range of settlement densities and population estimates per 500-year time slice can be deduced.

16:50 *Sophie C. Schmidt and Martin Hinz*
Towards Transparent Demographic Modelling: Accounting for Bias and Uncertainty in Archaeological Data

The ERC ESTER project (ESTimation of the prehistoric population of Eurasia based on a large number of Records) aims to produce regionalised reconstructions of prehistoric demography across Europe and Western Asia using a multi-proxy Bayesian framework. By combining archaeological and environmental indicators, such as radiocarbon intensities, aoristic site sums, dendrochronological evidence, and land-use proxies, ESTER seeks to bridge the gap between local settlement studies and continental-scale syntheses.

Yet the reliability of such reconstructions depends critically on how data biases and uncertainties are recognised and integrated. Preservation conditions, research histories, and chronological precision vary substantially between regions and proxies, but these differences are rarely documented or modelled in a consistent manner. Without addressing them explicitly, comparative demographic inferences risk being misleading or non-reproducible. ESTER therefore develops a systematic framework to identify, describe, and incorporate these sources of uncertainty into regional demographic models, to make proxy selection and weighting transparent, enabling more comparable and reproducible estimates of population change. The talk will present first implementations that are currently being explored in selected case studies. They will illustrate how a structured consideration of bias can advance both the theoretical and methodological foundations of landscape-scale archaeodemography.

17:10 *Michele Abballe, Francesca Chelazzi, Alessio Palmisano and Dan Lawrence*
Discussion

16:10-17:30 Session 14D:
Re-discovering Mountainscapes: An Interdisciplinary Approach to Mountainous Areas

CHAIRS: *José Abellán Santisteban and Ylenia Paciotti*
LOCATION: U5 / 01.18

16:10 *Robin Veyron, Brigitte Talon, Juliette Knockaert, Vincent Dumas, Stéfan Tzortzis and Florence Mocci*
Reconstructing land-use history through an interdisciplinary approach: the case of the Lauvitel Integral Reserve (Écrins National Park, France)

The Lauvitel Integral Reserve (Le Bourg d'Oisans, France), created in 1995 and ranging from 1538 to 3169 m altitude, is thought as an open-air laboratory protected from human activity. Our cross-disciplinary approach aims to understand how past human activities have contributed to shaping the current alpine landscape. We thus combine archaeology, history, bioarchaeology and environmental sciences: anthracology, zooarchaeology, geomorphology and palynology. Here, we present the results of the anthracological study conducted on two archaeological sites (RILAUV.01-rock shelter and RILAUV.02-, pastoral hut, alt. 1570 m) excavated in the Reserve. These settlements are occupied between prehistory and the middle of the 19th century. A 13th century occupation layer coincides with significant deforestation as evidenced by pollens in sediment cores extracted from Lake Lauvitel in 2011. Instead, anthracological data suggest a mosaic of landscapes (predominantly forested but also including pre-forested, riparian, and steep areas) similar to the present-day environment. However, by the 17th century, the crossing of anthracological (abundance of pre-forested charcoal species) and historical archives (forest exploitation) data suggests that human activities had profoundly transformed the landscape. These results emphasize the complexity of long-term human–environment interactions and demonstrate the relevance of cross-disciplinary approaches to understanding socio-ecological dynamics in alpine landscapes.

16:30 *Ingrid Sarlöv Herlin*
An Interdisciplinary Approach to Understanding and Safeguarding Reindeer Herding in the Mountainous Regions of Northern Sweden

