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**10TH**  
INTERNATIONAL  
SCIENTIFIC  
CONFERENCE  
METHODOLOGY & ARCHAEOLOGY  
Zagreb, 1<sup>st</sup> – 2<sup>nd</sup> December 2022

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# 10<sup>TH</sup>

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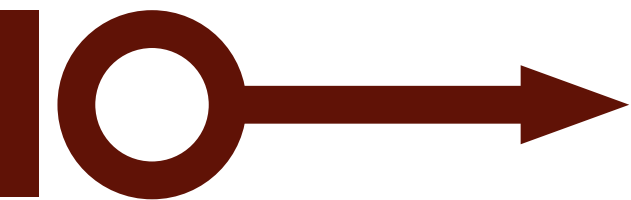
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# Book of abstracts

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**T**he 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 arhaeometrical 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.





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## *PROGRAMME*





**Thursday, 1<sup>st</sup> of December****10:00 – 10:15*****Conference opening*****Keynote lecture:*****Chair: Ina Miloglav*****10:15 – 10:55****Patrick Sean Quinn****Scientific analysis of archaeological ceramics: Findings and thoughts from a quarter century of research****11:00 – 11:30*****Coffe break*****Session 01*****Chair: Jacqueline Balen*****11:30 – 11:45****Ana Fundurulić, Ana Manhita, Sérgio Martins, Leonor Rocha, Dora Teixeira, Alessandra Celant & Cristina Barrocas Dias****Organic residue analysis of funerary vessels from the Great Dolmen of Zambujeiro, Portugal****11:50 – 12:05****Andreja Kudelić, Natali Neral & Lujana Paraman****Bronze Age Pottery from central Dalmatia – archaeometric approach****12:10 – 12:25****Maja Miše & Jelena Jovanović****Potters and painters: Application of geochemical analysis to Greek and Hellenistic painted vases****12:30 – 12:45****Benjamín Cutillas-Victoria & Anno Hein****Non-invasive protocol for the study of the post-firing painted ware from the Iberian Peninsula****12:50 – 13:10*****Coffe break***



## Session 2

*Chair: Predrag Novaković*

13:10 – 13:25

**Dimitrij Mlekuž Vrhovnik**

**Modelling long-term demographic patterns of the area of Slovenia**

13:30 – 13:45

**Zoran Čučković**

**Digital landscapes: new algorithms for archaeological site detection and mapping on the basis of Lidar data**

13:50 – 14:05

**Domagoj Tončinić, Miroslav Vuković, Joško Zaninović & Domagoj Bužanić**

**The transformation of the cultural landscape between the Krka and Cetina rivers: Preliminary analysis of potential archaeological structures recognized on LiDAR images**

14:10 – 14:25

**Jerko Luka Gašpar**

**Viewshed analysis of Late Antique fortresses of eastern Adriatic coast and the methodological questions it raises**

14:30 – 14:45

**Andrej Janeš, Palma Karković Takalić & Valerija Gligora**

**The construction history of the Ledenice castle: application of the archaeology of standing structures**

14:50 – 15:05

**Michael Doneus, Bernhard Höfle, Dominic Kempf, Gwydion Daskalakis & Maria Shinoto**

**AFwizard – Human-in-the-loop development of spatially adaptive ground point filtering pipelines**

15:10 – 16:00

**Lunch break**

## Session 3

*Chair: Miroslav Vuković*

16:00 – 16:15

**Luka Gruškovnjak, Agni Prijatelj, Petra Vojaković & Matija Črešnar**

**A smithy revealed by the micro-refuse analysis in the Late Halstatt Building 24 at the hillfort of Pungrt above Ig, Slovenia**

16:20 – 16:35

**Agni Prijatelj, Luka Gruškovnjak, Petra Vojaković & Matija Črešnar**

**From a house to a stable: a micromorphological study of the Late Hallstatt Building 21 at the proto-urban hillfort of Pungrt above Ig, Slovenia**

16:40 – 16:55

**Luka Gruškovnjak**

**The influence of topography and soil geomorphology on the archaeological record within the landscape**

17:00 – 17:15

**Katarina Jerbić**

**Assessing the archaeological and paleo-environmental potential of a submerged prehistoric site: A case study from Zambratija Bay**

17:20 – 17:35

**Tena Karavidović & Tomislav Brenko**

**Reconstruction of bog iron ore deposits in the lowland landscape: a case study predictive model for the analysis of exploitation in archaeological periods**

