Unlocking
Sacred
Landscapes

FORTH
Institute for Mediterranean Studies

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UNLOCKING SACRED LANDSCAPES II

Digital Humanities and Ritual Space

Unlocking Sacred Landscapes Research Network

CONFERENCE PROGRAMME
AND ABSTRACTS

19-21 October 2018

GeoSat ReSearch Lab
Institute for Mediterranean Studies
Foundation for Research and Technology, Hellas (F.O.R.T.H.)
Rethymnon, Crete

CONVENORS:

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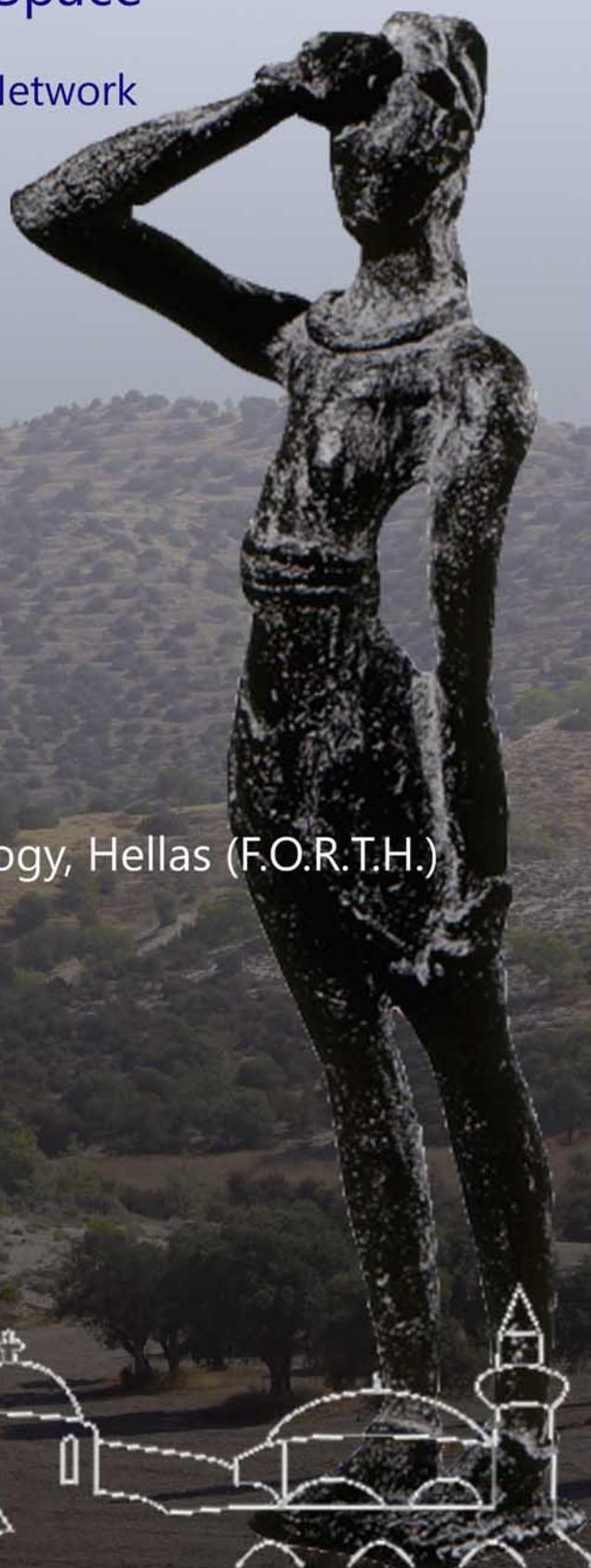
Programme

Unlocking Sacred Landscapes II:
Digital Humanities and Ritual Space

Friday, October 19

9.00-9.30: Registration and Coffee

9.30-10.00: Digital Humanities and ritual space: an introduction
Giorgos **Papantoniou,** Apostolos **Sarris,** Christine E. **Morris** and Athanasios K. **Vionis**

Session 1: Reconstructing Ritual Space

Chairperson: Giorgos **Papantoniou**

10.00-10.25: *3D digital rendering of the Cretan underworld: Skoteino Cave*
Loeta **Tyree**, Peter **Dare**, Floyd **McCoy**, Antonia **Stamos** and Jon **Frey**

10.25-10.50: *Space as the stage: understanding the sacred (?) landscape around the early Celtic hillfort of the Glauberg (Germany)*
Axel G. **Posluschny**

10.50-11.15: *Ritual space in an Early Bronze Age Sicilian hut: a distributional analysis*
Pietro M. **Militello**, Michele **Di Vincenzo** and Thea **Messina**

11.15-11.45: Coffee Break

11.45-12.10: *New perspectives on the sanctuary of Aesculapius in Nora (Sardinia): from Photogrammetry to a 3D WebGIS*
Jacopo **Bonetto**, Filippo **Carraro**, Alessandra **Marinello** and Daniele **Morabito**

12.10-12.35: *Reconstructing the sacred landscapes of Sicilian Naxos*
Jari **Pakkanen**, Maria Costanza **Lentini**, Apostolos **Sarris**, Esko **Tikkala** and Meropi **Manataki**

12.35-13.00: *Modelling Antiquity: surveying the privates areas of the Episcopal Palace, Side (Turkey)*
Moisés **Hernandez Cordero** and Andreas **Pülz**

13.00-13.25: *Virtual Reality Digitalisation of sacred spaces: balancing preservation, academic, and user needs*
Benjamin E. **Zeller**