Reindeer herding, practised by the Indigenous Sámi, involves long-distance migrations and seasonal movements across the mountainous landscapes of northern Sweden (Sápmi) and to the coast. This livelihood is increasingly threatened by cumulative landscape pressures, including climate change and, notably, the impacts of extractive industries. These pressures fragment pastures, disrupt migration routes, and place growing strain on herds and herders. This paper explores how an integrated landscape perspective—bridging disciplinary boundaries—can foster more holistic and equitable responses to such challenges. Viewing the landscape as a living cultural entity shaped through long-term human–animal–environment relations reveal the depth and continuity of Sámi land use, expressed through sacred sites, ecological knowledge, and archaeological traces. Conventional environmental assessments often fail to capture these cumulative and temporally deep effects. A landscape-centred framework instead situates planning and decision-making within culturally grounded approaches that respect Indigenous knowledge systems and heritage values. Drawing on ongoing interdisciplinary research on mining and reindeer husbandry, the paper examines how participatory and strategic spatial planning can help mitigate land-use conflicts, enhance legitimacy and sustainability in governance, and support the resilience of Sámi reindeer herding as a vital expression of place-based knowledge amid accelerating environmental and social change.

16:50 *Oguz Kemal Basar*
Tracing the Hemshin Mountainscapes: An Interdisciplinary Archaeological Study of High-Altitude Pastoralism in the Verçenik Valley, Turkey

This paper presents a landscape archaeological investigation of the Verçenik Valley in the Kaçkar Mountains, northeastern Turkey, focusing on the little-known heritage of Hemshin shepherds who practiced high-altitude transhumance for centuries. Above 2,500 meters, these pastoralists established a network of dry-stone pens, paths, and small huts (pags) distributed across alpine pastures and glacial basins. Integrating drone-based survey, NDVI analysis, and GIS mapping, the study documents and spatially analyzes the remains of these features to reconstruct patterns of mobility, settlement hierarchy, and ecological adaptation within a high-mountain environment. The interdisciplinary approach allows for the identification of site clusters and resource-use strategies that structured the pastoral landscape. Although transhumance in the region has nearly disappeared, the spatial configuration of pens and collapsed pags preserves vital evidence of past herding intensity and environmental knowledge. Framed within broader debates in mountain archaeology and pastoral heritage, the study highlights the Verçenik Valley as a rare and fragile record of human–environment interaction in the eastern Black Sea highlands, offering new insights into how mountain communities shaped, and were shaped by, their extreme environments.

16:10-17:30 Session 15D:
Terraced landscapes as longterm socio-ecological archives

CHAIRS: *Ralf Vandam, Soetkin Vervust, Axel Cerón González, Antony Brown*
LOCATION: U2 / 01.33

16:10 *Ben Pears, Sam Hudson, Andreas Lang, Inger Greve Alsos, Dan Fallu, Kristof Van Oost, Pengzhi Zhao, Kevin Walsh and Tony Brown*
The geoarchaeology and palaeoagronomy of chalkland lynchets in eastern Belgium using sedaDNA. Implications for understanding late Holocene anthropogenic colluviation.

Landscape stability and erosion within headwater carbonate locations (particularly chalk) have traditionally received less attention than other areas of fluvial systems due to the predominance of clastic-dominated valley fills. However, the loessic (windblown) nature of these deposits enables the novel combination of Optically Stimulated Luminescence (OSL) dating, sedaDNA and sedimentology to improve our understanding of the interaction between geomorphology, ecology and agrarianism across these landscapes. This paper examines potential anthropogenic drivers of slope-sediment transfer within a dry valley with agricultural lynchets at Sint Martens-Voeren, eastern Belgium and its sustainability. The results demonstrate that cultivation occurred from the Bronze Age (1900–700 BCE), with lynchet formation on the steepest valley sides from later prehistory (Iron Age 700–50 BCE). Major erosion and sedimentation began in the early medieval period (450–1000 CE) and accelerated from the medieval period (1000–1750 CE) under an intensification of arable cultivation and soil management, development of the open three-field-system, landscape connectivity and increased climatic variability. This pattern of late Holocene slope-sediment erosion, transfer and storage mirrors other valley locations in the Voer catchment, especially in relation to lynchets, and accelerations in sedimentation in other eastern Belgian fluvial catchments, driven by high-intensity but sustainable palaeoagronomic systems.

