



12TH

INTERNATIONAL
SCIENTIFIC
CONFERENCE

METHODOLOGY & ARCHAEOLOGY

Zagreb, 28th November 2024

<https://metarh.ffzg.unizg.hr/>

1 2 3 4 5 6 7 8 9 10 11 12

IMPRESSUM

PUBLISHER

Faculty of Humanities and Social Sciences,
University of Zagreb

Ivana Lučića 3, HR-10000 Zagreb

FOR THE PUBLISHER

Domagoj Tončinić

EDITOR

Ina Miloglav

DESIGN & DTP

Srećko Škrinjarić

ISBN: 978-953-379-213-2

CONFERENCE ORGANISED BY

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
and the Croatian Archaeological Society

FINANCIAL SUPPORT

This year's conference has been financially supported by the Faculty of Humanities and Social Sciences of
the University of Zagreb and the Croatian Archaeological Society.

12TH
INTERNATIONAL
SCIENTIFIC
CONFERENCE

METHODOLOGY & ARCHAEOLOGY

Zagreb, 28th November 2024



eBook of abstracts

<https://metarh.ffzg.unizg.hr/>



Conference <i>Methodology and Archaeometry</i>	7
List of participants	9
Programme	19
Abstracts	25
Poster abstracts	37
Exhibition <i>First Settlements...</i>	43
Publications	46
Navigation & General information	49

The scientific conference *Methodology and Archaeometry* is being organised by the Department of Archaeology, Faculty of Humanities and Social Sciences since 2013. The goal of the conference is to entice interdisciplinarity, critical thinking, new insights and approaches as well as new theoretical frameworks in contemporary archaeological science.

Coverage of a wide spectrum of themes and scientific disciplines has resulted in papers and discussions that promote scientific issues in the fields of methodology, documentation and interpretation of archaeological data.

The interdisciplinary character of the conference brings together archaeologists and researchers from other scientific disciplines with whom archaeologists collaborate closely; and who – through their work, projects and ideas – promote new insights about interpretation of the human life in the past.

Section Methodology

Obtaining and collecting data is an essential part of the archaeological research process. How we collect and interpret data defines the validity of our interpretation. We use different techniques, approaches and tools which help us to reconstruct past processes and to give a more objective and comprehensive picture of the past. Contemporary interpretation tools alleviate and speed the data collection and also provide us with countless possibilities for the interpretation, protection and presentation of archaeological sites and the landscapes encompassing them.

Section Archaeometry

Having in mind the limited information we obtain from archaeological excavations and from the classification of archaeological material, cooperation with other scientific disciplines becomes necessary, to obtain as much information as possible on the conditions and the way in which humans lived in the past. Contemporary archaeology is a very heterogeneous discipline encompassing interest groups focussed on various periods, regions, theoretical frameworks and methodological techniques. Aside from the description of mechanical and physical features of a specific artefact or material, various archaeometrical analyses help us to direct our scientific focus to questions regarding the ways and features included in the social and cultural life of people who made, used, exchanged and discarded those objects. Cooperation with the natural sciences provides answers to many questions, but it also demands an additional level of caution when selecting adequate scientific analysis for a specific archaeological problem. It also demands continuous cooperation of a specific expert and an archaeologist from sample collection to the final interpretation.

BALEN JACQUELINE

Archaeological Museum in Zagreb
Nikola Šubić Zrinski Square 19, 10000 Zagreb, Croatia
jbalen@amz.hr

BAŠIĆ ANDREJ

Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture,
University of Split
Ruđera Boškovića 32, 21000 Split, Croatia
andrej@fesb.hr

BECHTOLD BABETTE

Institute of Classical Archaeology, University of Vienna
Franz-Klein-Gasse 1, 1190 Vienna, Austria
Babette.Bechtold@univie.ac.at

BELAJ JURAJ

Institute of Archaeology
Jurjevska 15, 10000 Zagreb, Croatia
jbelaj@iarh.hr

BERNARDINI FEDERICO

Università Ca' Foscari Venezia
Dorsoduro 3484/D, 30123 Venezia, Italy
federico.bernardini@unive.it

BORGERS BARBARA

Institute of Classical Archaeology, University of Vienna
Franz-Klein-Gasse 1, 1190 Vienna, Austria
barbara.borgers@univie.ac.at

BOROJEVIĆ ŠOŠTARIĆ SIBILA

Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb,
Pierottijeva 6, 10000 Zagreb, Croatia
sibila.borojevic-sostaric@rgn.unizg.hr

BRENKO TOMISLAV

Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb
Pierottijeva 6, 10000 Zagreb, Croatia
tomislav.brenko@rgn.unizg.hr

BURMAZ JOSIP

Kaducej Ltd.
Papandopulova 27, 21000 Split, Croatia
josipburmaz@yahoo.com

BUŽANIĆ DOMAGOJ

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
dbuzanic@ffzg.unizg.hr

CÁMARA SERRANO JUAN ANTONIO

Department of Prehistory and Archaeology, University of Granada
Campus of Cartuja.n/n, 18071 Granada, Spain
jacamara@ugr.es

CARIĆ MARIO

Centre for Applied Bioanthropology, Institute for Anthropological Research
Ljudevita Gaja 32, 10000 Zagreb, Croatia
mario.caric@inantro.hr

CODLIN MARIA C.

Dipartimento di Scienze della Vita e Biologia dei Sistemi, Università degli Studi di Torino
Via Accademia Albertina 13, 10123 Torino, Italy
maria.codlin@unito.it

ČOKLO MIRAN

Institute for Anthropological Research
Ljudevita Gaja 32, 10000 Zagreb, Croatia
miran.coklo@inantro.hr

DORADO ALEJOS ALBERTO

Department of Prehistory and Archaeology, Universidad de Granada
Campus of Cartuja.n/n, 18071 Granada, Spain
doradoalejos@ugr.es

DONEUS NIVES

VIAS – Vienna Institute for Archaeological Science
Franz-Klein-Gasse 1, 1190 Vienna, Austria
nives.doneus@univie.ac.at

FABIJANIĆ TOMISLAV

Department of Archaeology, University of Zadar
Obala Petra Kresimira IV. 2, 23000 Zadar, Croatia
tfabijan@unizd.hr

GASSNER VERENA

Institute of Classical Archaeology, University of Vienna
Franz-Klein-Gasse 1, 1190 Vienna, Austria
verena.gassner@univie.ac.at

GODANJ MISLAV

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
mgodanj@m.ffzg.hr

HASENZAGL CARINA

Department of Archaeology, Ghent University
Sint-Pietersnieuwstraat 35, 9000 Ghent, Belgium
Carina.Hasenzagl@UGent.be

IVAŠIĆ DEA

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
dea.2.ivasic@gmail.com

JERKOVIĆ IVAN

University Department of Forensic Sciences, University of Split
Ruđera Boškovića 33, 21000 Split, Croatia
ivanjerkovic13@gmail.com

JANEŠ ANDREJ

Croatian Conservation Institute
N. Grškovića 23, 10000 Zagreb, Croatia
ajanes@hrz.hr

JONJIĆ ANTONIJA

Centre for Applied Bioanthropology, Institute for Anthropological Research
Ljudevita Gaja 32, 10000 Zagreb, Croatia
antonija.jonjic@inantro.hr

KALAFATIĆ HRVOJE

Institute of Archaeology
Jurjevska 15, 10000 Zagreb, Croatia
hkalafatic@gmail.com

KARAVIDOVIĆ TENA

Institute of Archaeology, Zagreb
Jurjevska 15, 10000 Zagreb, Croatia
tkaravidovic@iarh.hr

KOKOTOVIĆ TEA

Institute of Archaeology
Jurjevska 15, 10000 Zagreb, Croatia
tkokotovic@iarh.hr

KOVAČEVIĆ SAŠA

Institute of Archaeology
Jurjevska 15, 10000 Zagreb, Croatia
sasa.zgb@gmail.com

KRUŽIĆ ANTONELA

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
akruzic@m.ffzg.hr

KUŠAN MARKO

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
mkusan@m.ffzg.hr

LOZINA ANTE

University Department of Forensic Sciences, University of Split
Ruđera Boškovića 33, 21000 Split, Croatia
ante.lozina@forenzika.unist.hr

MATIJEVIĆ VINKA

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
vibubic@ffzg.unizg.hr

MILOGLAV INA

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
imiloglav@ffzg.unizg.hr

NIKOLIĆ JAN

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
jnikolic@m.ffzg.hr

NICOLOSI TERESA

Department of Cultural Heritage, University of Bologna
Via degli Ariani 1, Ravenna, Italy
teresa.nicolosi2@unibo.it

NOVAK MARIO

Centre for Applied Bioanthropology, Institute for Anthropological Research
Ljudevita Gaja 32, 10000 Zagreb, Croatia
mario.novak@inantro.hr

ORTIZ DE LA GUIA LAURA

Department of Prehistory and Archaeology, Universidad de Granada
Avda. del Hospicio, s/n C. P., 18010 Granada, Spain
laura.ortiz.guia.13@gmail.com

OSTERHOLTZ ANNA J.