13.30-15:00: Lunch Break

Session 2: Networks and Acoustics
Chairperson: Apostolos **Sarris**

15.00-15.25: *Recomposing the ritual landscape of Brú na Bóinne, Co. Meath, Ireland: recent results from large-scale remote sensing and excavations*
Stephen **Davis**, Clíodhna **Ní Lionáin** and Knut **Rassmann**

15.25-15.50: *Interlocking sacred landscapes of Hellenistic Northern Etruria with the Social Network Analysis*
Raffaella **Da Vela**

15.50-16.15: *From moving rituals to ritual space: a new computational approach*
Katherine A. **Crawford**

16.15-16.45: Coffee Break

16.45-17.10: *The acoustics of* contiones *or how many Romans could have heard speakers*
Kamil **Kopij** and Adam **Pilch**

17.10-17.35: *The performances in the Theatre of the Pythion at Gortyna (Crete)*
Maria Cristina **Manzetti** and Jacopo **Bonetto**

17.35-18.00: *Researching acoustics of six Orthodox churches from Late Medieval Serbia*
Zorana **Đorđević**

18.00-18.25: *Mapping Magnus: visualising saintly impact in a North Atlantic rural landscape*
Sarah J. **Gibbon** and James **Moore**

Saturday, October 20

Session 3: GIS and Sacred Landscapes

Chairperson: Athanasios K. **Vionis**

09.00-09.25: *Ritual space in an early Sicilian village: Calicantone*
Francesca **Buscemi**, Marianna **Figuera** and Anna Maria **Sammito**

09.25-09.50: *Patterns of visibility, intervisibility and invisibility at Bronze Age Apesokari (Crete)*
Sylviane **Déderix**

09.50-10.15: *Exploring the location of Mycenaean chamber tombs in the Argolid (Greece)*
Kalliopi **Efkleidou**

10.15-10.45: **Coffee Break**

10.45-11.10: *Unlocking the landscape context of the sanctuary of the Cypriot goddess at Palaepaphos*
Maria **Iacovou**

11.10-11.35: *Approaching the sacred landscape of Hellenistic Attica: a first glimpse into the Project Cult and Crisis*
Constanze **Graml** and Katharina **Vukadin**

11.35-12.00: *Quantitative approaches to sacred Roman spaces in southern coastal Latium*
Michael **Teichmann**

12.00-13.00: Poster Session

1. Sacra Tharrhica *Project: preliminary results of 3D virtual reconstruction of the Punic-Roman sacred areas of Tharros, Sardinia*
   Francesco **Belfiori**, Stefano **Floris** and Melania **Marano**
2. *Monte Rinaldo (Marche, Italy): multidisciplinary approach to the virtual reconstruction of the Roman – Hellenistic sanctuary*
   Francesco **Belfiori**, Bojana **Gruška** and Giacomo **Mancuso**
3. *Dancers in the Addaura Cave*
   Paola **Budano**
4. *Digitizing the deities: reconstructing Hellenistic cult statues and their temples with three-dimensional models*
   Ashley A. **Eckhardt**
5. *The acropolis of the Etruscan city of Marzabotto (Kainua): combining archaeological data and 3D technologies for the analysis, understanding and reconstruction of Etruscan sacred buildings*
   Bojana **Gruška** and Giacomo **Mancuso**
6. *The use of religious data in GIS: the cases of three geographically disparate regions*
   Iyad **Ladaa**
7. *The shrines of Gadir (Cádiz, Spain) as reference for navigations: using visibility analysis GIS*

Natalia **López** Sánchez, Juan Ignacio **Gómez** González and Ana María **Niveau de Villedary** y Mariñas

8. The sanctity of space: assessing the spatial organization of the churches in the southern Mani peninsula
Rebecca M. **Seifried**

13.00-14:30: Lunch Break

Session 4: Memory and Experience

Chairperson: Christine E. **Morris**

14.30-14.55: *The potential of concept mapping in the reconstruction of Late Minoan I ritual spaces: the 'Dancing Lady' from the palace at Knossos*
Ute **Günkel-Maschek**

14.55-15.20: *Modelling a sacred landscape: new directions for the study of ancient Hermione*
Giacomo **Landeschi** and Jenny **Wallensten**

15.20-15.45: *The contribution of 'total environment' reconstructions in interpreting ancient Greek experience of ritual spaces*
Efrosyni **Boutsikas**

15.45-16.15: Coffee Break

16.15-16.40: *The transformations of a place and the recording of memory in space: the case of the cultural landscape of Idomeni, Kilkis, northern Greece*
Stamatis **Chatzitoulousis**, Vlasis **Vlasidis**, Apostolos **Sarris**, Kalliopi **Efkleidou**, Eleni **Kotjabopoulou**, Nikos **Papadopoulos**, Nasos **Argyriou**, Jamie **Donati**, Meropi **Manataki** and Pedro **Trapero-Fernandez**

16.40-17.05: *Public religiousness and private religiosity in the Valley of Communities*
Rossana M. **Salerno**

17.05-17.30: *Manipulation of corporeal experience and the material world: a digital reconstruction and analysis of an Early Medieval South Asian sacred landscape*
Candis **Haak**

17.30-17.55: *Doorways and paths: spatial analysis of the monastery of Panagia Kosmosoteira in Pherai (Vira), Greece*
Maréva **U**

17.55-18.15: Conclusions and Future Plans of the Network

Dinner

Sunday, October 21

All Day Excursion to Cretan Sacred Landscapes

PAPER & POSTER ABSTRACTS

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Sacra Tharrhica Project: Preliminary Results of 3D Virtual Reconstruction of the Punic-Roman Sacred Areas of Tharros, Sardinia