16:30 *Christian Mader and Julia Meister*
Agricultural Terrace-Settlement Systems: A Geoarchaeological Perspective from the Southern Peruvian Andes

This paper presents an integrative geoarchaeological approach to reconstructing ancient terrace agricultural systems in the southern Peruvian Andes, focusing on the Lucanas province. Combining archaeological, geomorphological, and pedological data with remote sensing, drone surveys, and GIS-based mapping, the study examines 22 pre-Hispanic terrace complexes ranging from 1,200 to 3,800 m asl. High-resolution digital elevation models and soil analyses (grain size, geochemistry, nutrient balance, and phytoliths) reveal the structure, chronology, and management of terrace systems associated with settlements such as Cutamalla, Sihuilca, and Ayllapampa. Results demonstrate that terrace agriculture was a dynamic and adaptive strategy employed from the Paracas to the Inka periods (ca. 1000 BCE–1532 CE), responding to climatic variability and socio-economic change. Soils show minimal degradation despite long-term cultivation, indicating sustainable management practices such as organic manuring and limited irrigation. The integration of geomorphological and archaeological evidence highlights the strong link between land use, labor organization, and environmental constraints. By defining these complexes as agricultural terrace-settlement systems, this research contributes to understanding human-environment interactions, resilience, and dependency in the pre-Hispanic Andes and offers a model for studying mountain agricultural landscapes worldwide.

16:50 *Ralf Vandam, Soetkin Vervust, Axel Cerón González and Antony Brown*
Discussion

16:10-17:30 Session 21D:
Forests as Archives:
Interdisciplinary approaches to explore the woodland geoarchaeological record

CHAIRS: *Anna Schneider*
LOCATION: U5 / 02.22

16:10 *Erwin Meylemans, Marc De Bie, Soetkin Vervust, Ella Egberts, Ralf Vandam and Yannick De Vos*
Multi-disciplinary mapping of the archaeological landscape of Meerdaal forest (Belgium)

Airborne Laser Scanning (ALS) has become an indispensable tool for mapping archaeological landscapes in historical forest. In Flanders (Belgium), publicly available LiDAR data—progressively improving in resolution since 2004—has enabled the discovery and documentation of numerous geomorphological and historical sites. Using the 2015 ALS point cloud, processed at 0.25 m resolution, this study demonstrates its potential for detailed archaeological landscape analysis in the historical forest complex of Meerdaalwoud, with a focus on the Roman landscape. This analysis identifies several Roman burial mounds, Roman roads, as well as linear earthen banks, extraction pits, and ravines. Combined with older and recent archaeological and geomorphological survey data a large number of features can be attributed to the Roman villa landscape characteristic for the Belgian loess region. Recent OSL dating confirms that the field system of this Roman villa landscape has been preserved across extensive areas of the forest.

These high-resolution datasets not only enhance our understanding of Roman land use and infrastructure but also allow detailed assessments of preservation and recent forest management impacts. The results demonstrate the potential of fine-scale ALS data to reconstruct, evaluate, and protect buried Roman landscapes in long-forested environments.

16:30 *Tiffany Yee Ching Ma, Giacomo Vinci, Michele Secco and Alessandro Fontana*
Reconstructing Wooded Archaeological Landscape in the Isonzo Karst (NE Italy) using Remote Sensing, Field Survey, and Laboratory Analyses

This study aims to use multi-disciplinary approaches to discover new archaeological sites in Isonzo Karst, which is a wooded area covering 65 km2 in north-eastern Italy, located between the cities of Monfalcone and Gorizia. Methodologically, this study integrates the use of LiDAR, satellite images, historical maps, and the software QGIS to map out all archaeological traces in Isonzo Karst. Field surveys are carried out to verify traces and to collect surface artefacts. Additionally, mortars are sampled at selected sites and characterized using XRD, Optical Microscopy, and SEM.