17:40 – 18:00

**Coffe break**

#### **Session 4**

**Poster presentation**

18:00 – 18:30

**Mila Andonova-Katsarski**

**Bio-archaeology of the pit-fills of Sexaginta Prista (2BC – 1AD)**

**Dario Hruševar, Koraljka Bakrač, Božena Mitić, Ivona Baniček & Rajna Šošić-Klindžić**

**The Neolithic site Gorjani-Topole – preliminary results of palynological analysis from the Slavonia region (eastern Croatia)**

**Valentina Lončarić**

**Image-based low-powered technological analysis of archaeological ceramics and its potential on-site and educational applications**

**Dunja Martić Štefan**

**Sickle gloss on knapped flint artefacts recovered at the Galovo Site in Slavonski Brod and the Dužine site in Zadubravlje**



**Emilija Nikolić, Ivana Delić-Nikolić, Ljiljana Miličić, Nevenka Mijatović, Mladen Jovičić & Snežana Vučetić**

**Searching for elements – creating a composition: from archaeometry to conservation of Roman constructions on the Danube in Serbia**

**Tosho Spiridonov & Svilen Stoyanov**

**DAGIS 4.0 – Balkan Information System**

**Katarina Šprem, Lana Blažinić, Elena Orbanić & Adriana Sponza**

**Lithic analysis of finds from the field surveys of Lovas Municipality, Eastern Croatia**

**Selena Vitezović, Danica Mihailović, Vidan Dimić & Dragana Antonović**

**Tracing prehistoric mines and quarries: preliminary results of the field survey of Rudnik area (Central Serbia), campaign 2021**

**Katarzyna Zdeb & Maciej Sierakowski**

**Food biomarkers in glazed pottery**

**Veronika Gencheva**

**Geospatial archaeological database of Eastern Rhodopes, Bulgaria**

**Milica Tapavički-Ilić & Timka Alihodžić**

**All soul is immortal (Plato)**

**Pio Domines Peter**

**More than shells and shrapnels: Approaching the materiality of Second World War in karst landscape - Case study of battlefield site on Kozjak hill (Senj, Croatia)**

**Sara Iglić, Igor Kulenović & Šime Vrkić**

**Community, archaeology and modern conflicts – example of Obrovac, Croatia**

**Friday, 2<sup>nd</sup> of December**

**Session 5**

***Chair: Selena Vitezović***

**10:00 – 10:15**

**Petros Chatzimpaloglou**

**Provenance investigation of stone tools and its archaeological application**

**10:20 – 10:35**

**Vidan Dimić**

**The use of polished stone axes and adzes in the Neolithic of Serbia - experimental research**

10:40 – 10:55

**Kata Szilágyi, György Szakmány, Sági Tamás, Józsa Sándor, Szilágyi Veronika, Oláh István, Anett Osztás & Katalin T. Biró**

**Preliminary results of provenance studies on the polished stone material at the Neolithic site of Alsónyék, Hungary**

11:00 – 11:15

**Tamás Sági, György Szakmány, Sándor Józsa, Veronika Szilágyi, Kristóf Fehér, István Oláh & Anett Osztás**

**Polished stone tools from the Bátaszék-Alsónyék Neolithic settlement (Hungary)**

11:20 – 11:50

**Coffe break**

## Session 6

*Chair: Maja Miše*

11:50 – 12:05

**Meghna Desai & Thilo Rehren**

**Carbon content determination of hypereutectoid wootz steel using image analysis**

12:10 – 12:25

**István Fórizs & Kata Dévai**

**New data on the cage cup fragments from Gorsium/Herculia, Pannonia (Hungary)**

12:30 – 12:45

**Mila Andonova-Katsarski**

**The archaeological softwoods of ancient Serdica (Sofia, Bulgaria)**

12:50 – 13:05

**Katarina Botić, Tena Karavidović, Tajana Sekelj Ivančan & Metka Culiberg**

**Between technological choices and resource availability: an insight into wood exploitation strategies for iron production and common use**