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The Punic colony of Tharros, on the mid-West coast of Sardinia, was systematically excavated since 1950s. During these interventions, several sacred areas were discovered. Because of the reuse of Punic buildings in Roman Age and Late Antiquity and the consisting dismantling after the abandonment of the city in AD 1000, it is difficult to achieve a complete knowledge of these structures. The *Sacra Tharrhica* Project has been started by University of Bologna (Coordinators: A.C. Fariselli, E. Giorgi, R. Secci, M. Silani) in cooperation with University of Cagliari (Coordinator C. Del Vais) in 2017. The aim is to obtain a 3D virtual reconstruction of all temple structures, starting from a systematic architectural and archaeological study of the Punic and Roman phases. The project has firstly focused on the sacred area known as "Monumental Temple" or "Doric half-columns Temple", located in the central quarter of the site. This Punic sanctuary was probably monumentalized between the late 4th and 3rd century B.C. After the Roman conquest of the island, it was rebuilt between 1st century BC and 1st century AD.

At the present stage of research, we carried out an accurate topographical survey of the temple by means of the application of laser scanning technology, which allows to elaborate a 3D model of the buildings as well as to achieve an update 2D documentation articulated in plans – sections and cross-sectional views – able to support the analysis of the wall stratigraphy. In this direction, the virtual model in progress will represent the base for the future strategies of conservation and enhancement of the monumental heritage of Tharros as well as foster to the public fruition of the whole archaeological area.

Monte Rinaldo (Marche, Italy): Multidisciplinary Approach to the Virtual Reconstruction of the Roman – Hellenistic Sanctuary

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The site of the Roman- Hellenistic sanctuary of Monte Rinaldo (Marche Region, Italy) is a unique example of Latin type monumental sanctuary in the Adriatic Sea. Since its discovery, over 60 years ago, the site has been widely known for the terracotta decorations that adorned the main sacred buildings of the sanctuary. More recently a new research project, held by the University of Bologna (Professor E. Giorgi), the Soprintendenza Archeologia Belle Arti e Paesaggio delle Marche (Dr F. Demma) and the Municipality of Monte Rinaldo, has resumed the investigation and the excavation on the field. The aim of this poster is to present the methodology used to create the first reconstruction of the monumental phase of the sanctuary (2nd Century B.C.). A new topographical survey of the area (acquired with 3D laser scanner and aerial photogrammetry) allowed a better comprehension of the layout of the buildings, only preserved at foundations level, and to elaborate a DTM of the whole area. The entire digitization of the terracotta decorations (acquired via SfM photogrammetry) allowed to virtually restore the finds and to better understand their historical and artistic significance. Since the entire roof elements of the buildings are preserved, their study also permitted a better understanding of the elevations of the buildings and allowed to deliver hypothesis on their roofing structures, one of the most problematic topics when it comes to ancient buildings. The overall data digitization (from the DTM to the archaeological finds) allowed to use the 3D space as a virtual "construction site" to experiment and sort among different architectonical solutions, these latter fully integrated with data provided by ancient sources, similar contexts across the Mediterranean Sea, and the latest technologies.

New Perspectives on the Sanctuary of Aesculapius in Nora (Sardinia): From Photogrammetry to a 3D WebGIS

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The ritual space of the Sanctuary of Aesculapius in Nora (Sardinia) in the main focus of a recent archaeological campaign led by the Cultural Heritage Department of the University of Padova. A collaboration with 3DOM research group of the Bruno Kessler Foundation (Trento) has offered new approaches for a digital investigation of the site.

The aim of the project is mapping and visualizing the sanctuary, addressing methodologies to three different targets: the researchers, the administrators and the public users. The project is meant to offer different web tools for exploring, understanding and enjoying the site, by focusing on 3D modelling, semantic enrichment and the contextualization of digital records.

The entire site of Nora has been surveyed by a drone producing a digital model. Different outputs has been used for different scale visualizations and for different purposes: the point cloud is provided for the entire site, using Potree, an open source multi-resolution web renderer. A system of bounding boxes helps to mark single facilities inside the city, as the sanctuary itself, and at the same time it gives access to a 3D model of each building. Plugins in QGIS allow to produce extrusions of a mapped feature, setting height values extracted from the point cloud. The result is a web 3D model that can be queried like a 2D shapefile. Photogrammetric models of single ritual artefacts can be located in their own context and be displayed using 3D web renderers.

The project also deals with a spatial analysis of the so-called processional path that leads to the sanctuary, in order to assess a possible urban project meant to convey visibility to the sanctuary. The key points of the project are the metric accuracy, high resolution images, digital recording, open source software, web destination, semantic enrichment and large scale users.

The Contribution of 'Total Environment' Reconstructions in Interpreting Ancient Greek Experience of Ritual Spaces

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The paper presents a new methodological approach to the study of ancient Greek religious sites. This involves the use of Virtual Reality software, combined with astronomical reconstruction software, in order to recreate ancient Greek religious environments at the time of ritual performance. Religious architecture and spatial movement at specific times in the year and day or night, determine experience of religious spaces and, consequently, emotions and spatial memory.

The temple of Epicurean Apollo in Bassae has long been suspected to have been constructed with astronomical considerations in mind, which were aimed at affecting ancient religious experience. Through the use of this temple as a case study for the application of the proposed methodology, the paper assesses the potential of such reconstructions to inform us on ancient spatial movement, emotionality and cognition, but also on ways through which natural light may have been manipulated in order to enhance experience of religious architecture.