This study results in the discovery of a number of new archaeological sites in Isonzo Karst. Firstly, a Quadriburgium-type Late Roman Camp from the 4-6th century CE, is discovered. Mortars sampled at this newly-discovered Roman Camp are pozzolanic-lime mortars, with ceramics and local sands as aggregates. They do not contain Portland Cement, which rules out a modern contemporary origin. Secondly, two 17th century military forts related to the Gradisca War (1615-1617), are identified. Thirdly, dry stone wall structures related to past agro-pastoral activities, including enclosed dolines, clearance cairns, agricultural terraces, and multicellular sheepfolds, are identified. Past land-use changes is discussed, by quantifying exploited areas based on their lithologies, soil types, slopes, and elevations.

16:50 *Vincent Robin, Claudia Oliveira, Anne Poszwa and Jean-Luc Dupouey*
Assessment of the legacies of historical Charcoal production on the on-going forest ecosystem state.

The historical Charcoal production (HCP) has been investigated in several woodlands in Northeastern France. Relic charcoal kilns have been inventoried according LiDAR data, and some of them have been described and sampled for anthracological analyses and radiocarbon datings. These analyses provided a framework to investigated the legacies of the HCP on the on-going forest ecosystem dynamics. LiDAR data was used to set-up sampling protocols with spots on/near relic charcoal kilns and out of any influences from relic charcoal kilns. According such spots distinction, samples have been taken to investigated differences in soil priorities and vegetation composition. Additionally, it has been assessed the legacies of the HCP on the water quality of outlet streams of small waterhead catchments. Results shown a significant legacy of the HCP on soils proprieties (increase in element content, pH increase, CEC changes, etc.), vegetation composition (change in spatial distribution, leaf element composition), and water quality. However, according on LiDAR inventories it appears that relic charcoal kilns are only a very little part of the forested surface, even considering soil storage. But prospecting the functional links between this ecosystem component might increase the range of the HCP legacies. This is a path that remains to be explored.

16:10-17:30 Session 28D: Landscape Archaeology of Riverine Environments

CHAIRS: *Markus Fuchs, Hans von Suchodoletz, Christian Tinapp*
LOCATION: U5 / 00.24

16:10 *Katja Sporn, Will Kennedy, Petros Kounouklas, Salvatore Ortisi and Dimitris Grigoropoulos*
The Kephissos Valley Project. Human-Environment Relations in an Ancient Greek Riverine Environment

The Greek-German Kephissos Valley Project (DAI Athens/ Ephorate of Antiquities of Fthiotida and Evrytania) explores a representative 'cross-section' through the Phokian Kephissos River Valley (Central Greece), which encompasses the name-giving river, dominant regional mountain ranges, and includes major sites of great historical significance. Opting at providing a better understanding of the natural and cultural landscape development of the valley, the project has combined a variety of methodologies including remote sensing approaches, surveys, building archaeology, excavations, as well as geophysical prospections and environmental investigations. This has greatly contributed to regional settlement history research and gained significant insights at important sites in the study area. The project now expands on the information gained by the vast amount of accumulated data. The aim is to carry out more extensive investigations and to research overall strategies of spatial organization within the valley through time. Multi-scalar measures (incl. intensive survey activities, selected excavations) are also necessary to gain in-depth insights into specific themes relevant to current research in ancient Phokis: the development of regional settlements and cult topographical issues. The aim of this paper is to discuss current research on human-environment interrelations in this important riverine landscape of Central Greece.

16:30 *Joris Starke, Brigitta Schütt and Fabian Becker*
Reconstructing ancient flow dynamics of Bakırçay river in the eastern lower Bakırçay plain (Bergama/Pergamon, Türkiye)

The alluvial plain of the Bakırçay river represents a key landscape and archive to understand human-environment interactions of the ancient metropolis of Pergamon (Izmir province, Türkiye). In recent decades, archaeological, geoarchaeological and sedimentological studies in the plain delivered a diverse picture of the landscape we aim to complete with results from geomorphological mapping, radiocarbon-dated alluvial sediment records, and the analysis of old maps and satellite imagery. Levees flanking Bakırçay river indicate a relatively stable pattern of the main channel. At the same time, the river's super-elevated character, coupled with the development of depression areas between coalescent alluvial fans, posed a risk for avulsions and flooding, also reflected in the distribution pattern of ancient settlements. Today landscape reflects the dominance of engineering measures on landscape functions – especially affecting fluvial processes. Along the edges of the plain sediments of alluvial fans deposited by tributaries interfinger with the sediments of the alluvial plain. Phases of increased alluvial fan progradation mainly date to the late Holocene, partly mirroring urban development and settlement activities of ancient Pergamon. Overall, the past – the pre-engineered - landscape indicates the dominance of fluvial processes and of land use and settlement activities adapted to these processes.

