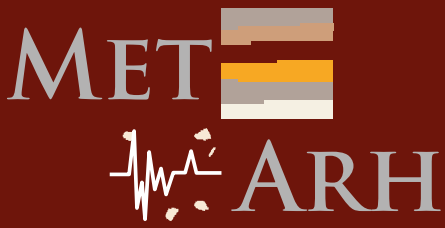


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# 07TH INTERNATIONAL SCIENTIFIC CONFERENCE

METHODOLOGY & ARCHAEOMETRY

Zagreb, 2nd – 3rd December 2019

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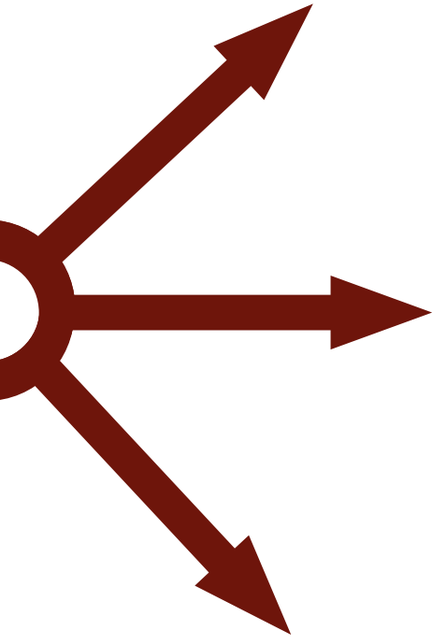

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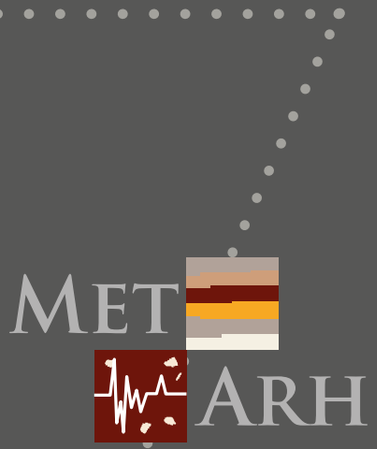




## CONFERENCE METHODOLOGY & ARCHAEOMETRY

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 the past processes and to give more objective and comprehensive picture of the past. Contemporary interpretation tools alleviate and speed the data collection and also provide us with countless possibilities of interpretation, protection and presentation of archaeological sites and the landscapes encompassing them.

### Section Archaeometry

Having in mind limited information we obtain from archaeological excavations and from the classification of archaeological material, cooperation with other scientific disciplines becomes unnecessary, to obtain as much information as possible on the conditions and the way in which the 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 a continuous cooperation of a specific expert and an archaeologist from sample collection to the final interpretation.

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*PROGRAM*

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## Presentation of Neolithic archaeological site Gorjani Kremenjača

Gorjani Kremenjača is Neolithic site in Slavonia, Croatia. It covers an area of several hectares covered with the modern agricultural fields. Magnetometry survey showed several enclosures and high concentration of objects and features.

Such archaeological site that contains only soil features is especially challenging for public presentation, yet the goal was to find a solution for efficient and effective presentation to the public. The chosen solution was to enlighten the area of one enclosure and layout of several prehistoric houses. In this poster, we are presenting the illumination of site Gorjani Kremenjača using 500 LED solar lights in September 2019.

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## *Pars pro toto, sed pars toto non est*

This paper tends to show a critical approach to archaeological research applied in studying grave goods and their contexts, in which single finds were distracted from their context and displayed or published as single finds. Show cases from Viminacium and Zadar shall be discussed, and solutions offered.

The grave number G1-15 from the Viminacium – Brest cemetery is quite outstriking. Its most famous find is a water-clock. It was molded as a reverse Drag. 37 type bowl and glazed in its upper part, obviously representing a special order by the family of the deceased. In several publications, it was published as if it was a single find. However, the whole set of grave goods from grave G1-15 includes more than fifty finds, all of them clearly indicating the cult of Venus Funeraria.

The example of the lead casket discovered in 2006 in Zadar - grave 36 (Hypo banka) was also extracted from its original context and published within an exhibition catalogue about magic and superstition. During Antiquity, the lead did possess „magic features“, but in this case, it was just a protective casket for a glass urn in which cremated remains were deposited, same as many similar caskets made of stone. Needless to say, there was no „magic“ to be recognized from any of the grave-goods from the same grave.

Although it surely is useful to make typologies of e.g. pottery, metal or glass finds discovered as grave-goods, it is even more important to look at each of the graves as a capsule that was created in a specific moment in time – designed for a person who died by those who mourned. These contexts are often left aside and neglected, but it is actually them that give a clear and broad image of a society who once created this cemetery.



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## Manufacturing antler in the Late Vučedol culture: The case study of Zók

The Vučedol culture is famous for its rich and diverse material culture, in particular, extraordinary ceramic artefacts (vessels, figurines) and metal working. Bone industry is one of its less explored aspects, although relatively rich assemblages were discovered at sites such as the eponymous Vučedol or Sarvaš. The site of Zók, in present-day Hungary (Baranya County), excavated in 1920, also yielded a rich assemblage of osseous artefacts, thus offering some data on the technology of antler manufacture in the Late Eneolithic and Early Bronze Age Vučedol culture. The collection of antler artefacts from Zók, currently stored in the National museum in Belgrade, includes axes, hammers, as well as manufacture debris, that helped in the reconstruction of chaîne opératoire. Mainly shed, collected antlers were used, and only occasionally we have antlers from killed animals. Red deer antlers prevail, with rare occurrences of roe deer antlers. Particularly interesting are traces of working in metal tools. Metal tools were occasionally used for working bone in the Eneolithic period in the South-East Europe, for examples at sites such as Sovjan in Albania, Armenochori in Greece, etc., but for the southern Carpathian basin, we have very little information regarding bone production in the earlier phases of the Eneolithic. Evidence from Zók shows that the antler production in the Late Vučedol culture was well developed and rather important activity. Unfortunately, the scarce data on the context do not allow reconstruction of a possible workshop or working area at the site.

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## γ- and UV-induced radiation defects in lime mortars and plasters studied by EPR spectroscopy

Electron Paramagnetic Resonance (EPR) spectroscopy is a well-established method of dating based on trapped charges, applied to various crystalline materials, including carbonates, bones and teeth. It provides a detailed insight into the structure of radiation defects – paramagnetic centers generated by irradiation, without the need for painstaking sample preparation, often challenging in other methods. Using EPR we studied the effect of γ radiation on lime mortars and plasters from ancient settlement Hippos in Israel, in order to analyze the process of defect generation. Analysis of the complex spectra revealed the presence of radiation-induced species, including $CO_2^-$, $NO_3^{2-}$ and organic radical. Since, as it has been recently shown, radiation defects can also be generated, instead of bleached, in pure calcite by UV radiation, we investigated also the effect of UV exposure on lime mortars. Our results can lead to a deeper understanding of generation and bleaching mechanisms of paramagnetic species, which is crucial for identifying the issues, especially related to light exposition, affecting the accuracy of age determinations in trapped-charge dating methods.

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