The paper will reveal a great deal about the way the visitor's sense of reality was articulated, in the hope to facilitate discussion on the contribution of digital technology in understanding ancient Greek ritual experience.

Dancers in the Addaura Cave

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The Addaura cave is a complex of three natural grottoes located on the northeast side of Mount Pellegrino in Palermo, Sicily. The importance of the complex is due to the presence of cave-wall engravings dated to the late Epigravettian and the Mesolithic. In one of the grottoes was found a vast and rich complex of carvings depicting men and animals. Amid a large group of bovids, wild horses and deer, there is a scene dominated by the presence of human figures: a group of characters, arranged in a circle, surrounding two central figures with their heads covered and their bodies strongly arched back. The most conflicting hypotheses have been put forward on the question of the identity of these two characters and the significance of their position inside the group. The humans in circle seem to dance: on the basis of their legs position and their arms position we can understand the dance choreography and we can make hypothesis about the rhythm. There are some elements that tell us about dance and about the social life like ornaments or movement direction. The Addaura cave is important because is the only case of prehistoric musical practice in Sicily and because is an example of the antiquity of a strong relation between music and rite. The realization of a digital animation of the Addaura dance will show the recreation of the ritual scene.

Ritual Space in an Early Sicilian Village: Calicantone

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The excavations by A. Sammito (Archaeological Service of Ragusa) and P. Militello (University of Catania) at the site of Calicantone (RG, Sicily), south-eastern Sicily, analysed a (partially known) necropolis of at least 90 rock cut tombs, and located the area of the possible village and discovered the remains of an isolated bi-apsidal building dated to the final Sicilian EBA (ca. 1600-1450 BC).

The hut has been interpreted as a funerary building devoted to the preparation of the corpse for the burial (see abstract Sammito, Messina). Its intermediate position between the village and the necropolis demonstrates its crucial role in the funerary rituals, whereas the analysis of the spatial distribution of the tombs sheds light on some places devoted to the performing of other kind of rituals, probably linked with the commemoration of the deads.

The paper presents a proposal of reconstruction of the ancient landscape in order to highlight the possible paths linking the world of the living (village) with the world of the dead (necropolis), going through a luminal space (the hut), and the location of possible ritual areas in the necropolis. This will happen through a series of digital spatial datasets and visualization tools (orthophotos, digital elevation model, vector cartography) managed by a GIS platform, resulting in a 3D movies exemplifying the actual route performed by the funerary processions.

The Transformations of a Place and the Recording of Memory in Space: The Case of the Cultural Landscape of Idomeni, Kilkis, Northern Greece

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Following recent excavations and geophysical prospection at Idomeni in the Kilkis prefecture of Northern Greece, this poster attempts to reconstruct through digital means, the tangible and intangible vestiges of historical episodes that come together to form multiple narratives of a diachronically *terra incognita* site, gradually unlocking its hidden secrets.

The digital documentation and processing, with the use of Geographical Information Systems (GIS), of the spatial remains associated with historical episodes demonstrate the ways in which space at Idomeni was used within a multifaceted, diachronic timeframe. It is a place that is constantly being transformed over the past 7000 years from a seemingly "peaceful" agricultural community during the Neolithic period to a burial ground for a still invisible Middle Byzantine settlement, and finally, as a place of violence as one of the battlefields of the First World War. The story of Idomeni has only recently been concluded as the theatre of a dramatic surge of modern refugees.

Thus, the "multilayered" identity of a mnemonic place with various representations of the past unfolds: on one hand the distant eras, such as the still unknown Neolithic and Middle Byzantine

period, and on the other, the relatively recent "traumatic" (war-related) past, which is the focus of this presentation.

Within the specific historical context of the First World War, this poster discusses the management of memories of locals and non-locals, e.g. the disappearance of entire settlements, or the emergence of new toponyms related to the protagonists and their actions during the war in the area of Idomeni and remain (?) in the memory of locals today.

From Moving Rituals to Ritual Space: A New Computational Approach

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Ritual practices permeated Roman urban life. However, the visual recognition of ritual activity within the archaeological record is largely confined to static representations such as temples, statuary, and epigraphic evidence. As a result, little attention has been paid to the presence of moving rituals that are largely invisible within the archaeological record. Using Ostia, Rome's ancient port, as a case study this paper looks at how processions associated within individual temples constructed unique ritual spaces within the ancient city. While processions are acknowledged as having regularly occurred at Ostia, the limited archaeological and literary evidence attesting to their presence or form requires an alternative approach for their study. The development of a novel computational methodology that integrates network analysis and agent-based modelling enables us to question about how the city's urban dynamics and built environment structured processional activity. These results afford new insight into the larger ritual area that was constructed by individual processional rituals at Ostia.

Interlocking Sacred Landscapes of Hellenistic Northern Etruria with Social Network Analysis

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This contribution proposes to study the evolution of the religious infrastructures of Northern Etruria in the Hellenistic time. This period shows an huge social and personal mobility, due to the process of unification of the western mediterranean under the economic and institutional egemony of Rome. The main research question is the following: did political, economic and infrastructural changes affect the sacred landscape and the religious identities of the Etruscan local communities?

As religious infrastructures are here intended public or collective cult places, including sanctuaries, temples and open spaces with religious activities. The traditional cult activities in the necropoleis and private cult practices (household-cults) are instead excluded from the present study.