16:50 *Kinga Zamelska-Monczak, Andrzej Piotrowski and Paweł Sydor*
Role of waterways and gateways in the area of lower Warta and Odra rivers in the communication and trade with the Baltic Sea area in the early Middle Ages, NW Poland

In the early Middle Ages (8th to 11th century) waterways had strategic and economic importance in inter-regional and local communication. Gateways on waterways played a special role. They provided links to neighbouring river drainage basins and seas and their communities. The existed data suggest that the communities in the early Middle Ages living in the area lower Warta and Odra (Oder) rivers clearly directed their interests towards the regions immediately around the Baltic Sea, which, thanks to its long-distance water communication, formed a particularly privileged commercial and cultural area. The main objective of the study is to present significance most important gateways connecting the lower Warta and Odra with Baltic Sea in terms of their potential for communication and transport in the early medieval period. Within the study area, seven potential gateways were identified in locations strategically positioned along long-distance transport routes leading to the Baltic. Typical examples include the coastal centre of Wolin and Santok, located at the confluence of the Warta and Noteć rivers. Such nodal points connected culturally and politically diverse regions, enabling the movement and control of people and goods while fostering the emergence of gateway communities specialised in maintaining and operating these key nodal zones.

17:10 *Dor Heimberg*
„Go Downstream on the Jiang": Navigating Challenges in the Study of Riverine Mobility in Ancient China

The rivers of China, which were vital arteries in forming early states and economic networks during the first millennium BCE, often have their essential role in ancient mobility taken for granted. Consequently, concrete archaeological data on riverine mobility is limited and fragmented, resulting in very little dedicated scholarship in China, and even less research incorporating spatial methods. This presentation will outline the current knowledge of riverine mobility during the Warring States period (456-221 BCE), drawing on epigraphic materials, iconographic boat representations, and excavated vessels. Recognizing the shortcomings of these sources, this research expands the view to the riverine landscape itself, considering its topographic and hydrologic properties, alongside the spatial distribution of sites and artefacts. While models for the archaeological imprint of riverine movement on the landscape exist for European and American cases, their applicability to East Asia must be critically questioned. This research proposes a novel, locally-grounded spatial model for riverine mobility in ancient Southwestern China. This model incorporates unique local topographical, hydrological, and landscape properties, informed by historical and ethnographic parallels. Ultimately, it offers a concrete methodology for future archaeological surveys and introduces this crucial Chinese case study to the broader global scholarship on ancient river landscapes.

16:10-17:30 Session 31D: What is the future of surface survey? Rethinking new and old methods for landscape archaeology

CHAIRS: *Enrico Giorgi, Giacomo Sigismondo, Veronica Castignani, Francesca D'Ambola*
LOCATION: U5 / 01.22

16:10 *Marco Cavalazzi*
Pedestrian Survey in Geomorphologically Dynamic Alluvial Floodplains: Limits, Methods, and Opportunities

In recent decades, artefact or pedestrian survey has undergone substantial re-evaluation across different archaeological traditions. In the British, American and Mediterranean contexts, diverse methodological developments have sought to address its well-known limitations, yet surface survey remains widely employed, most often as a preliminary tool for landscape investigation. These limitations are particularly evident in alluvial floodplains, where geomorphological processes—especially alluvial sedimentation—reduce site visibility and often lead to the perception of such landscapes as poorly suited to archaeological research.
This paper reassesses the potential of surface survey in highly dynamic alluvial settings, focusing on the Ravenna region (northern Italy). It argues that, when supported by locally adapted sampling strategies and multidisciplinary approaches, these landscapes can yield data of historical and archaeological significance. Despite their frequent characterisation as wetlands or marginal zones, floodplains have often held central socio-economic roles as spaces of reclamation, resource management, and infrastructural investment. At the same time, their ecological fragility makes them particularly sensitive to crises and environmental change. Precisely because of this instability, alluvial landscapes can reflect systemic transformations earlier and more clearly than more stable environments, making them valuable areas for archaeological research.