Department of Anthropology and Middle Eastern Cultures,
Mississippi State University, Starkville
PO Box AR, Mississippi State, MS 39762, USA
aosterholtz@anthro.msstate.edu

PINILLOS DE LA GRANJA PAULA

Department of Prehistory and Archaeology, University of Granada
Campus of Cartuja n/n, 18071 Granada, Spain
pinillosdlg@ugr.es

PREMUŽIĆ ZRINKA

Department of Ethnology and Cultural Anthropology,
Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
zpremuzi@m.ffzg.hr

SABLJAK BORNA

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
bsabljak@m.ffzg.hr

SANDEVA-MINKOVA DENITSA

National Archaeological Institute with Museum, Bulgarian Academy of Sciences
2 Saborna Str., 1000 Sofia, Bulgaria
denitsa.sandeva@abv.bg

SANDRON SARAH

Dipartimento di Scienze della Vita e Biologia dei Sistemi, Università degli Studi di Torino
Via Accademia Albertina 13, 10123 Torino, Italy
sarah.sandron@unito.it

SEKELJ IVANČAN TAJANA

Institute of Archaeology, Zagreb
Jurjevska 15, 10000 Zagreb, Croatia
tsivancan@iarh.hr

SIRONIĆ ANDREJA

Ruđer Bošković Institute
Balokovićeva 51, 10000 Zagreb, Croatia
siroandi@yahoo.com

STINGL SEBASTIJAN

Institute of Archaeology
Jurjevska 15, 10000 Zagreb, Croatia
sstingl@iarh.hr

ŠILJEG BARTUL

Institute of Archaeology
Jurjevska 15, 10000 Zagreb, Croatia
bartul.siljeg@iarh.hr

ŠOŠIĆ KLINDŽIĆ RAJNA

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
rsosic@ffzg.unizg.hr

TONČINIĆ DOMAGOJ

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
dtoncinic@ffzg.unizg.hr

TRESIĆ PAVIČIĆ DINKO

Kaducej Ltd.
Institution Address: Papandopulova 27, 21000 Split, Croatia
dtresic@gmail.com

VITEZOVIĆ SELENA

Institute of Archaeology
Kneza Mihaila 35/IV, 11000 Belgrade, Serbia
s.vitezovic@ai.ac.rs

VUJČIĆ KARLA

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000, Zagreb, Croatia
vujcickarla@gmail.com

VUKOVIĆ JASNA

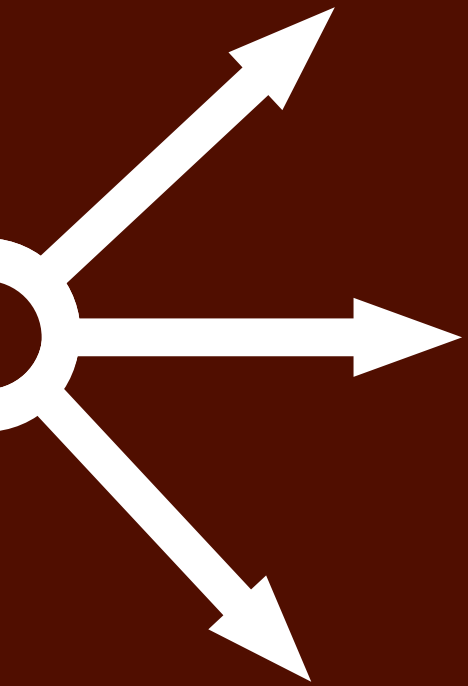
Department of Archaeology, Faculty of Philosophy, University of Belgrade
Čika-Ljubina 18-20, 11000 Belgrade, Serbia
jvukovic@f.bg.ac.rs

VUKOVIĆ MIROSLAV

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb
Ivana Lučića 3, 10000 Zagreb, Croatia
mivukovic@ffzg.unizg.hr

ZOJČESKI TOMISLAV

Ruina Ltd
Paška Zjačića 10, 22000 Šibenik, Croatia
arheo@ruina.hr



PROGRAMME

Thursday, 28th of November**9:00 – 9:15****Conference opening****Key-note lecture:****Chair: Ina Miloglav****9:15 – 9:55****Federico Bernardini***From Roman conquest to centuriation: an epochal shift in Karst landscape***10:00 – 10:30****Coffe break****Session 1****Chair: Jacqueline Balen****10:30 – 10:45****Miroslav Vuković, Domagoj Bužanić, Vinka Matijević & Domagoj Tončinić***Roški slap – a river crossing in the context of an archaeological landscape study***10:50 – 11:05****Borna Sabljak, Mislav Godanj, Jan Nikolić, Marko Kušan, Antonela Kružić, Hrvoje Kalafatić, Bartul Šiljeg & Rajna Šošić Klindžić***LiDAR data used for detection of large prehistoric earthwork structures in Eastern Croatia***11:10 – 11:25****Hrvoje Kalafatić, Rajna Šošić Klindžić & Bartul Šiljeg***Rondels and the Rise of Neolithic Urbanism: Tracing Early Planning in the Carpathian Basin***11:30 – 11:45****Andrej Janeš & Tomislav Zojčeski***Long time, no siege: non-invasive archaeological methods in the research of Cesargrad castle***11:50 – 12:10****Coffe break**

Session 2**Chair: Rajna Šošić Klindžić****12:10 – 12:25****Tena Karavidović, Tomislav Brenko, Sibila Borojević Šošćarić & Tajana Sekelj Ivančan***Topsoil geochemistry as a tool for recognizing past iron production environments – a case study of Kalinovac – Hrastova greda site***12:30 – 12:45****Tomislav Brenko, Sibila Borojević Šošćarić, Tena Karavidović & Tajana Sekelj Ivančan***Bog iron ores in Central Croatia – formation in Kupa and Sava River plains?***12:50 – 13:05****Jasna Vuković, Ina Miloglav, Jacqueline Balen & Miroslav Vuković***Smoothed and damaged: Use-wear traces on the bases of food-processing vessels from Viškovci, Eastern Slavonia***13:10 – 13:25****Selena Vitezović***Identification and interpretation of hunting and fishing gear from osseous raw materials in prehistory***13:30 – 13:45****Carina Hasenzagl, Barbara Borgers, Verena Gassner & Babette Bechtold***FACEM: A Repository for Ancient Mediterranean Ceramics***13:50 – 15:20****Lunch break****Session 3****Chair: Selena Vitezović****15:20 – 15:35****Andreja Sironić & Nives Doneus***Mortar analyses of archaeological monuments in the Mediterranean climate regions***15:40 – 15:55****Mario Novak, Mario Carić, Miran Čoklo, Antonija Jonjić & Anna J. Osterholtz***Heavy metal: the first results of environmental lead poisoning study in archaeological populations from Croatia***16:00 – 16:15****Zrinka Premužić, Mario Carić, Dea Ivašić, Teresa Nicolosi, Josip Burmaz, Dinko Tresić Pavičić & Mario Novak***Isotopes and Insights: A Pilot Study of Reconstructing the Diet and Health of Children from the Past***16:20 – 16:35****Tea Kokotović, Mario Carić, Sebastijan Stingl, Mario Novak & Juraj Belaj***Incremental dentine analysis: A case study from the Church of St. Martin at Prozorje***16:40 – 16:55****Saša Kovačević***Building the Past: The Use of Wood in Eastern Hallstatt Culture Settlements and Burials in the Podravina Region (NW Croatia)***17:00 – 17:15****Coffe break**

Session 4**Poster presentation****17:15 – 17:45****Laura Ortiz de la Guia & Alberto Dorado Alejos**

How is a mummy made? First analytical results of the construction materials associated with the sealing of tomb 121 in Castellón Alto (Galera, Spain)

Paula Pinillos de la Granja, Alberto Dorado Alejos & Juan Antonio Cámara Serrano

A technological approach to Bell Beaker pottery (2500/2450 – 2350 BC) from southeast of the Iberian Peninsula

Andrej Bašić & Ivan Jerković

Application of digitization and additive manufacturing in cultural heritage: An economic approach “More with Less”