A dataset of around 70 georeferencied cult places, mostly well dated within three wide periods (before 250 BC, between 250 and 150 BC and after 150 BC) is the starting point of a diachronical analysis of the sacred landscape. The cult places will be related to the connectivity network of the around 300 settlements. This two networks will be interlocked to understand the dependance/independence between settlements and cult places, e.g. if the end, the decrease or the increase of local cult activities could be relatd with changes within the connectivity network of the settlements. Following, the cult places, which are the nodes of the network of the religious infrastructures, will be analysed qualitative. The worshipped deities, the architectural forms, the topografic location, the votives will be taken in consideration as attributes of the network nodes and the forms of the cult and of the expression of religious identities will be related to the change in the role and in the position of the cult places within the network. Finally subregional pattern of behaviour will be identified and discussed.

Recomposing the Ritual Landscape of Brú na Bóinne, Co. Meath, Ireland: Recent Results from Large-scale Remote Sensing and Excavations

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Brú na Bóinne, Co. Meath is one of only two UNESCO WHS in the Republic of Ireland and can justifiably be called one of Europe's most significant prehistoric landscapes. It was inscribed in 1993 owing to the quantity and quality of megalithic art in the area, the Neolithic funerary landscape, comprising at least 41 passage tombs, and the long history of settlement in the area. Brú na Bóinne was an early adopter of lidar technology in an Irish context, leading to the identification of many potential archaeological features; however, ground-based survey has until recently been piecemeal, and excavation in recent years similarly scarce. In 2014 a new collaboration with the Romano-Germanic Komission was formed, which has so far led to three seasons of large-scale geophysical survey in the WHS, an area of c. 160 ha. As part of another collaboration with a private company (Devenish) a number of small-scale excavations have also taken place, away from the main passage tombs of Knowth and Newgrange (which for many years were the centre of excavation in the Boyne), and new, high-resolution lidar survey was commissioned. These initiatives have resulted in the beginnings of a far richer narrative for Brú na Bóinne than has existed to date. This paper will summarise this recent research and consider what this means from the perspective of the ritual composition of the Brú na Bóinne landscape.

Patterns of Visibility, Intervisibility and Invisibility at Bronze Age Apesokari (Crete)

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Three archaeological sites dating to the Prepalatial and early Protopalatial periods have been discovered so far on the hills to the south-west of the modern village of Apesokari (south-central Crete): a settlement and two circular tombs. The latest of these tombs, the so-called Tholos A, stands on a sloping bedrock ledge overlooking the valley below. The unusually inconvenient topographic setting of Tholos A makes it a *unicum* in the corpus of Minoan circular tombs, which were generally constructed on flat ground. The builders seem to have cared much about placing the tomb at this precise location, even at the risk of jeopardizing its stability. In addition, due to the limited space available, the annex rooms of Tholos A had to be built on a higher level of bedrock, resulting in a configuration attested nowhere else on the island. This paper addresses the following question: why was this particular spot so meaningful? More specifically, it relies on GIS to test the hypothesis that visibility, intervisibility and/or invisibility influenced the decision-making process that led to the construction of Tholos A on this bedrock ledge. The results of a series of visibility and movement analyses are presented to assess whether Tholos A was intentionally positioned so as to maximize its visibility or ensure (or, on the contrary, avoid) intervisibility with a series of features in the landscape.

Researching Acoustics of Six Orthodox Churches from Late Medieval Serbia

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The research of architectural heritage is primary focused on its visual aspect. Archaeoacoustic studies showed that neglecting properties of sound in the case of sacred architecture is not justified. Their multidisciplinary approach offered new perspectives in interpreting architectural heritage. Beside the fact that it has an essential significance for the perception of environment and orientation in space, throughout the cultural history sound was understood as the connection between material and spiritual plan. Therefore, it had a special place in temple architecture - the most sophisticated expression of building culture that represents the cosmological symbolism (macrocosm-microcosm analogy). This paper considers the role of digital data in addressing the relatedness of sound and sacred space, on the example of medieval Serbia. Since the Serbian Monarchy and the Orthodox Church were closely related, each medieval Serbian ruler traditionally raised at least one endowment. Due to the findings of the acoustic vessels and visual depictions on the frescos, we are aware that the aspect of sound was important, both philosophically and practically, in every building periods of medieval Serbia. In this paper we focused on the case of Moravska building period (1371-1459), as the last and the most authentic building style before Serbian medieval state collapsed under Ottoman Empire. We have researched six churches, covering both variations of the plan: (1) triconch with the compressed inscribed cross, such are churches Lazarica, Naupara and Pavlovac, and (2) triconch with the developed inscribed cross, such are Ljubostinja, Ravanica and Resava. Although our knowledge on architectural proportions, building techniques and acoustical aspirations in medieval times is very limited, due to the lack of written documents, we argue that digital data widened the field and accelerated the process of extracting recently hardly available knowledge from architectural heritage. Here we considered sound in two ways: (1) as a harmonic sound, and (2) as an impulse response. Serbian medieval culture inherited natural philosophy and building schools of Antiquity. Harmonic sound found its place in architecture through the application of musical analogy – the transposition of large intervals of ancient musical scale - such are fourth, fifth and octave - into the architectural proportions. Vitruvius wrote not only about the acoustic vessels and theatre acoustics, but he also considered *the squares and triangles of fourth and fifth*, thus connecting the musical theory and geometry. Although it is an inaudible manifestation of musical theory, it is important for understanding medieval building practice. Therefore, we showed and compared proportional analysis of architectural plans and sections of selected Moravian churches. On the other hand, impulse response is used to quantify acoustical parameters, which describe a sound field. Thus, it enables a comparison of various spaces. Acoustical response of a space depends on the space volume, its geometry and the interior surface finishes [012]. We measured impulse response *in situ* for two speaker positions - in the altar and in the south conch, corresponding to the standing positions of a priest during the liturgy, following five acoustical parameters, such are Reverberation Time (RT), Early Decay Time (EDT), Definition (D50), Clarity (C80) and Speech Transmission Index (STI). Finally, we discussed the relatedness of sound and sacral spaces, from those two different, but complementary standings, which both used digital technologies in order to expand the knowledge on the acoustical aspect of architectural heritage. This case study pointed out the benefits of multidisciplinary approach in research of architectural heritage.