13:10 – 13:25

**Ana Đuričić**

**Late Neolithic Vinča culture hearths – location identification and function**

13:30 – 14:00

**Coffe break**

## **Session 7**

*Chair: Nikola Vukosavljević*

**14:00 – 14:15**

**Tina Bareša, Ivan Jerković, Anita Adamić Hadžić, Mario Šlaus, Mislav Čavka, Željana Bašić & Ivana Kružić**

**Visibility of epigenetic cranial traits on multi-slice computed tomography (MSCT) scans and dry bones**

**14:20 – 14:35**

**Lia Vidas, Sara Silvestrini, Matteo Romandini, Federico Lugli, Cristina Real Margalef, Siniša Radović, Ivor Janković & Stefano Benazzi**

**Filling in the blanks: the application of palaeoproteomics in faunal analysis**

**14:40 – 14:55**

**Kyriaki Tsirtsi & Evi Margaritis**

**Plants and people in Classical/early Hellenistic Sikyon: what we got through the analysis of archaeobotanical material**

**15:00 – 15:15**

**Andreja Sironić, Alexander Cherkinsky, Damir Borković, Jadranka Barešić & Ines Krajcar Bronić**  
**International radiocarbon mortar dating intercomparison – MODIS2**

**15:20 – 15:35**

**Marija Krečković Gavrilović, Mihailo Radinović, Marko Porčić, Jugoslav Pendić, Lidija Milašinović & Sofija Stefanović**

**Absolute and relative chronology of the Early Bronze Age necropolis in Mokrin, Serbia**

**15:40 – 15:55**

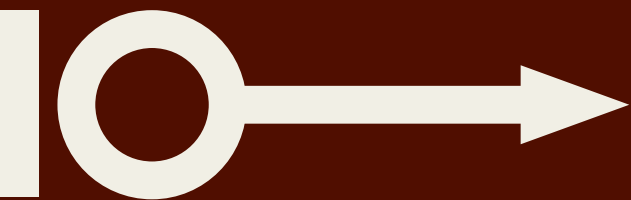
**Predrag Novaković**

**How much and what STEM are we teaching in archaeology?**

**16:00**

**Closing**

## *ABSTRACTS*







Middle Ages. Analysis of ore properties and deposits can contribute to the understanding of natural mechanisms that conditioned the exploitation and use of ores in the past. However, locating the deposits used by past societies is challenging, due to the possibility of full exploitation in the past, degradation and inhibited regeneration or development caused primarily by long-term human activities and the subsequent impact on the environment. Geoarchaeological research showed that in the modern landscape of the Podravina region, the Kalinovac - Hrastova greda 1 - 3 position, had the highest potential for ore development and the only, partially destroyed ore deposit known today. Based on multi-method predictive analysis, a model of the formation mechanism, physiognomy and potential area of deposit development in the lowland region of the Drava River alluvial plain is proposed. Methods of deposit recognition within the natural environment (pedological, relief, hydrological and vegetational indicative features) as well as the spatial dependency of potential deposit formation (exploitation) areas and positioning of archaeological sites with iron production remains are discussed. Data from surface field survey, geoarchaeological probing, predictive spatial analysis and satellite imagery analysis as well as granulometric, mineralogical (XRD) and chemical analysis (ICP - AES) of samples of ore development stages are used in the study.

### **Petros Chatzimpaloglou**

Department of Archaeology, University of Cambridge, UK

### **Provenance investigation of stone tools and its archaeological application**

**S**tone tools are a vital component of the material culture of prehistoric communities and useful markers of technological, cultural and social change. Indeed, the origin of the raw materials and the technologies employed on tools have been investigated in order to understand the identities of prehistoric people and their social organization. Furthermore, they have contributed to the identification of trade/exchange networks and possible interactions between these societies. Therefore, addressing the provenance of stone tools is a new potential avenue of research that might be able to address some of the uncertainties surrounding the socio-cultural transformation of the Balkan and beyond. This presentation will focus on a successful provenance investigation conducted on Neolithic stone tools and artefacts from Malta and rock resources from Malta and Sicily. It will explain the main components of this methodological approach and provide background information about the Neolithic period in Malta. These will be followed by suitable examples demonstrating the application of such interdisciplinary research. Additionally, it will display some initial findings of a research project working on Palaeolithic lithic assemblages found at sites near Banja Luka (North Bosnia). These will be used to highlight the great prospects of such investigations for a better understanding of Balkan prehistory.

