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## International Colloquium. Beyond Excavation. Geophysics, Aerial Photography and the Use of Drones in Eastern and South-East European Archaeology, 5–8 December 2016, Piatra-Neamț, Romania

### ABSTRACT

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The paper presents several data on the international colloquium organized in 5–8 December 2016 to the Cucuteni Eneolithic Art Museum of Piatra-Neamț (Romania) by a Romanian-German joint research team, having as topic non-invasive interdisciplinary archaeological researches, especially geophysical surveys and aerial photographs made with drones. On this occasion were presented results of the profile investigations made especially during the last years in various historical and civilization sites, by scientists of the prestigious museums, universities and academic institutions from Romania, Germany, Poland, Republic of Moldova, Ukraine, Czech Republic, Hungary and Netherlands, through 22 presentations and 4 posters. These data are also included in the volume of abstracts of the event; currently the organizers are editing the volume with the proceedings of the colloquium.

**Key words:** interdisciplinary archaeology, non-invasive surveys, geophysics prospections, aerial photography, drones, GIS, GPR, LiDAR

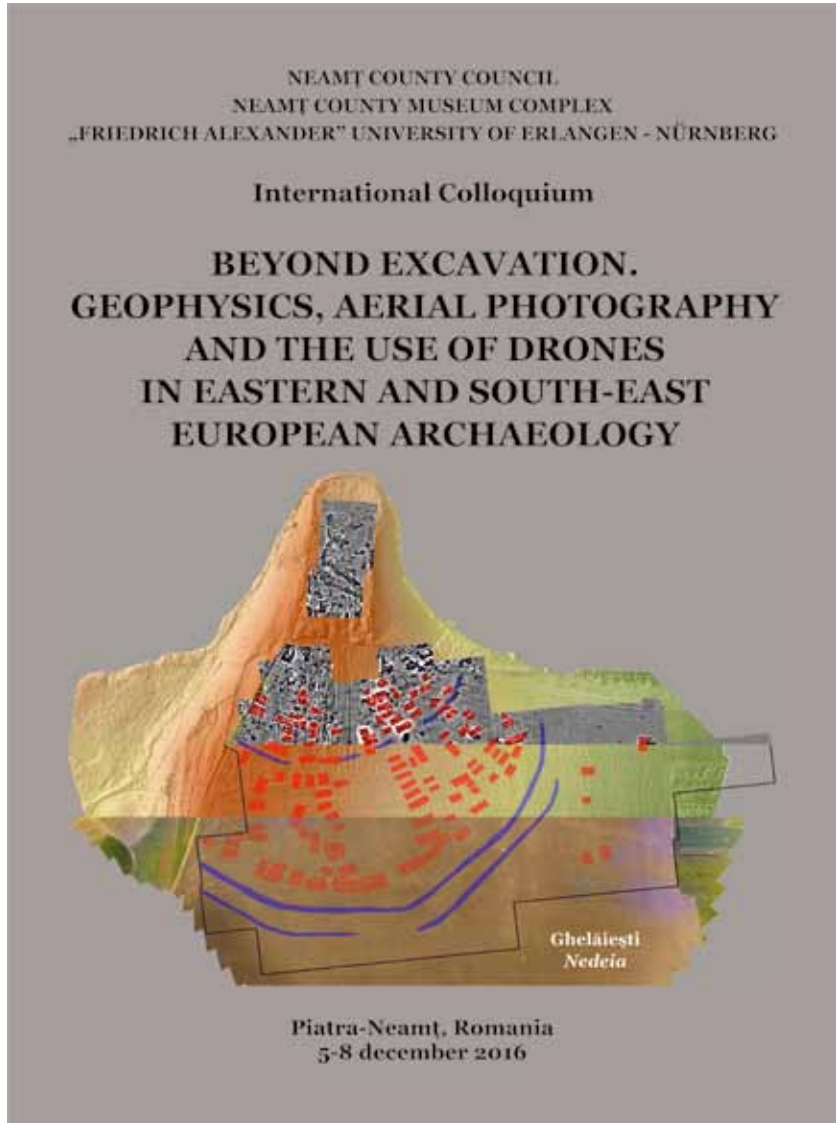
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In recent years, non-invasive interdisciplinary archaeological investigations, including geophysical surveys and aerial photographs made with drones, have become standard research methods worldwide in modern archeology, due to their many advantages.

Undertakings of this type, especially in areas where the cultural heritage – immobile and mobile, material and immaterial – was not destroyed due to the anthropic impact, represented mainly by construction, industrial and agricultural works, required the organization of a scientific manifestation, bringing together specialists in the field, from prestigious museums, universities and academic institutions, with the aim of introducing the results obtained in the scientific circuit,

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**Fig. 1.** Poster of the scientific event

exchanging experience and providing new insights into these types of investigations, depending on the technical possibilities available and the limits of the methods used.