Denitsa Sandeva-Minkova

Non-destructive methods for registration of archaeological sites and destructive investigation on the territory of the Ludogorsko Plateau, Northeastern Bulgaria

Mislav Godanj, Borna Sabljak & Karla Vujčić

Detection and analysis of new archeological sites using the methodological approach of the QField application

Maria C. Codlin, Sarah Sandron & Tomislav Fabijanić

ZooMS analysis of an eggshell from early medieval grave from Dubravice (northern Dalmatia)

Ante Lozina

Studying ancient human remains: Challenges of scientific analysis amidst cultural descendants' rights

ABSTRACTS

Federico Bernardini

Università Ca' Foscari Venezia, Italy

From Roman conquest to centuriation: an epochal shift in Karst landscape

Interdisciplinary research started approximately ten years ago, integrating advanced remote sensing technologies, geomorphology, and traditional archaeological approaches, has dramatically enhanced our understanding of the impact of Roman conquest and Romanization on the Trieste area. LiDAR-derived data, geophysical surveys, and archaeological investigations have revealed a Republican fortification system southeast of Trieste, aligned opposite Northern Istria. This system includes a primary large camp (>20 ha) on San Rocco hill, supported by two smaller structures: Grociana Piccola (approx. 2 ha), 4 km to the northeast, and Montedoro, 1.4 km to the southwest. Both San Rocco and Grociana Piccola show two principal building phases, indicating usage - though possibly intermittent - from the early 2nd century BC until the end of the Republican period. The early phases, dating to the 2nd century BC, rank among the oldest known Roman camps.

The impact of the Roman conquest is further underscored by an efficient road network, likely constructed alongside the camps and reconstructed through LiDAR data and over 500 Roman shoe hobnails. The main road, crossing the Trieste Karst and paralleling the coastline, was shaped by the orientation of limestone formations, forming a critical axis of the centuriation system that organized a vast area extending approximately from Komen and Aurisina to Sežana, Basovizza and the Rosandra river. Notably, Camp 2 at San Rocco shares the same orientation as the centuriation grid, suggesting an early date for the Karst's land division. The construction of these substantial fortifications, and especially the road and centuriation systems, imposed a previously unseen regularity over the pre-Roman territorial organization, marking an epochal shift in the landscape.

Miroslav Vuković, Domagoj Bužanić, Vinka Matijević & Domagoj Tončinić

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb, Croatia

Roški slap – a river crossing in the context of an archaeological landscape study

This paper presents the results of the archaeological study of a small part of a landscape dominated by the rivers Krka and Cetina in the Dalmatian hinterland, focusing on the river crossing at Roški slap on the river Krka. The research is a part of the project, funded by the Croatian Science Foundation, “Between war and peace. The transformation of the cultural landscape between the Krka and Cetina rivers from Prehistory to Late Antiquity” (TiHiTransForm), which aims to study if and how the need for defending and controlling territory influenced the transformation of the wider cultural landscape. At Roški slap, a natural tufa formation forms a barrier where the river creates a 25m high and 650m long waterfall and serves as an optimal river crossing in the deep gorge of the river Krka.

Our research included the analysis of aerial and satellite photographs as well as the interpretation of LiDAR data available for the area. The recognized archaeological features were surveyed and one of the sites was selected for excavation. The interpretations revealed a surprising number of new and previously undocumented sites that spanned from Prehistory to Antiquity. Although some prehistoric features and sites, like local stone mounds and the hillfort above Marasovići, were previously known, evidence of what seem to be five temporary Roman military camps escaped notice until the arrival of LiDAR data. The goal of this paper is to present the interpreted features within the context of the natural river crossing of Roški slap and to offer an explanation for the difference in site positions between the prehistoric sites and Roman sites. This data will be used to set up a new perspective on determining the process of transformation of the local cultural landscape from Prehistory to Antiquity.

Borna Sabljak¹, Mislav Godanj¹, Jan Nikolić¹, Marko Kušan¹, Antonela Kružić¹, Hrvoje Kalafatić², Bartul Šiljeg² & Rajna Šošić Klindžić¹¹Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb, Croatia²Institute of Archaeology, Zagreb, Croatia*LiDAR data used for the detection of large prehistoric earthwork structures in Eastern Croatia*

Prehistoric large earthworks present significant markings on the landscape that are present to this day. Its visibility on aerial images is widely recognized and documented. Therefore, we assumed that the remains of such large interventions should also be visible as the traces in the microtopography visible on new publicly available LiDAR data provided by the Croatian Geodetic Administration (DGU). We established a workflow in order to observe new potential sites. For visualization, we used DRM generated by the DGU, and visualizations were made using the Relief Visualization Toolbox in QGIS. As a starting point, we used previously known sites and their appearance on visualizations, based on which we observed selected areas in search for similar structures. We used different visualization parameters, which proved to be crucial for the visibility of the sites. To establish a possible chronological attribution to the prehistoric period we analyzed historical records and maps for traces of possible origin of the observed structures.

We conducted field surveys on potential sites and the surface finds confirmed their attribution to the Neolithic and Bronze Age periods. In this paper we will present our workflow, the best visualization parameters for this type of sites and sites we found and confirmed by field survey. Our future efforts will aim to detect more sites and find defining elements that could establish more precise chronological attribution of sites using remote sensing.

Hrvoje Kalafatić¹, Rajna Šošić Klindžić² & Bartul Šiljeg¹¹Institute of Archaeology, Croatia²Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb, Croatia*Rondels and the Rise of Neolithic Urbanism: Tracing Early Planning in the Carpathian Basin*

In Eastern Slavonia, a region with a rich archaeological landscape, numerous Middle and Late Neolithic sites have been uncovered through aerial reconnaissance and satellite imagery. These methods led to the identification of many sites, later confirmed by field surveys and surface finds. In the vicinity of Đakovo, Croatia, magnetic surveys conducted on several confirmed sites revealed extensive Neolithic settlements, showcasing complex spatial organization, enclosures, and early forms of urbanization. The research adopts a multidisciplinary approach, using various archaeological techniques to explore the types and chronology of rondels located on the southern fringe of the Carpathian Basin. Beyond typological analysis, standard dating techniques are employed to clarify the temporal dynamics of rondel construction and use in this region, offering insights into early urban planning.

These findings not only contribute to a deeper understanding of local archaeology but also provide broader perspectives on the diffusion of material culture and cultural interactions, enriching our knowledge of prehistoric communities in this transitional zone. The spatial complexity and cultural implications of these expansive settlements, which hint at the first instances of urban planning, challenge conventional views on settlement patterns, underlining the importance of comprehensive study and preservation efforts.

Andrej Janeš¹ & Tomislav Zojčeski¹¹Croatian Conservation Institute, Zagreb, Croatia²Ruina Ltd, Šibenik, Croatia*Long time, no siege: non-invasive archaeological methods in the research of Cesargrad castle*

The remains of the Cesargrad castle are located on a hill, on the left bank of the gorge Sutla River, overlooking the market town of Klanjec. The castle is known from historical sources from the end of the 14th century. The most famous historical event connected to it was the siege in 1573, during the Great Peasant Uprising. The archaeological research of the castle was centered around the core of the castle where the standing structures are still visible above ground. In two excavation campaigns (2008 and 2010) the western tower and the palace were partially researched. During the 2018 campaign, the analysis of the standing structures was conducted through



the application of the archaeology of standing structures. The results partially coincide with the known written documents, but also indicate an older date for the construction of the castle. The castle is composed of the inner core and of the outer ward. Most of the structures of the presumed outer ward are partially recognizable in the terrain morphology. To trace these remains in 2021 a LiDAR survey was conducted. The survey included an integrated application of LiDAR and photogrammetry by using a UAV system which collected both data simultaneously. Lidar data was later processed and classified to obtain a precise and detailed DTM of a wider area around the castle, which was then visualized and interpreted for archaeological remains. The newfound archaeological features can be interpreted as possible military installations or siege positions erected during strife. The paper will present the overall research on the Cesargrad castle, complemented with the latest data on the area of the castle and surrounding hills obtained by the LiDAR survey.