16:30 *Eva Cott, Christoph Keller, Michael Schneider and Luise Lorenz*
Those declared dead live longer – field surveys as an active component of the prospective methodological canon in Rhenish archaeology

From the 1950s onwards, field surveys became established as a standard method in Rhenish archaeological heritage management.This method first came to prominence in the 1970s during a research project in the lignite opencast mining area and in the field of official lignite-archaeology, which was also becoming established at that time. The fieldsurveys provided evidence of the diachronic development of large landscape sections. These findings often formed the starting point for subsequent investigations. The further development of the method received another boost in the 1990s through fieldsurveys in various Rhenish landscape, from the Lower Rhine to the low mountain range. Of these 6 km² study areas, one, the 'Rheinbacher Lössplatte' was finally evaluated and published. To this day, the procedure established there forms the methodological basis for the numerous fieldsurveys that are still being carried out in the Rhineland. In terms of planning, an average of 150 hectares of agricultural land are surveyed annually by the survey-department alone, supplemented by numerous measures carried out by archaeological consultants. Field surveys remain a lively, reliable and cost-effective method of archaeological research. Due to known phenomena that can obscure surface findings, these results are usually corroborated using further methods.

16:50 *Enrico Giorgi*
Final discussion

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20:00-02:00

LAC PARTY

with

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EARTH FIND & WIRE

Northern Franconian Alb

The full-day excursion takes you to the Northern Franconian Alb, a low mountain range region with numerous prehistoric to medieval monuments and intensive settlement and habitation since the Mesolithic period.

Places visited will include:

- the fortified hilltop settlement (late Celtic oppidum) on the **Staffelberg** near Bad Staffelstein with a tour of the acropolis and reconstructed post-slot wall, as well as the Zangentor gate, which was archaeologically investigated and reconstructed a few years ago
- the prehistoric ritual site **'Hohler Stein'** near Schwabthal on an imposing Jurassic rock formation
- the '**Görauer Anger'**, which was used as a settlement and burial site for many centuries
- the **Aufseß River**, an intensively investigated river catchment to reconstruct human induced landscape change since the Neolithic period
- the **Jungfernhöhle** cave near Tiefenellern, known worldwide as a site for deposition of human individuals from the Mesolithic and Neolithic periods

The excursion is limited to 45 participants.

Departure will be on Saturday, 21 March 2026, at 8:00 a.m. from Markusplatz in Bamberg, with return arrival at approximately 6:00 p.m. at the same location.

Schedule for the Northern Franconian Alb excursion:

08:00	Departure from Bamberg Markusplatz
08:40	Staffelberg (max. 2.5 hours, ascent via Zangentor, return via Wall Vorburg to the Romanstal car park, departure towards Hohler Stein 11:10)
11:30	Hohler Stein (max. 45 min., departure towards Görauer Anger 12:15)
12:55	Görauer Anger (max. 2 hours, departure towards Voitmannsdorf/Aufseß 14:55)
15:30	Voitmannsdorf/Aufseß (max. 45 mins, departure towards Jungfernhöhle 16:15)
16:30	Jungfernhöhle (max. 45 mins, departure towards Markusplatz Bamberg 17:15)
18:00	Arrival at Bamberg Markusplatz

The Limes in Franconia

This full-day excursion takes you to different sites along Upper German-Raetian Limes, part of the UNESCO-World Heritage "frontiers of the Roman Empire". The Limes is by far the largest archaeological monument in Central Europe and has shaped the landscape for centuries.