### **Vidan Dimić**

Institute of Archaeology, Belgrade, Serbia

### **The use of polished stone axes and adzes in the Neolithic of Serbia – experimental research**

**T**he polished stone tools with cutting edge, in addition to other polished stone objects with practical and symbolic use, represent a peak of stone processing in prehistory. The main types of these tools are polished stone axes, adzes, and chisels, which in the Neolithic, we can assume, to the greatest extent have practical use in woodworking. It is also reasonable to assume that

some of these tools were used in a number of other activities in the Neolithic, such as butchering, hide processing, digging, making bone/antler tools, or as a battle or symbolic tools, as evidenced by numerous ethnoarchaeological examples. The use of polished tools with cutting edge, and their efficiency at work, is one of the least researched aspects of the polished stone industry, therefore the reconstruction of their use was a significant and very inspiring segment within a much wider archaeological experiment conducted between 2016 and 2019. One of the goals of this phase of the experiment was to offer answers to various research questions from a functional-technological point of view, among which the following stands out: what is the reason for the noticeable predominance of adzes in relation to axes at Neolithic sites in Serbia? Based on previous analyses of the materials, we know that adzes are much more represented than axes, so we were interested in whether such quantitative disproportionality is a consequence of the greater functionality, efficiency, or applicability of adzes. We wanted to determine how much time and physical effort are required to carry out each segment of the operational chain in the life cycle of these tools, as well as to examine the dynamics of their damage and repairs. One of the main focuses was on determining the effectiveness of axes and adzes when performing various woodworking tasks. The presentation shows the preliminary results of the experiment which will be expanded in the future to other abovementioned activities and materials.

**Kata Szilágyi<sup>1</sup>, György Szakmány<sup>2</sup>, Tamás Sági<sup>2</sup>, Sándor Józsa<sup>2</sup>, Veronika Szilágyi<sup>3</sup>, István Oláh<sup>4</sup>, Anett Osztás<sup>5</sup> & Katalin T. Biró<sup>6</sup>**

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<sup>4</sup> Independent researcher

<sup>5</sup> Institute of Archaeology, Research Centre for the Humanities, Budapest, Hungary

<sup>6</sup> Hungarian National Museum, Budapest, Hungary

### **Preliminary results of provenance studies on the polished stone material at the Neolithic site of Alsónyék, Hungary**

**T**he polished stone assemblage from the settlement features and burials of Neolithic (ca. 5800-4500 cal BC) Alsónyék-Bátaszék site were studied by macro- and microscopic petrographic and instrumental analyses. It is our aim to integrate the entire lithic assemblage into a comprehensive database and apply archaeological and geological approach with equal importance. The majority of the raw materials of the polished stone tools originates from Mecsek Mountains in the vicinity of the site (Lower Cretaceous alkaline igneous rocks, variegated marl, bituminous limestone, spiculite). In addition to the local lithic types, many stone tools made from long-distance raw materials: mainly serpentinite, contact metabasite (so-called Železný Brod type), hornfels, 'white stone', and the less frequent Na-pyroxenite, eclogite and nephrite, which indicate the Czech Massive, Transylvania, Banat and the Alps as raw material source areas. The primary tool types are variable axes, adzes, chisels, and maces. We observed correlations between the main lithic types and the axe's shape in several cases. The imported stone tools made from extremely high-quality raw materials (e.g. contact metabasite, hornfels or 'white stones') are significantly smaller sized than stone tools made from local raw material. The working traces of axes recovered from the graves show great variability. Many of them are finely crafted and perfectly polished, with no signs of wear visible to the bare-eye, while others show wear, resharpening, chipping and cracks from use. A further aim of our work is to refine the raw material groups and supply zones by means of mostly non-destructive petrographic and geochemical analyses. From an archaeological point of view, in addition to the



**STORIES OF THE PAST —  
JOURNEY INTO LOST LANDSCAPES**

During the conference the exhibition of the Archaeological Museum in Zagreb *Stories of the Past – Journey Into Lost Landscapes* will be presented in the Library Hall of the Faculty of Humanities and Social Sciences.

The exhibition will be opened from  
**1<sup>st</sup>–9<sup>th</sup>** of December 2022.

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u zagrebu  
archaeological  
museum  
in zagreb

# PRIČE IZ PROŠLOSTI — PUTOVANJE U IZGUBLJENE KRAJOLIKE

## — STORIES OF THE PAST — JOURNEY INTO LOST LANDSCAPES

 **Interreg**   
Danube Transnational Programme  
Danube's Archaeological  
eLandscapes



izložba  
exhibition

01-09-12-2022



The exhibition ***Stories of the past – journey into lost landscapes*** allows visitors to experience the heritage as it once was through the use of the latest visualizations of virtual and augmented reality technology, created as part of the Interreg project *Virtual Archaeological Landscapes of the Danube Region*.