Tena Karavidović¹, Tomislav Brenko², Sibila Borojević Šoštarić² & Tajana Sekelj Ivančan¹

¹Institute of Archaeology, Zagreb, Croatia

²Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, Croatia

Topsoil geochemistry as a tool for recognizing past iron production environments – a case study of Kalinovac – Hrastova greda site

In the past several years, part of the Croatian lowland Drava River valley region has been systematically studied for traces of iron production. More than 150 sites were recognized through surface surveys and excavated workspace areas are dated to Late Antiquity and the Early Middle Ages (4/5th – 8/9th centuries). The latter sites could be referred to as iron production environments. These include workspaces with traces of past human iron production activities and adjoining areas with natural prerequisites for the development of bog iron ores or existing ore deposits beneath the topsoil level. The present study analyses topsoil properties of one of these environments (Kalinovac – Hrastova greda site), with the objective to define the geochemical markers within the area where mining and primary iron production took place in the past and distinguish markers related to bog iron ore formation mechanisms and deposit occurrence from anthropogenic markers related to activities of a bloomery iron production site. This is achieved through comprehensive analysis of 67 topsoil samples, spatially set within a regular square grid in the research area. Sampled soils are characterized by mineralogical (XRD), geochemical (pXRF), granulometric and soil Ph analysis. Statistical and spatial analysis is employed to understand potential influences on present soil geochemistry. These involve – geospatial qualitative analysis of anomalous elemental values, application of multivariate chemometric methods (PCA and HCA) and observation of the correlation between elements as well as outliers, patterns and trends that appear within data.

The analysis shows that both geochemical markers for bog iron ore occurrences and potential deposit formation as well as markers for past human activity related to processes of bloomery iron production and potential modern pollution residue can be successfully isolated from the parent soil properties. These could be used as positive indicators of past iron production environments in modern lowland, river plain landscapes.

Tomislav Brenko¹, Sibila Borojević Šoštarić¹, Tena Karavidović² & Tajana Sekelj Ivančan²

¹Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, Croatia

²Institute of Archaeology, Zagreb, Croatia

Bog iron ores in Central Croatia – formation in Kupa and Sava River plains?

The Kupa and Sava River alluvial plains are located at a crossroads between geographical and cultural regions of the south-eastern Alps, the southern Pannonian Basin and the northern Dinaric Ophiolite. Based on their position, this region most probably played a significant role in communication networks in archaeological periods. Mountainous parts of the wider region are geologically and historically known for the abundance of iron ores and their exploitation. Geoarchaeological research in the lowland Drava River basin pointed to the possibility of bog iron ore formation, processing and iron production during late antiquity and early Middle Ages. Due to similar topography, the possibility of bog iron ore formation in Kupa and Sava River plains arose as relevant for determining alternative iron ore resources in the region, possibly used in archaeological periods. To determine the potential for bog iron ore formation, field surveys were conducted along both river plains, aimed at collecting Fe-enriched soil profiles. Three profiles (toponym Pravutine, Žakanje, Osekovo) were analysed for soil properties – particle size (laser granulometry), mineralogical (XRD) and chemical (pXRF) composition.

Granulometric analysis revealed silt to be the dominant phase in all profiles, with elevated sand content in part of Pravutine profile (12.67 vol.%) (Kupa river plain) and Osekovo profile (27.87 vol.%) (Sava River plain). Geochemical analysis revealed SiO₂ as the most abundant (max. 68.01 mass.%), with Al₂O₃ (max. 25.45 mass.%) and Fe₂O₃ (max. 15.01 mass.%) following. The calculated Fe enrichment factor in analysed profiles suggests moderate enrichment. Conducted analyses point to elevated Fe contents in soils of the Kupa and Sava alluvial plains, most likely as a result of weathering and mobilization of primary Fe minerals in the study area. Although Fe quantities seem low, they indicate a significant possibility of Fe enrichment and potential bog iron formation in studied parts of the Central Croatia region.

Jasna Vuković¹, Ina Miloglav², Jacqueline Balen³ & Miroslav Vuković²

¹Department of Archaeology, Faculty of Philosophy, University of Belgrade, Serbia

²Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb, Croatia

³Archaeological Museum in Zagreb, Croatia

Smoothed and damaged: Use-wear traces on the bases of food-processing vessels from Viškovci, Eastern Slavonia

Viškovci-Gradina is a hillfort settlement near the town of Đakovo in Eastern Croatia with the remains of settlements from the Late Copper and Early Bronze Age periods. A use-alteration analysis of the assemblage originating from the Viškovci settlement revealed a distinct group of finds. It consists of 10 specimens of vessels' bases with unique use-wear traces. They appear on the outer surfaces of medium-sized or large vessels that can be connected with thermal food processing. Two zones on the bases' surfaces can be distinguished: the outer, ring-shaped zone (ca. 1.5 cm wide) appears relatively smooth. Inside this ring, the heavily abraded zone is present:

mechanical damage is usually severe, and the original surface is completely removed, occasionally with a pedestalled temper. This pattern indicates contact with some coarsely-grained surface. The methodology of use-wear traces classification will be presented: besides analysis of the origin of traces and their distribution the usage of 3D models in assessing vessel function, and some possible interpretations will be proposed. The application of use-wear traces by visualization on the 3D models reveals even the smallest irregularities in the microrelief on the vessel surface. This method of recording and visualizing traces creates opportunities for enhanced analysis and the development of classification methodologies for use-alteration studies.

Selena Vitezović

Institute of Archaeology, Belgrade, Serbia

Identification and interpretation of hunting and fishing gear from osseous raw materials in prehistory

Osseous raw materials were widely used since the Palaeolithic period, and, in particular in the Upper Palaeolithic, a wide range of different hunting and fishing implements were produced from bones and antler–spear projectiles, barbed points, hooks, etc. Osseous projectile points and fishing hooks continue to be produced in the Holocene as well.

This paper will analyse some of the main techno-types of hunting and fishing gear, in particular their technological traits, their identification of hunting and fishing weapons and differentiation from other artefact types, and also use-wear traces and the interpretation of their possible mode of use. In particular, the problems of identification and functional interpretation of hunting and fishing gear from the later prehistoric periods (Neolithic, Eneolithic and Bronze Age) period will be discussed: how morphological and technological traits may indicate use, main traits and possible mode of use of hooks and barbed points produced from red deer antler, characteristic for the Late Neolithic period, and main traits and interpretation of the so-called toggle harpoons, widespread in the southern Carpathian basin in the Late Neolithic and early metal period.

Carina Hasenzagl¹, Barbara Borgers², Verena Gassner² & Babette Bechtold²

¹Department of Archaeology, Ghent University, Belgium

²Institute of Classical Archaeology, University of Vienna, Austria

FACEM: A Repository for Ancient Mediterranean Ceramics

FACEM (Fabrics of Ancient CERamics in the Mediterranean) is an online repository of fabrics of Greek, Punic, and Roman ceramics (e.g., Black Glazed Ware, Transport Amphorae, Coarse Ware, ceramic building materials, terra sigillata) produced between the 7th century BC and the 1st century AD. It provides macro photographs with zoom-in options on the clay matrix and inclusions, as well as data on petrographic fabric compositions, vessel typo-chronology, and archaeological context as a means to identify the production technology, provenance, and distribution of ceramics from about 40 Mediterranean production sites and regions. Founded in 2011 at the University of Vienna following pioneering scholarship in provenance studies and sharing open-access ceramic data, FACEM has grown into a large interdisciplinary research community, supporting collaborations and knowledge exchange.

More than ten years after its launch, however, FACEM needs substantial technical reconstruction. The remaking of the repository (funded by the FWF Austrian Science Fund) started in October 2024. Implementation of innovative software and adaption to new needs in digital humanities (e.g., the FAIR principles) will further improve and guarantee FACEM's user-friendliness, data management, and long-term storage. Furthermore, the repository is set to undergo fundamental expansion. New data from three ongoing projects on pottery from production sites in Italy, Greece, Türkiye, and North Africa, dated between the 7th century BC and the 7th century AD, will be added. This will significantly broaden FACEM's chronological and geographical setting, opening new dialogues on the evaluation of social contacts and trade between ancient communities across the Mediterranean, making it an even more valuable resource for pottery studies in the future.

Andreja Sironić¹ & Nives Doneus²

¹Ruder Bošković Institute, Zagreb, Croatia

²VIAS – Vienna Institute for Archaeological Science, Vienna, Austria

Mortar analyses of archaeological monuments in the Mediterranean climate regions

The archaeological monuments and sites along the Croatian coast hold valuable historical information, but some present challenges in terms of accurate dating. To address this challenge, the two-year project “Mortar analyses of archaeological monuments in the Mediterranean climate regions” was initiated in cooperation between the Ruder Bošković Institute and the University of Vienna to investigate this question. Our project proposes a comprehensive approach that combines archaeological and mortar radiocarbon analysis. While mortar analysis has been used to date individual monuments in Croatia, it has not been utilized in a joint study considering both archaeological and methodological aspects of radiocarbon dating. The ancient city of Osor, on the island of Cres, and the monuments in its vicinity are prime examples of both archaeological research and the development of mortar dating methods.