Places visited will include:

- The Archaeological Museum and the Roman fort of **Weißenburg**, which showcases findings from the fort and settlement of Abusina/Weißenburg as well as important objects from different sites along the frontier.
- The "**Hesselberg**" mountain was not directly included in the line of Roman fortifications. Yet the important landmark makes an impression on the limes, as its otherwise straight line makes a bend here in order to encompass it.
- At the Archaeological Park of **Ruffenhofen** a Roman Auxiliary fort is made visible by use of vegetation. The museum is an example of a successful interplay between building and landscape.
- Traces of the limes and its fort, including the remains of a small wooden amphitheatre hidden in the forest can be found at **Dambach**

The excursion is limited to 45 participants.

Departure will be on Saturday, 21 March 2026, at 8:00 a.m. from Markusplatz in Bamberg, with return arrival at approximately 6:00 p.m. at the same location.

Bavarian Bohemian History Park and the German-Czech Border

This full-day excursion will take participants to Bärnau, a small town located 1 km west of the Bavarian-Bohemian border, east of Bamberg. From here the border landscape can be explored on foot.

The mountain range of the Oberpfälzer Wald has historically served as a natural barrier and political border.

Settlement history of the region shows evidence dating back to the Slavic period. During the Middle Ages, the so-called Golden Road facilitated cultural exchanges across the border, connecting the cities of Nuremberg and Prague. Traditional cultural contacts were significantly disrupted over the course of the 20th century due to the National Socialist regime and were rigorously interrupted by the establishment of the Iron Curtain. Today, archaeological projects and voluntary initiatives by residents on both sides of the border are revitalizing historical relations through bilateral initiatives across the border.

Bärnau is not only a site for research into a fascinating border landscape, but it is also home to the History Park and the ArchaeoCentrum Bavaria-Bohemia, where experimental archaeology is conducted alongside research into medieval construction techniques and the reconstruction of the medieval way of life in a border region, supported by evidence-based environmental reconstruction.

Places to be visited include:

A guided tour in the History Park Bärnau/Tachov:

- reconstructions of medieval housing, a wooden church, and a motte-and-bailey castle
- an experimental long-term construction site of a medieval royal travel courtyard
- applied archaeology: modern holiday lodges inspired by experimental archaeology

A guided trail along both sides of the German-Czech border (3 hours):

- Relics of the former Golden Road
- Tilly's Reduit from the Thirty Years' War
- Relics of National Socialist fortifications and the Iron Curtain
- The abandoned village of Paulusbrunn

Departure: Saturday, 21 March 2026, at 8:30 a.m. from Markusplatz in Bamberg, with a return to the same location expected at approximately 6:00 p.m.

BAMBERG City

World Heritage at second glance – an archaeological-historical walk through Bamberg's Old Town

In contrast to the numerous profane and sacred architectural monuments that make up the UNESCO World Heritage Site of Bamberg – consisting of the City on the Hills, the Island District and the Market Gardener´s District – the archaeological monuments of the old town remain largely hidden at first glance. However, the results of numerous archaeological excavations provide insights into past times and into the development and growth of the city long before its first mention in the year 902.

Bamberg's city archaeologist Dr. Stefan Pfaffenberger will let you take a closer look at this seemingly hidden part of the city's history by introducing you to selected archaeological sites. Because many things, that shape the face of the city today, have roots that go back a long way…

Anticipated Participants: The tour is limited to 30 participants and will take 3,5–4 hours.

Start and meeting point: Saturday 21 March 2026, 9:00 a.m. at Am Kranen 14 (University building KR14, courtyard)

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Live sessions during the conference will be moderated. Speakers are expected to respect the choices of the moderator in selecting questions or comments, managing session times, etc. Also, participants are required to respect the privacy of other participants and refrain from any unauthorized or unwelcomed recording or photography.

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We follow the University of Bamberg guidelines "Respecting Boundaries" in promoting a safe and healthy environment. More information can be found here: **https://www.uni-bamberg.de/en/representative-officers/equal-opportunity-officer/basics-laws/harassment-discrimination/**

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- Publication on social media channels
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- Archiving for documentation purposes

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