Digital visualizations are presented through different media and they offer visitors to explore the landscape of three Iron Age sites through VR glasses (Kaptol in the Požega basin in Croatia, Großklein in Austria and Ulaka in Slovenia). Digital visualizations of the Paleolithic site of the Vindija cave near Varaždin, the Bronze Age site of Viškovci-Gradina near Đakovo, the Iron Age site of Großklein in Austria and the Roman city of Flavia Solva in Austria are presented via touchscreen technology.

### **The exhibition will be opened in the following period**

1<sup>st</sup> – 2<sup>nd</sup> of December 2022 during the MetArh conference

5<sup>th</sup> – 9<sup>th</sup> of December 2022 from 10 am to 4 pm

Exhibition is organized by the Archaeological Museum in Zagreb.

### **Authors of the exhibition**

Porin Šćukanec Rezniček

Marta Rakvin

### **Coordination**

Jacqueline Balen

Project *Virtual Archaeological Landscapes of the Danube Region* (acronym: *Danube's archaeological eLandscapes*, DTP: 3-641-2.2) is implemented within Interreg Transnational Cooperation Programme VB Danube 2014-2020 and it is co-funded by the European Regional Development Fund (ERDF).

*PUBLICATIONS*



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## Thin Section Petrography, Geochemistry and Scanning Electron Microscopy of Archaeological Ceramics

PATRICK SEAN QUINN (AUTHOR)

Using over 400 colour figures of a diverse range of artefact types and archaeological periods from 50 countries worldwide, this book outlines the mineralogical, chemical and microstructural composition of ancient ceramics and provides comprehensive guidelines for their scientific study within archaeology.

Thin section petrography, geochemistry, scanning electron microscopy and X-ray diffraction are key scientific methods used to investigate the raw materials, origins and production technology of archaeological pottery, ceramic building materials, ancient refractories and plaster. Using over 400 colour figures of a diverse range of artefact types and archaeological periods from 50 countries worldwide, this book outlines the mineralogical, chemical and microstructural composition of ancient ceramics and provides comprehensive guidelines for their scientific study within archaeology. The core of the book is dedicated to the versatile approach of ceramic petrography. This is complemented by a detailed account of the principles of bulk instrumental geochemistry, as well as the SEM microanalysis and XRD characterisation of ceramics. The book is intended as a reference manual for research as well as a course text for specialist training on scientific ceramic analysis.

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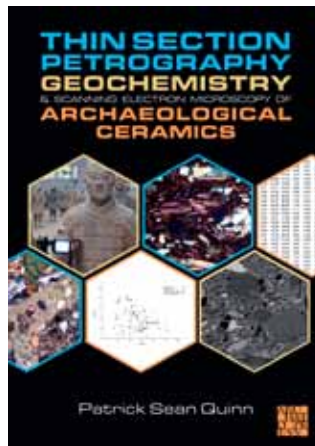
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Papers from the 1<sup>st</sup> and 2<sup>nd</sup> conference *Methodology and Archaeometry* are published in the Journal *Opuscula Archaeologica* 39/40, Department of Archaeology, Faculty of Humanities and Social Sciences of the University of Zagreb,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