The project focuses on three main areas. Firstly, the characterization of the mortar composition and identification of regional variations. Secondly, the state of mortar deterioration in relation to sea spray influence and carbonate recrystallization. Finally, the results will be contextualised within a historical framework and subsequently evaluated in comparison with the urban development of Osor and the architectural heritage of its surrounding area. The project's outcomes extend beyond the improved dating of a single building. We seek to establish a standardized methodology that can be applied to other similar monuments. By doing so, we hope to benefit also archaeological research and facilitate a broader discussion on the mortar analysis in archaeological research.



Mario Novak^{1,4,5}, Mario Carić¹, Miran Čoklo², Antonija Jonjić¹ & Anna J. Osterholtz³

¹Centre for Applied Bioanthropology, Institute for Anthropological Research, Zagreb, Croatia

²Institute for Anthropological Research, Zagreb, Croatia

³Department of Anthropology and Middle Eastern Cultures, Mississippi State, USA

⁴Department of Archaeology and Heritage, Faculty of Humanities, University of Primorska, Koper, Slovenia

⁵Department of Biological Anthropology, Institute of Biology, Faculty of Science, Eötvös Loránd University, Budapest, Hungary

Heavy metal: the first results of environmental lead poisoning study in archaeological populations from Croatia

In modern contexts, the effects of lead poisoning are well-known: decreased fertility both sexes, higher rates of miscarriage, failure to thrive in infants, and increased rates of pathological changes consistent with metabolic disease. Therefore, the aim of this paper is to present the first results of environmental lead poisoning study conducted in various archaeological sites from Croatia dated between the Bronze Age and the Early Middle Ages, but also to check for the possible correlation between lead poisoning and deteriorated subadult health. To test this hypothesis, we used bioarchaeological analysis of the bony pathologies and age at death of individuals as well as chemical analysis to determine the levels of lead that have been deposited in teeth through everyday use of objects containing lead and consumption of lead in the diet.

We focused mostly on juveniles (under the age of 20 years) to correlate age at death and pathological conditions with lead concentrations. Most individuals analysed were very young, under 6 months of age at death. In total, we analysed 164 teeth samples from 18 sites of which 140 passed quality control. In general, lead values for prehistoric sites are well below 1 ppm, while for the Roman period (and later) sites these values are much higher (an average of 5.59 ppm) thus showing a tremendous increase in environmental lead contamination between the prehistory and Late Antiquity. We could not establish any significant differences between urban and rural Roman period communities, most probably due to a relatively small rural sample. However, in our samples, we established the correlation between high lead levels and lower age at death. This strongly suggests that most of the individuals from our Roman period sites who exhibited levels over 1ppm experienced some kind of physiological stress during early childhood.

Zrinka Premužić¹, Mario Carić², Dea Ivašić³, Teresa Nicolosi⁴, Josip Burmaz⁵, Dinko Tresić Pavičić⁵ & Mario Novak^{2,6,7}

¹Department of Ethnology and Cultural Anthropology, Faculty of Humanities and Social Sciences, University of Zagreb, Croatia

²Centre for Applied Bioanthropology, Institute for Anthropological Research, Zagreb, Croatia

³Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb, Croatia

⁴Department of Cultural Heritage, University of Bologna, Italy

⁵Kaducej Ltd., Split, Croatia

⁶Department of Archaeology and Heritage, Faculty of Humanities, University of Primorska, Koper, Slovenia

⁷Department of Biological Anthropology, Institute of Biology, Faculty of Science, Eötvös Loránd University, Budapest, Hungary

Isotopes and Insights: A Pilot Study of Reconstructing the Diet and Health of Children from the Past

The Dominican monastery of Sv. Marija Milosna in Bol, Croatia was founded in 1475. At the same time, the adjoining cemetery was established and remained in use up to 1830. Archaeological excavations carried out in 2024 confirmed the presence of 120 graves. The results of initial anthropological analyses of skeletal remains provide valuable insights into the demographic characteristics and general health of the population during this period. Subsequent analyses of carbon and nitrogen stable isotopes were conducted, focusing on reconstructing the diet and general health of children. The test sample included 12 subadults aged specifically 3 to 4 years, allowing for a deeper understanding of dietary habits of the period.

This study not only contributes to a better understanding of the dietary status of children in the past but also reflects broader social and ecological conditions. We propose this approach as a model that could be applicable in similar research contexts, offering insights into living conditions and dietary practices through the analysis of skeletal remains. This method can significantly enrich archaeological studies by revealing complex relationships between demographic variables, pathological characteristics and dietary practices in a historical context.

Tea Kokotović¹, Mario Carić², Sebastijan Stingl¹, Mario Novak^{2,3,4} & Juraj Belaj¹

¹Institute of Archaeology, Zagreb, Croatia

²Centre for Applied Bioanthropology, Institute for Anthropological Research, Zagreb, Croatia

³Department of Archaeology and Heritage, Faculty of Humanities, University of Primorska, Koper, Slovenia

⁴Department of Biological Anthropology, Institute of Biology, Faculty of Science, Eötvös Loránd University, Budapest, Hungary

Incremental dentine analysis: A case study from the Church of St. Martin at Prozorje

Unlike human bones, the dentine tissue in teeth forms during childhood and does not remodel throughout the person's life. For this reason, stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope ratios in bulk dentine collagen have been used to estimate breastfeeding duration, subsistence strategies and subadult diet in archaeological populations. Incremental dentine analysis enables much higher temporal resolution. Since the timing of human dentition eruption and development is well established, microsampling of dentine allows us to track dietary changes throughout its development – i.e. the juvenile years of the individual's life – and recognize short-term dietary changes, nutritional deprivation or physiological stress. Stable carbon and nitrogen analyses of incremental dentine samples were conducted on the second permanent molar of an adult male. The skeleton originates from the Church of St. Martin at Prozorje and dates to the Early Modern period.

Based on the archaeological context, the individual is presumed to have been a member of the clergy. Apart from nutritional information from the first fifteen years of his life, variations in $\delta^{13}C$ and $\delta^{15}N$ values of dentine sections, in conjunction with the bioarchaeological information from the skeleton and historical sources, allowed us to pinpoint periods of nutritional stress as well as dietary change which coincide with the time of his admission to the seminary. This is the first time that incremental dentine analysis was performed on an archaeological sample from Croatia, and provides a targeted reconstruction of specific events in the early life of this particular individual.

Saša Kovačević

Institute of Archaeology, Zagreb, Croatia

Building the Past: The Use of Wood in Eastern Hallstatt Culture Settlements and Burials in the Podravina Region (NW Croatia)

This talk presents more recent discoveries from the Eastern Hallstatt culture in the Podravina region of northwestern Croatia. The analysis highlights significant wooden structural elements within the settlements, as well as the use of wood and charcoal in the researched princely burial mounds. The role of wood as a primary construction material and the intriguing implications of the abundant use of charcoal in certain burial mounds will be further examined.

Additionally, the presentation addresses key chronologically and culturally relevant discoveries and presents the significant Early Iron Age landscape in the Pitvica and Bednja River basins researched in the past few years by the Institute of Archaeology in Zagreb. These finds reveal both cultural and chronological connections between northwestern Croatia and neighboring regions, as well as more distant areas. The importance of these discoveries is underscored by their status as well-documented evidence from recent excavations – a relative rarity in northwest Croatia.

POSTER ABSTRACTS

Laura Ortiz de la Guía & Alberto Dorado Alejos

Department of Prehistory and Archaeology, University of Granada, Spain

How is a mummy made? First analytical results of the construction materials associated with the sealing of tomb 121 in Castellón Alto (Galera, Spain)

The Argar culture (2250 – 1550 cal BC), defined by the Siret brothers, from the excavations carried out at the end of the 19th century, is one of the most representative archaeological sites of the Iberian prehistory. The studies carried out on this culture, establish the limits of its extension to the territories of Murcia, Almeria, part of Granada, Jaen and Alicante and place it chronologically, approximately, between 2250 and 1550 BC. The investigation of their common features, shared by numerous settlements, has constituted a great contribution to the knowledge of the communities of the Bronze Age. Undoubtedly, going into the funerary field, means generating new contributions to the knowledge of this culture, now from the implementation of analytical techniques applied to the layer of mud that seals the burial of one of the most significant tombs of this culture: the tomb 121 of the site of Castellón Alto, known as the ‘mummy of Galera’.