Digitizing the Deities: Reconstructing Hellenistic Cult Statues and their Temples with Three-Dimensional Models

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One of the approaches to Greco-Roman art historical analysis most detrimental to the study of cult statues is the separation of such sculpture from its architectural setting. As a category of sculpture uniquely defined by its position within a temple, we must consider the two together. Current two-dimensional reconstructions of these statues and *cellas*, moreover, provide only limited information about the corresponding scale of statue and architectural frame, and offer sterile views of spaces which were intensely dynamic.

My poster presents a new methodology which reintegrates cult statues and their temples and pushes beyond representations that, quite literally, fall flat. Using the contemporary Temple of Fortuna Huiusce Diei at Rome and Artemision at Messene as case studies, I demonstrate how three-dimensional models can advance our understanding of cultic space by allowing us to digitally reconstruct it and virtually walk in an ancient worshipper's shoes.

The methodology underlying this approach is two-fold: modelling the statue itself and placing that reconstruction within a model of the temple. In the first instance, the use of photogrammetric models of statue fragments and a digital, wire-frame reconstruction of the figure help us to reconstruct the size and posture of a statue. This method is especially efficacious in cases like the statue of Artemis at Messene, where evidence is limited to literary description and small fragments. Placing this model within a digital reconstruction of its temple space further allows us to investigate not only the relative scales of statue and frame, but issues of visibility and lighting. The temples and cult statues at Rome and Messene differ dramatically in size and design, yet this poster will demonstrate how even in such varied cases, the application of a standardized digital methodology can reveal the relationship between a cult statue and its architectural surroundings and thereby enrich our understanding of ancient ritual spaces.

Exploring the Location of Mycenaean Chamber Tombs in the Argolid (Greece)

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Between 1987 and 1990 W. Cavanagh and C. Mee published a series of important papers addressing the issue of the location of Mycenaean chamber tombs in the Argolid. Following a systematic and methodologically rigid approach to the spatial distribution of chamber tombs, their studies were largely inconclusive as to the factors that defined the choice of the tombs' location within cemeteries and relative to settlements.

The present study re-visits this theme by mapping in a GIS environment all the mortuary remains published to date at a number of palatial (Mycenae, Tiryns, Midea) and non-palatial sites (Prosymna, Argos, Asine and Lerna) in the Argolid with the aim to explore the location of chamber tombs vis-à-vis known Mycenaean road-network remains and associated settlements. To this end *distance*, *mobility* and *visibility* analysis tools are used to understand whether the choice of the tombs' location followed: 1. site-specific or various universal rules inherent to the Mycenaeans' views regarding death and the treatment of their dead; 2. factors pertaining to the experiential attributes of the funerary processions that gradually became an indispensable part of the Mycenaean funerary ritual.

This is achieved by modeling least- cost paths between settlements and tombs based on algorithms that accommodate different traveling modes, frictions, costs and impediments. Subsequently, these cost-paths are evaluated based on the degree by which their route coincides with known Mycenaean road-network remains as well as on their attributes as viewpaths.

While modeling movement and visibility has become a recurring theme in GIS-based archaeological analysis, I believe that the experiential approach to understanding past landscapes that is being attempted here will provide new and innovative insights on Mycenaean death-scapes and mortuary beliefs and practices.

Mapping Magnus: Visualising Saintly Impact in a North Atlantic Rural Landscape

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This paper will present a methodological approach which allows the spatial and temporal veneration of a saint to be explored in the landscape using Saint Magnus of Orkney as a case study. Saint Magnus was martyred in Orkney in c.1117 and by 1135 had been canonised by the local bishop. His cult spread throughout the Nordic world, with his feast day being officially recognised in Norway, Iceland, Denmark and Scotland. Dedications, altars and church furnishings further demonstrate his international recognition, but aside from three Magnus dedicated churches, there is little known of his veneration within the local landscapes of Orkney. By collating a wide range of evidence (archaeological, onomastic, folkloric, historic, hagiographic) to form a dataset of Cultural Remains of veneration, the impact of Magnus on the community since his martyrdom to the present day can be mapped. By creating a means of differentiating between sources the variability and variety of evidence can be distinguished, thus allowing concentrated pockets of veneration through time to be identified as well as areas where his impact is no longer evidenced. Furthermore, by linking the Cultural Remains, 'remembered' processional and pilgrimage routes can be identified. In doing so, the impact of belief in Magnus as a saint and his continuing influence as a symbol of Orcadian identity can be visually demonstrated.

Approaching the Sacred Landscape of Hellenistic Attica: A First Glimpse into the Project *Cult and Crisis*

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This paper aims to give insight on the structure of the research project "Cult and Crisis. The Sacred Landscape of Attica and its Correlation to Political Topography". Besides the underlying research question, the first steps of mapping a specific sacred landscape with regard to a holistic approach on Hellenistic Athenian religion shall be presented.