Thus, on the basis of the existing official cooperation agreement between Neamț County Museum Complex, through the Cucuteni



**Fig. 2.** Aspects from the colloquium works

Culture International Research Center and the Cucuteni Eneolithic Art Museum of Piatra Neamț, respectively the „Friedrich Alexander” University of Erlangen-Nürnberg, through The Faculty of Philosophy and Theology and the Institute of Pre- and Proto-history in Erlangen, during 5–8 December 2016, was organized at Piatra-Neamț (Romania) the International Colloquium *Beyond Excavation. Geophysics, Aerial Photography and the Use of Drones in Eastern and South-East European Archaeology*. Besides, the collaboration between these institutions has materialized in recent years in geophysical surveys, aerial photographs made with drones and digital modeling of the terrain (GIS) for several sites belonging to the Precucuteni-Cucuteni-Tripolye cultural complex and the Middle Age in the Moldavian Subcarpathians (Romania), conducted by German-Romanian joint research team, coordinated by Prof. Dr. Doris Mischka, Dr. Carsten Mischka and Dr. Constantin Preoteasa. In this respect, it is worth mentioning that the drone owned by the „Friedrich Alexander” University of Erlangen-Nürnberg, administered on the territory of Romania by the Neamț County Museum Complex, is the first apparatus of this type officially registered in Romania – according to the legal provisions in force – exclusively for scientific research activities (not only in the field of archeology).



**Fig. 3.** Aspects from the colloquium works

The scientific event from Piatra-Neamț was attended by 56 specialists from 32 museums, universities and academic institutions from Romania, Germany, Poland, Republic of Moldova, Ukraine, Czech Republic, Hungary and Netherlands, who contributed to the colloquium with 22 presentations and 4 posters, included in a volume of abstracts published in 2016 (Mischka *et alii*, 2016); the volume of the colloquial papers is currently being published. On the last day dedicated to the event, a study visit was organized for the participants to Izvoare-*La Izvoare* and Văleni-*Cetățuia* – two famous *tell*-type Precucuteni-Cucuteni-Tripolye sites, researched multidisciplinarily over time, and recently through geophysical surveys, aerial photographs made with drones and digital terrain modeling (GIS).

During the colloquium, the results of older and newer geomagnetic researches were presented, which focused mainly on neo-eneolithic settlements belonging to the Starčevo-Criș culture (Mihailovca VII – Republic of Moldova), to Linear Pottery Culture (Bumbăta III, Găureni I and Nicolaevca V – Republic of Moldova) and especially to the Precucuteni-Cucuteni-Tripolye cultural complex (Baia, Tăcuta, Scânteia, Ghelăiești, Văleni, Adâncata and Ripiceni – Romania; Nicolaevca V, Putinești III, Stolniceni I, Trinca, Cunicea I, Cunicea II, Cunicea III and



**Fig. 4.** Contributors of the event

Cunicea IV – Republic of Moldova; Mihailovka, Viitovka, Trostyanchyk, Nebelevka, Talnoe III, Moshurov I, Talyanki, Maydanetskoe, Glybochok, Podgortsy, Chapaevka, Grebeni, Kolomishchina I and Kolomishchina II – Ukraine). Also, geophysical investigations from the late Neolithic sites of Altheim I and Altheim II (Germany), as well as from the prehistoric site of Malżyce (Poland), were also mentioned. For the Bronze Age sites were mentioned the surveys in the necropolis and the settlement of the Noua culture from Tăcuta (Romania) and Ripiceni (Romania) respectively, the settlement of the Vaty culture from Kakucs (Hungary) and the brine-exploitation related site from Tyrawa Solna 12 (Poland). Geomagnetic investigations were also carried out for the Iron Age sites belonging to the Basarabi culture from Tărtăria (Romania) or the Poieniști-Lucașeuca culture from Brănești and Ivancea (Republic of Moldova). At the same time, such investigations also focused on the ancient sites on the current territory of Romania, from Războieni

and Moigrad-Porolissum. Geomagnetic surveys were also carried out in the medieval site of Sasova (Romania) and in the modern age site from Skorczów (Poland).

Regarding the aerial photographs, during the event mentions were made on the results obtained for the sites of Malżyce, Ghelăiești, Văleni, Scânteia, Mihailovka, Viitovka, Altheim I, Altheim II, Tărtăria, Brănești, Ivancea, Războieni, Moigrad-Porolissum and Skorczów.

The GIS data (consisting of digital modeling of the terrain) refers to the sites of Ghelăiești, Văleni, Scânteia, Războieni, Moigrad-Porolissum and Sasova.

Lesser are the GPR investigations conducted at Maydanetskoe, as well as the LiDAR investigations conducted at Moigrad-Porolissum.

In some cases preliminary data previously provided by non-invasive research were subsequently confirmed by archaeological excavations.

Non-invasive interdisciplinary archaeological investigations (geophysical surveys, aerial photographs, GPR, LiDAR, GIS) provide important preliminary scientific data on the characteristics of the sites investigated, such as their location, shape, dimensions and boundaries, types of complexes within them, the organization of the living space, the absence or presence of fortification systems, the intensity of habitation from different epochs and civilizations, or the current state of conservation of the remains. They cannot, however, provide data to allow an exact delimitation of the settlements and complexes belonging to different epochs and civilizations within multilayer sites.

In the case of sites that have previously benefited from archaeological excavations, information can also be obtained on the trenches and surfaces opened and possibly some data already published can be corrected.

Non-invasive interdisciplinary archaeological research must precede the future archaeological excavations, as the preliminary results obtained – which may or may not be confirmed by the subsequent invasive investigations – allow a more effective protection, research and valorization of the cultural heritage (immobile and mobile, material and immaterial), as well as a better use of the human, material and financial resources – always limited – available to the specialists of the institutions.

## References

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