This poster aims, therefore, to present the first analytical results obtained by Polarized Light Microscopy (PLM), Scanning Electron Microscopy (SEM), Colorimetry, Fourier Transform Infrared Spectroscopy in Attenuated Total Reflectance mode (FTIR-ATR) and X-Ray Diffraction (XRD), showing aspects such as the composition of the materials used, their origin or even the way in which they were processed or transformed for their use.

Paula Pinillos de la Granja, Alberto Dorado Alejos & Juan Antonio Cámara Serrano

Department of Prehistory and Archaeology, University of Granada, Spain

A technological approach to Bell Beaker pottery (2500/2450 – 2350 BC) from southeast of the Iberian Peninsula

The poster presents the results of the macroscopic observations and petrographic analysis of Bell Beaker pottery. This analysis therefore focuses on the Chalcolithic ceramic finds unearthed during the excavation campaigns directed by W. Schüle in the 1960s and 1970s as well as those of the intervention of 1986 within the framework of the “Millares Project”. Technology is a social phenomenon that determines the decision-making process, from the procurement of raw materials to the finished products and their use. Thus, the methodological strategy implemented for the study aims to analyse the continuities and changes in the pottery production sequence during the transitional phase of the Pre-Bell-Beaker phase (2600 – 2500 BC) to early Bell Beaker phase (2500/2450 – 2350 BC) in the southeast of Iberia. In this work, a macroscopic analysis was carried out on 66 samples using the Leica Zoom 2000 stereoscopic loupe (10.5 X magnification) for the description of the ceramic fragments, analysis of the external surfaces and of the matrices.

The next phase consisted of a petrography study of 13 thin sections in order to expand the information from the textural analysis of the ceramic pastes. The thin section was observed using a petrographic microscope with plane polarised light and BMS 100-series crossed nicols with T2 adapter for Canon EOS cameras. The description uses the modified system of Whitbread (1995). The grain size distribution and orientation of the components is calculated following the guidelines of Bullock (1985) and apply the frequency category according to Matthew (1997). The study sheds new light on how technological tradition participates in phenomena of change, stability and the discussion of social complexity in the southeastern Iberian. The general uniformity of the raw materials suggests a local provenance. However, variations are detected in the percentage use of certain and specific characteristics in the ceramic manufacturing patterns of large vessels.

Andrej Bašić¹ & Ivan Jerković²

¹ Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split, Croatia

² University Department of Forensic Sciences, University of Split, Croatia

Application of digitization and additive manufacturing in cultural heritage: An economic approach “More with Less”

This paper explores the potential application of digitization and 3D printing in preserving and presenting cultural heritage through the lens of the “More with Less” economic approach. Digitization and 3D printing enable the creation of accurate replicas and virtual representations of cultural artefacts, offering new possibilities for education, research, and tourism promotion while reducing physical exposure and wear on original objects. The paper analyses the economic aspects of implementing these technologies, including costs, savings, and potential revenues, and how the “More with Less” approach can optimize resources in cultural institutions. Through several case studies and analyses, the paper presents concrete examples and results of successful

digital solutions in museums and other heritage preservation institutions. The conclusion examines future directions and challenges in the broader adoption of digitization and 3D printing, as well as the implications for the sustainability of cultural heritage in the context of limited resources.

Denitsa Sandeva-Minkova

National Archaeological Institute with Museum, Bulgarian Academy of Sciences, Bulgaria

Non-destructive methods for registration of archaeological sites and destructive investigation on the territory of the Ludogorsko Plateau, Northeastern Bulgaria

The study presents the non-destructive and subsequent destructive archaeological investigations of a small area in Northeastern Bulgaria. The research is part of my PhD thesis, which is dedicated to the spatial patterns and dynamics of habitation during the Bronze and Iron Ages on the territory of the Ludogorsko Plateau. Surveys in the area include the identification of archaeological sites from satellite imagery. For this purpose, a tool in Google Earth Pro is used to “go back in time”, which allows the same area to be observed in different years. The spots that are the object of the study are clearly distinguished from the surrounding terrain. The next stage is their verification on the field, which is carried out through targeted field searches.

Archaeological materials were found at the sites visited, usually pottery, but in some cases small finds including spindle whorls, flints and stone tools. Geophysical measurements have been made at some of the registered sites in the area, indicating the presence of anomalies varying in their characteristics. The information collected in the field is stored and processed in an open-source geographic information software – QGIS. The use of this software clearly shows the high concentration of spots in the area of the Topchiyska River, which, although it is shallow today, clearly had an important role in the past.

Mislav Godanj, Borna Sabljak & Karla Vujčić

Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb, Croatia

Detection and analysis of new archeological sites using the methodological approach of the QField application

The free geographic information software, QGIS, has established itself as a standard tool in archaeology. However, the QField application, which is used for collecting and managing geospatial data, has not yet seen widespread use. This presentation will concentrate on recent archaeological field surveys conducted in the eastern part of Croatia, particularly within the municipality of Cerna. These surveys utilized the QField app to map the density of artefacts, diagnostic pottery fragments, or structures visible in airborne LiDAR-derived imagery.

The paper will offer insights into the generated maps of newly discovered sites, illustrate the distribution of materials, and highlight the artefacts themselves, which played a crucial role in determining the periods to which the sites belong.

Maria C. Codlin¹, Sarah Sandron¹ & Tomislav Fabijanić²¹Dipartimento di Scienze della Vita e Biologia dei Sistemi, Università degli Studi di Torino, Italy²Department of Archaeology, University of Zadar, Croatia*ZooMS analysis of an eggshell from early medieval grave from Dubravice (northern Dalmatia)*

The early medieval necropolis on the site “Pred novom župnom kućom” (“In front of the new parish house”) is situated in the village of Dubravice in northern Dalmatia. It was discovered by chance in 1986. In subsequent archaeological campaigns 67 inhumations have been excavated that can be dated to the second half of the 8th c./the beginning of the 9th c. Several early medieval urns were discovered also, making this site one of only few Dalmatian archaeological sites where early medieval incinerations are attested. In the year 1986, the eggshell was found in one of the pottery vessels (most likely in the grave 37). This find of an eggshell in Dubravice is not unique in Croatia, however, this custom is rare. It is supposed that the eggs in the graves from the early Middle Ages are chicken eggs, mainly because of the symbolic significance of eggs in general.

Because of the good level of preservation of the eggshell from Dubravice, we decided to analyse it by mass spectrometry with the aim of obtaining taxonomic identification using ZooMS (Zooarchaeology by Mass Spectrometry). Proteins were extracted using micro-destructive sampling and processed following published protocols. The resulting protein digests were analysed by MALDI-TOF mass spectrometry in order to obtain the peptide mass fingerprint of the sample. The sample’s mass fingerprint was compared to a reference library of known peptide sequences and masses from avian eggshell proteins. The analysis of the eggshell from Dubravice site found that the sample provided a high-quality spectrum with distinct marker peaks, demonstrating adequate preservation for taxonomic identification, particularly the peaks corresponding to ovocleidin 116 suggest a potential species-specific marker for *Gallus gallus*, highlighting the sample’s utility for precise taxonomic classification.

Ante Lozina

University Department of Forensic Sciences, University of Split, Croatia

*Studying ancient human remains:**Challenges of scientific analysis amidst cultural descendants’ rights*

This study aims to explore the methodological, legal, ethical and cultural challenges encountered in the scientific analysis of ancient human skeletal remains, particularly in the context of respecting the rights and beliefs of cultural descendants, with special emphasis on the native population of post-colonial countries. The goal is to identify strategies that enable the occurrence of a delicate balance between scientific inquiry, sensitivity of cultural descendants’ rights and legal compliance. The study highlights that research on ancient human skeletal remains is a contentious subject interlacing historical, scientific, religious and ethical themes. It involves an extensive review of bioarchaeological research on ancient human skeletal remains, with a particular focus on cultural descendants’ rights, repatriation of skeletal remains and the ethical dimensions within the existing legal framework. The study accentuate the necessity for a balanced approach that honors both cultural heritage and scientific inquiry. It focuses on documented instances of conflict and cooperation between scientists and descendant communities, as well as advancements in non-destructive ana-

lytical techniques. Methods encompass qualitative analysis of case studies, legal analysis of relevant acts, and a review of technological innovations in bioarchaeological methodology. Balancing the scientific study of ancient human remains with the rights of cultural descendants is a complex but essential task. The research emphasizes the importance of cooperation between scientists and cultural descendants in the context of research on ancient human skeletal remains but also highlights the importance of ethical considerations, legal compliance, and methodological innovation. By encouraging cooperation with communities of cultural descendants and developing non-destructive techniques, scientists can advance our understanding of human history while honoring the cultural heritage of native communities. This balanced approach is pivotal for the continued progress of archaeological research and ethical integrity.