From a political point of view, third century BCE Athens represents a shattered unity. Parts of the Athenian countryside and even the city itself were occupied by foreign Macedonian troops from time to time. Since Cleisthenic times, interrelations between the political units (*demes, trittyes*) and religious communities became institutionalised through specific cults, e.g. for the Eponymous heroes. Other cult places of superordinate relevance for the entire community, e.g. Eleusis, were also affected, as they lay within the occupied territories. With the partial inaccessibility, the fulfilment of religious duties was risked to be inhibited.

The project aims to identify potentially affected cult places by analysing their placement in relation to the military infrastructure. Apart from this GIS-based analysis of fixed sacred points, the temporal sacralisation of landscape through practised rituals (processions, races, etc.) is of high relevance as these rituals often connect several cult places and are equally compromised by the political topography. Alterations in rituals can plausibly be detected in a shift in ritual practice, be it e.g. cessation or diverting the movement routes and establishing substitute cult places. As these "solutions" are rarely referred to in written sources, an archaeological approach on the material originating from ritual practice in the potentially affected sanctuaries is intended. The diachronic statistical analysis of the votive spectrum aims to detect changes, such as in the quantity or in the types of votives.

The Acropolis of the Etruscan City of Marzabotto (Kainua): Combining Archaeological Data and 3D Technologies for the Analysis, Understanding and Reconstruction of Etruscan Sacred Buildings

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This poster presents some of the results the three-year research program: Project FIR 2013 KAINUA: *Reconstructing, Perceiving, Disseminating the Lost Reality. Transmedial Technologies for the Etruscan City of Marzabotto* (coordinated by the Chair of Etruscology of the University of Bologna), concerning the virtual reconstruction of the entire Etruscan town, based on a philological analysis of archaeological data. Marzabotto, the ancient *Kainua*, is the best-preserved example of Etruscan city, since the entire urban layout is conserved at foundation level as well as the necropolis and the acropolis. Specifically, the acropolis was excavated during the 19th century when the foundations of three temples and the remains of two altars were brought to light. A new topographical survey of the area (acquired with 3D laser scanner) allowed a better comprehension of the layout of the temples and provided the 3D models of the altars, still perfectly preserved. Furthermore, a DTM was developed using different sources of elevation data and the information from the 19th century excavations, in order to take into account the geomorphological transformations occurred from the Etruscan period and virtually restore the ancient terrain shape. The entire digitization of the building materials and the decorated roof tiles (acquired via SfM photogrammetry) provided a huge data set of information used to virtually recreate the ancient buildings. Therefore, the reconstructions here presented is the result of an analysis conducted on multiple sources all set up in a digital environment: from the morphology of the ancient terrain and the planimetric layout of the temples, to the building materials and data provided by the ancient sources.

The Potential of Concept Mapping in the Reconstruction of Late Minoan I Ritual Spaces: The 'Dancing Lady' from the Palace at Knossos

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Minoan imagery is one of our key sources for the reconstruction of ritual spaces in Bronze Age Crete. In scenes of ritual, spatial aspects are indicated by the correlation of figures, objects and landscape features, whereas works of art such as wall-paintings and figurines help us to identify buildings or sanctuary sites as particular spaces of ritual action. Minoan images and their contexts thus offer important insights into the spatial and visual structures of ritual. Even more, they provide us with the 'Minoan' vocabulary by which these structures of meaning had found expression in material and visual environments of Minoan Crete. Although semiotic-structuralist approaches have been applied on Minoan imagery in the past to unravel structures of meaning in ritual spaces, no attempt has ever been made to use digital methods to collect, structure and visualise data from both images and their contexts.

To address this lacuna I will present a new method which is based on concept mapping. Concept maps are widely used in education and business to organize and represent knowledge in the form of graphical networks of concepts and relationships. In prehistoric archaeology, such 'knowledge' is, in a sense, provided in images and in spatial configurations of archaeological assemblages, with concepts being formed by pictorial elements, objects and types of sites, linked to one another through their co-presence in the archaeological evidence.

I will show how to use concept mapping to record relations between figures and objects within images, and between figural representations and contextual features, in order to visualise material and immaterial structures of Minoan ritual spaces. The 'Dancing Lady' fresco from the palace at Knossos will serve as a case study, its fragmentary condition providing an excellent opportunity to demonstrate how concept maps can indeed help us to come to a new and deeper understanding of an important, yet lost, ritual space.

Manipulation of Corporeal Experience and the Material World: A Digital Reconstruction and Analysis of an Early Medieval South Asian Sacred Landscape

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To date, very little exploration of South Asian early medieval ritual landscapes has been done in terms of corporeal experience and materiality. Past researchers have, however, discussed elite strategies manifested in later imperial built environments that were designed with the intention of asserting ideas of kingship and ideologies. However, non-imperial and less materially visible precursors have seldom been sought. In response to this analytical void, this paper presents the findings of an exploratory analysis of corporeal and material developments of the pre- and early imperial (800-1325 CE) site of Vijayanagara (UNESCO World Heritage Site; Bellary District, Karnataka, India). The Vijayanagara landscape was initially a liminal pilgrimage site associated with death rituals, ancestor worship, and local folk cults. Gradually, it transitioned to highly Sanskritized and politicized site of interest to competing groups and agendas. Through the digitization of the site in a geographic information system, coupled with the immersive panoramic capabilities of Google Street View, and the use of thirdspace theory, new insights into the development of a religious material world and the corporeal experience of devotees have been identified. Consequently, a spectrum of group identities, local and non-local as well as non-elite and elite groups, are distinguishable in a heretofore homogenized pre- and early imperial history. These groups are traceable through their distinct ritual and social needs that are manifested in the creation, manipulation, and negotiation of space and intended devotee corporeal experience. By examining the development of the landscape and identifying when and where and how space was altered, the palimpsestual nature of an early medieval South Asian sacred landscape has been made visible through digital historical phenomenological investigation.