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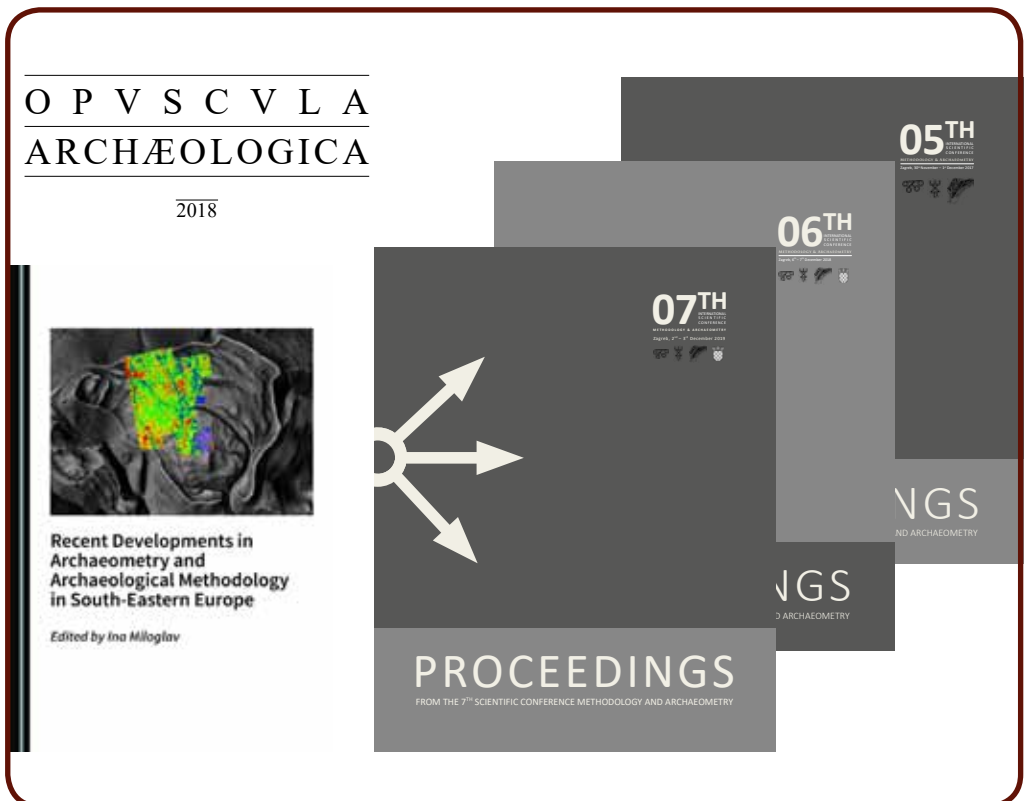
Papers from the 3<sup>rd</sup> and 4<sup>th</sup> conference *Methodology and Archaeometry* are published in a book *Recent Developments in Archaeometry and Archaeological Methodology in Southeastern Europe*, Cambridge Scholars Publishing, Cambridge, 2020.

[https://www.cambridgescholars.com/recent-developments-in-archaeometry-and-archaeological-methodology-in-south-eastern-europe?fbclid=IwAROnMmPB4m\\_ulzm6gSxWiqDi422uRsReS9Oy-0OwLrP9GyjM3R316DGhchas](https://www.cambridgescholars.com/recent-developments-in-archaeometry-and-archaeological-methodology-in-south-eastern-europe?fbclid=IwAROnMmPB4m_ulzm6gSxWiqDi422uRsReS9Oy-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 from the Faculty of Humanities and Social Sciences of the University of Zagreb (FF Open Press).

Proceedings from the 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> conference are available on:

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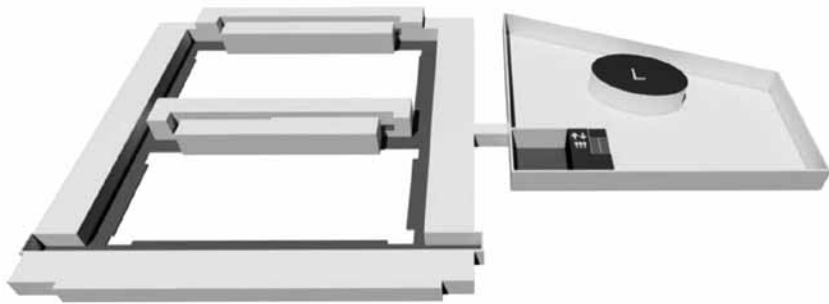