12
twelve

EXHIBITION

FIRST VILLAGES –
LOST WORLD OF THE NEOLITHIC SOUTHEAST
TRANSDANUBIA

23rd October 2024 – 1st February 2025

ARCHEOLOGICAL MUSEUM IN ZAGREB

19 Nikola Subic Zrinski Square

1st floor

WORKING HOURS

Tuesday – Saturday

10 am – 6 pm

SEE MORE ABOUT THE EXHIBITION AT

<https://www.amz.hr/en/exhibitions/first-villages-last-world-of-the-neolithic-southeast-transdanubia/>

arheološki
muzej
u zagrebu
archaeological
museum
in zagreb

JANUS
PANNONIUS
MUZEJ
PÉCS

RIPPL-RÓNAI
MUZEJ
KAPOSVÁR

WOSINSKY MŰR
MUZEJ
SZEKSZÁRD

HUN-REN
ISTRAŽIVAČKI
CENTAR ZA
HUMANISTIČKE
ZNANOSTI
INSTITUT ZA
ARHEOLOGIJU

PRVA NASELJA —
IZGUBLJENI SVIJET
MLAĐEG
KAMENOG DOBA
JUGOISTOČNOG
PODUNAVLJA



izložba
exhibition

23-10-2024 – 01-02-2025

arheološki muzej u zagrebu
archaeological museum in zagreb

www.amz.hr

TRG NIKOLE ŠUBIĆA ZRINSKOG 19



12
twelve

PUBLICATIONS





Papers from the 1st and 2nd conference *Methodology and Archaeometry* are published in the Journal *Opuscula Archaeologica* 39/40, Department of Archaeology, Faculty of Humanities and Social Sciences of the University of Zagreb, Zagreb, 2018.

https://hrcak.srce.hr/index.php?show=toc&id_broj=17098

Papers from the 3rd and 4th conference *Methodology and Archaeometry* are published in a book *Recent Developments in Archaeometry and Archaeological Methodology in Southeastern Europe*, Cambridge Scholars Publishing, Cambridge, 2020.

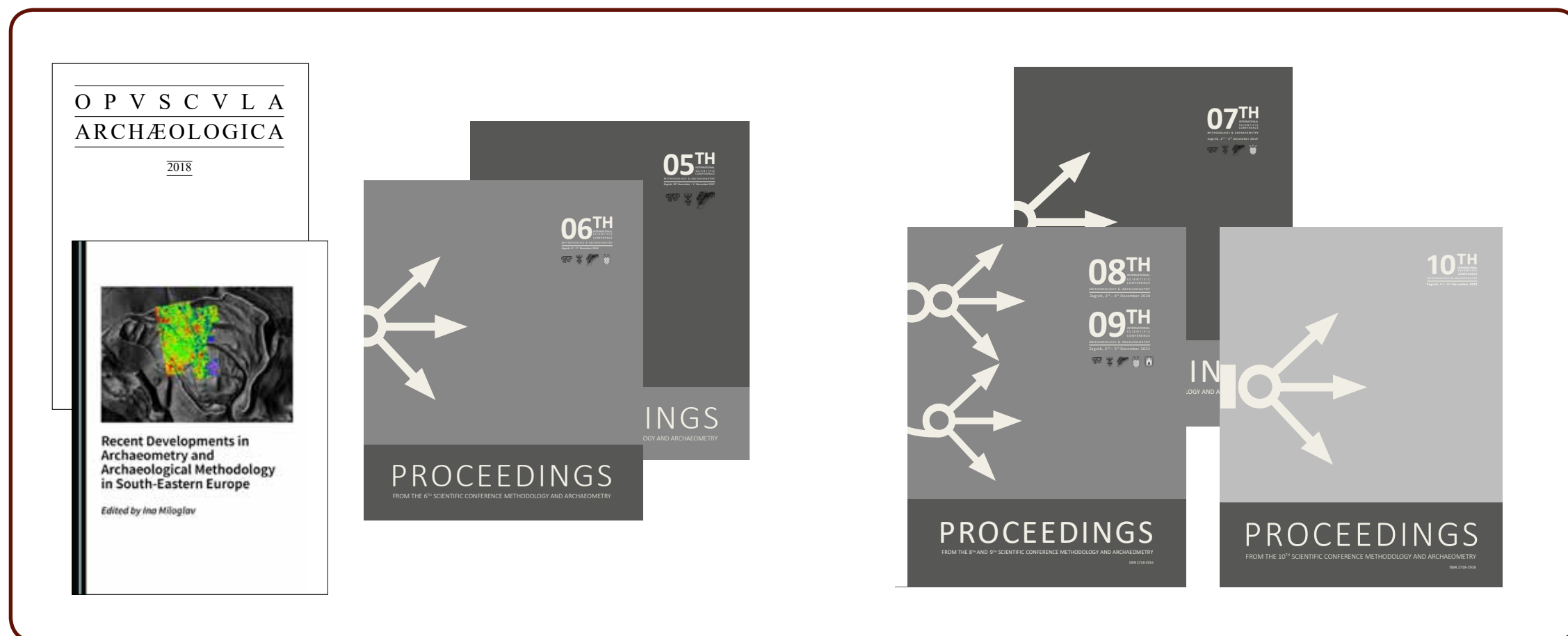
https://www.cambridgescholars.com/recent-developments-in-archaeometry-and-archaeological-methodology-in-south-eastern-europe?fbclid=iwar0nmmpb4m_uizm6gsxwiqdi422ursres9oy-0owlrp9gyjm3r316dghchas



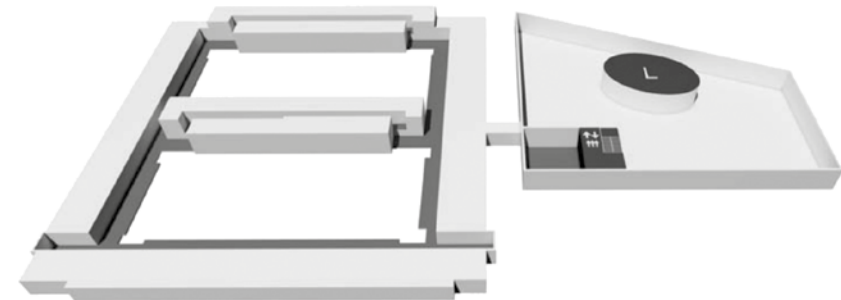
Since 2019 papers from the conference are published in the *Proceedings from the scientific conference Methodology and Archaeometry* on a platform for open access books of the Faculty of Humanities and Social Sciences, University of Zagreb (FF Open Press).

Proceedings are available on:

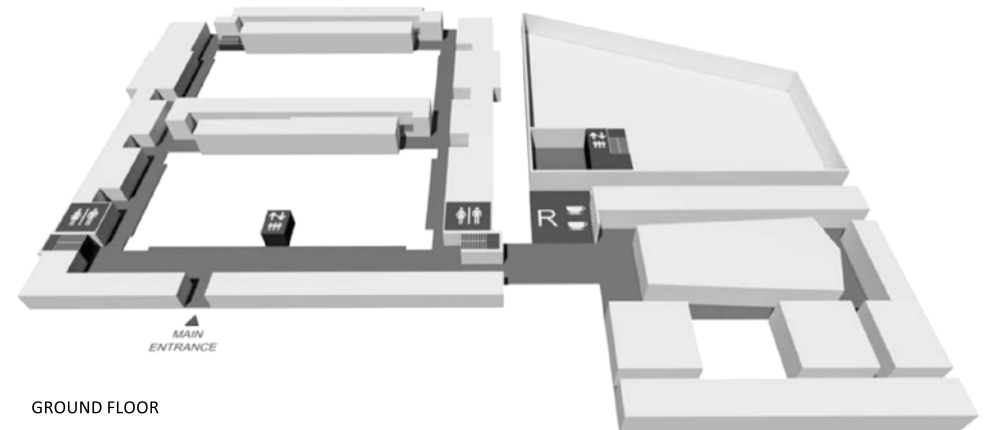
<https://openbooks.ffzg.unizg.hr/index.php/FFpress/catalog/series/MetArh>



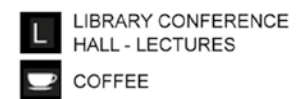
Faculty of Humanities and Social Sciences of the University of Zagreb
GROUND PLAN



2ND FLOOR



GROUND FLOOR

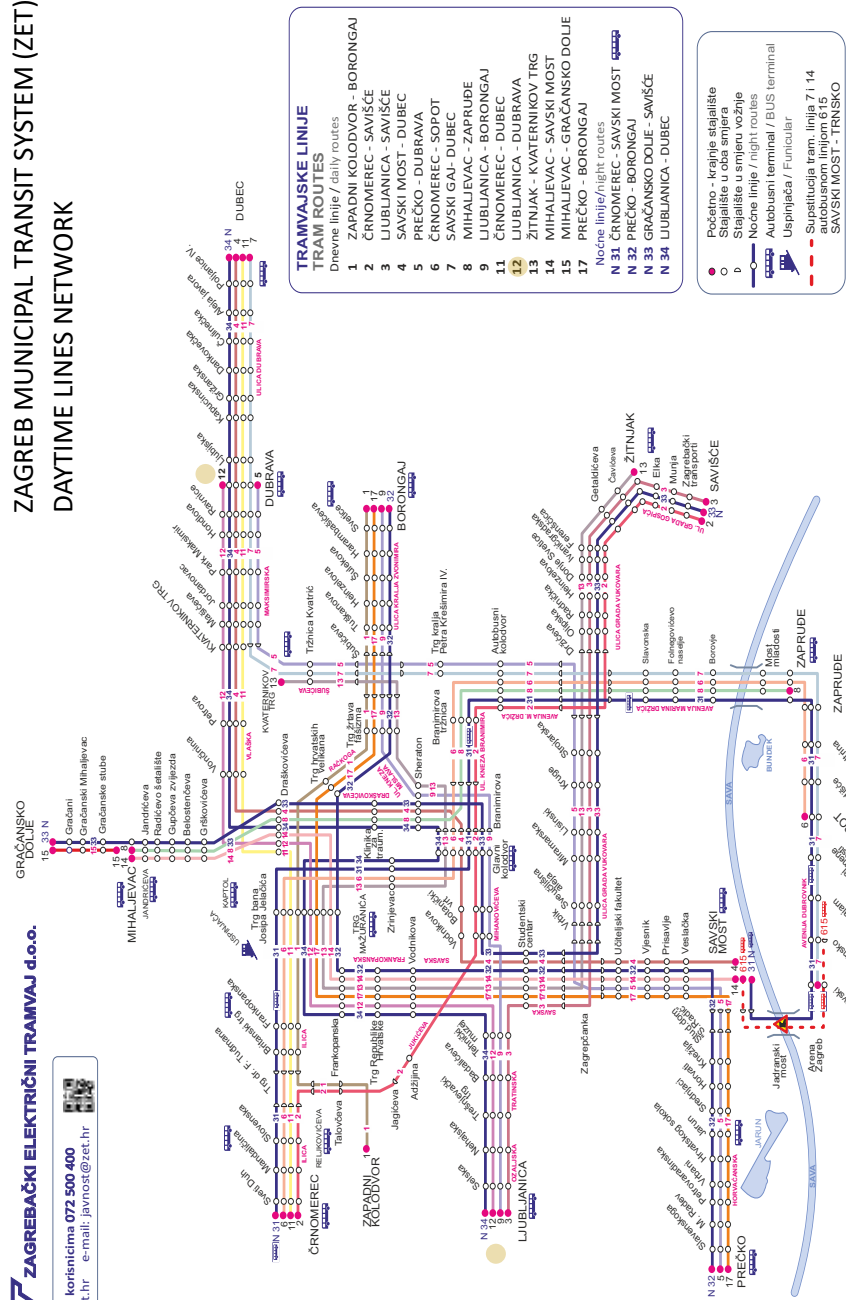


The lectures will be held at the Conference hall on the 2nd floor of the Faculty Library (on the right of the main entrance of the Faculty building).



ZAGREB MUNICIPAL TRANSIT SYSTEM (ZET) DAYTIME LINES NETWORK

TRAM SCHEDULE: <https://www.zet.hr/tram-lines/daytime-lines/591>

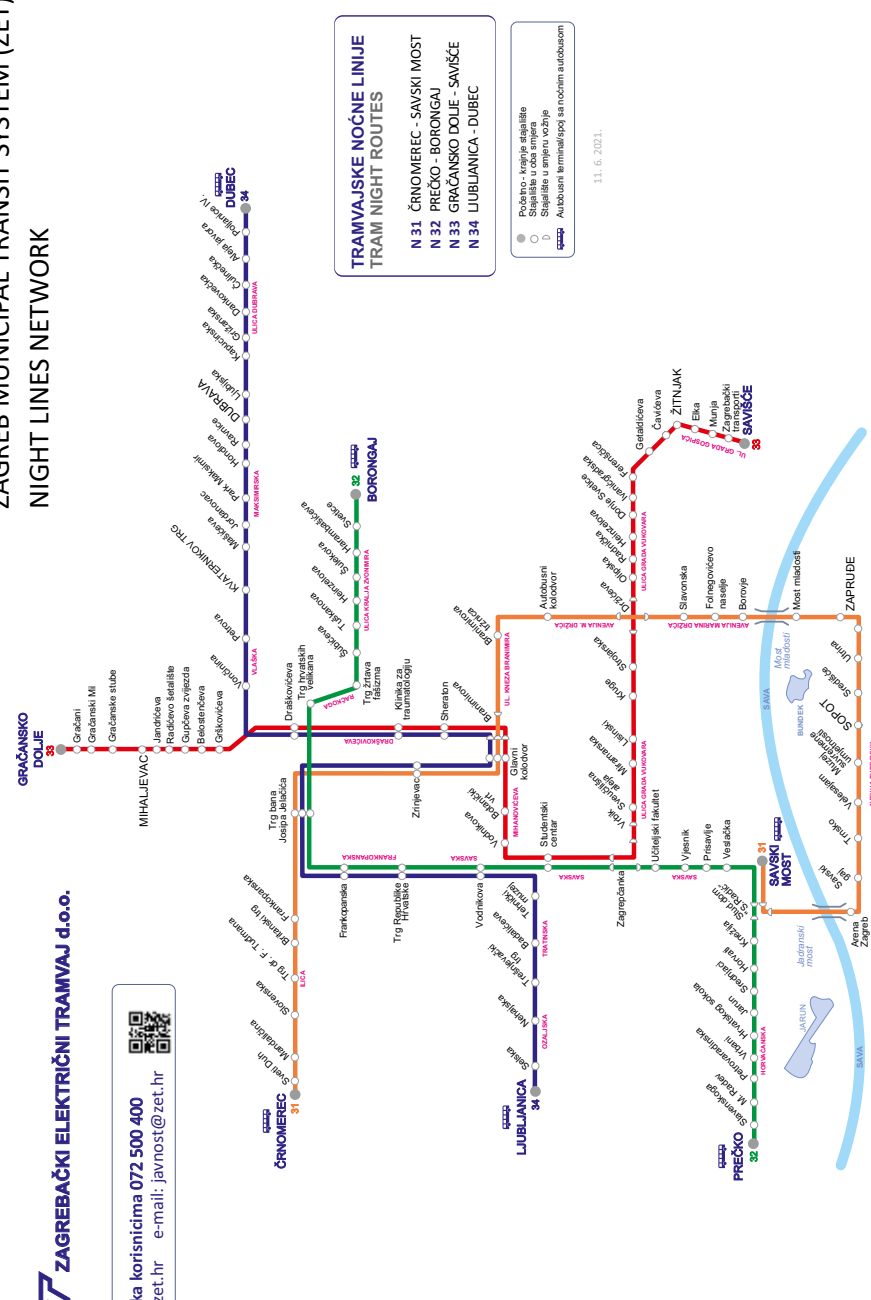


LINJE 1, 3 I 8 NE PROMETUJU SUBOTOM, NEDJELJOM I BLAGDANOM
LINES 1, 3 AND 8 DO NOT OPERATE ON SATURDAY, SUNDAY OR PUBLIC HOLIDAYS

ZET ZAGREBAČKI ELEKTRIČNI TRAMVAJ d.o.o.
Podrška korisnicima 072 500 400
www.zet.hr e-mail: javnost@zet.hr

ZAGREB MUNICIPAL TRANSIT SYSTEM (ZET) NIGHT LINES NETWORK

TRAM SCHEDULE: <https://www.zet.hr/tram-lines/night-lines/592>



ZET ZAGREBAČKI ELEKTRIČNI TRAMVAJ d.o.o.
Podrška korisnicima 072 500 400
www.zet.hr e-mail: javnost@zet.hr



12
twelve