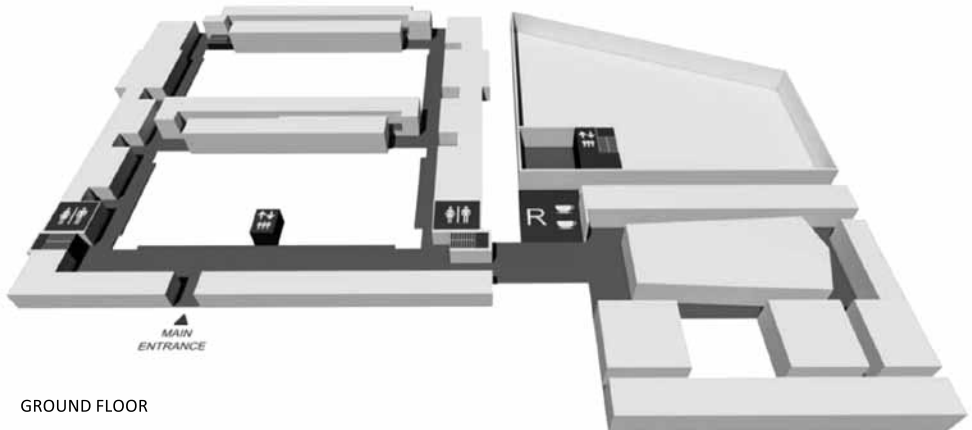
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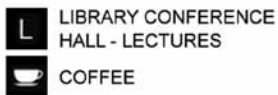
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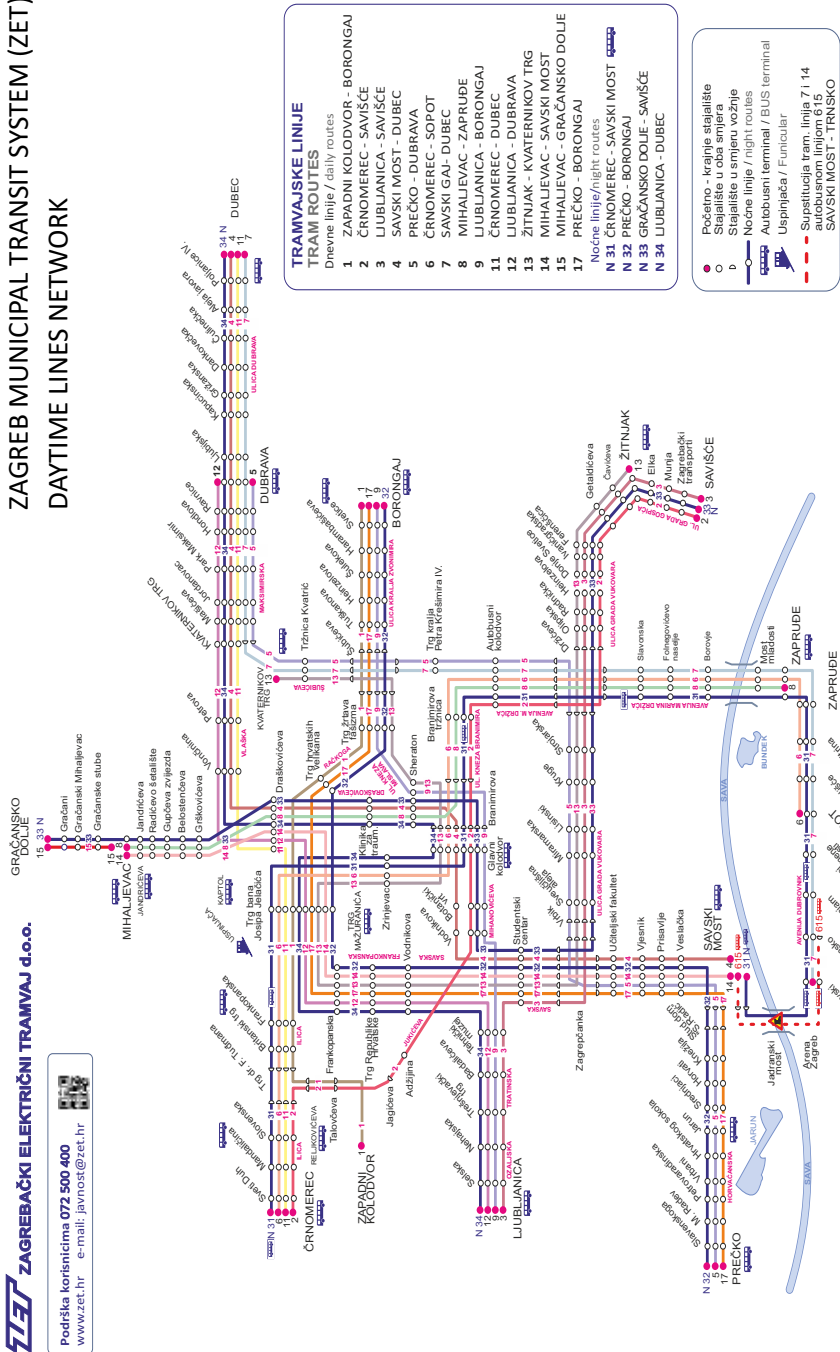
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26. 8. 2022.

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LINES 1, 3 AND 8 DO NOT OPERATE ON SATURDAY, SUNDAY OR PUBLIC HOLIDAYS









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