Modelling Antiquity: Surveying the Private Areas of the Episcopal Palace, Side (Turkey)

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Nowadays the use of digital techniques is often applied by archaeologist on the field to get quick and reliable 3D surveys for their researches. 3D Models and reconstructions of their areas of work is a primary goal when using these techniques. The aim of this paper is to show the works undertaken during the seasons 2016 and 2018 on the private areas of the bishop's residence of the Episcopal Palace in the ancient city of Side, Turkey. We will focus on the data acquisition process, accuracy of the survey, errors and solutions and the workflow-process of the data. Moreover, the paper will explore new solutions for the merge of different data captured on the two seasons as well as applications for the study of the remains surveyed. At the end, probable applications of the data created with such methods, as elevations and plans, 3D models and orthophotos that help to formulate new hypothesis/theories of the ritual and non-ritual areas covered will be shown. We want to present a useful workflow to add surveys previously done on the same site together with current surveys with a maximum level of accuracy. Total Station survey, RTK-GPS survey, Geophysics (GPR) and Structure from Motion (SfM) are among the techniques used to compile the information later exported into CAD and GIS environment.

Unlocking the Landscape Context of the Sanctuary of the Cypriot Goddess at Palaepaphos

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The sanctuary of the Cypriot Aphrodite at Palaepaphos is probably the most well-known ancient monument of Cyprus. It has also been a victim of the fame it acquired under the Ptolemies and the Romans, who deprived it of its primary role as the cult centre of the autonomous polity of Ancient Paphos. Today the recovery of the sanctuary's original identity depends on the recovery of the almost invisible landscape of its founding polity, from the second millennium BC, when Ancient Paphos was first established, to the end of the Cypro-Classical period, when it lost its political status.

In 2002-2003, an all-digital project, based on multi-sensor geophysical surveys (Ground Penetrating Radar; Magnetic prospection; Electrical soil resistance) and the development of a GIS linked to an entity-related geo-database was implemented. This was followed in 2006 by the initiation of the *Palaepaphos Urban Landscape Project* (*PULP*). Using advanced documentation and imaging technologies (Global Satellite units, total stations and RGB digital cameras mounted to UAVs) as well as geospatial analyses (viewshed, least-cost path, proximities, site catchment analysis, etc.), *PULP* has been building a diachronic model of the expanding and contracting urban structure of the ancient polity and its associated settlement pattern in the hinterland.

An initial site analysis of the Paphos hydrological basin at the macro-scale revealed that Ancient Paphos, despite its current distance from the coast, was established as a gateway to the sea around 1700 BC. The megalithic temenos, on the other hand, was not erected until half a millennium later (circa 1200 BC). The analysis of the urban structure of the polity during the Late Bronze Age has unlocked the significance of the spatial positioning of the sanctuary: it was apparently placed in relation to the long-lost port lagoon, which was the reason for the foundation of Ancient Paphos in the first place.

The Acoustics of *Contiones* or How Many Romans Could Have Heard Speakers

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Forum Romanum was the political and religious centre of the Roman Empire as well as a primary place for Roman social memory. Not surprisingly it also played the key-role as one of the most important Roman ritual spaces. One of rituals performed there were the so-called *contiones*, during which important politicians discusses the laws proposed at the People's Assemblies and presented their opinions to the Roman people. Some scholars believe that *contiones* played the key-role for determining the fate of a proposed law. If a proponent noticed that the people participating in *contiones* are not in favour of the law, he withdrew it to avoid a severe prestige defeat at the People's Assembly. *Contiones* can therefore be considered as one of central institutions of the Roman Republic. At the same time they were also the key ritual for constituting the Roman liberty (or *libertas*).

Considering the role *contiones* played in the political life of the Roman Republic we can ask how many Romans participated in them. In our paper we would like to present results of acoustic analysis of two places at the Forum Romanum that we know were platforms for speakers at *contiones*: the *Rostra* and the podium of the Temple of Castor and Pollux. The main goal of our study was to establish the maximum number of participants that could have heard speeches. To do that we used a 3D model of Forum Romanum considering not only the geometry but also the acoustic parameters of materials used to construct the rostra and adjacent constructions. Based on the sound power level of a speaker and possible noise sources, on which the recipients were exposed to, we established areas where speeches could have been heard and understood. This in turn allowed us to estimate the maximum number of recipients.

The Use of Religious Data in GIS: The Cases of Three Geographically Disparate Regions

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Geographic Information Systems (GISs) and their application in Humanities is illustrated in this poster. Especially, their uses in the field of theology and theological data. Three geographic databases were created for areas in the Mediterranean. The regions are:

- The Holy Land and the regions of the Patriarchate of Jerusalem
- The monasteries of the Pappikion mountain in Greece
- The monasteries of mount Athos

The databases serve as sources for the extraction of various information in a number of thematic maps. Furthermore, information can be presented on interactive maps' applications, which in turn will provide the user with theological information. Last, the data can be combined in one database for information about sacred landscapes.

The regions were chosen for their special characteristics. The region of the patriarchate of Jerusalem was chosen for the discrepancy of the political borders with the ecclesiastical borders. The second region, the Pappikion mountain, presents the particularity of being known for its past monastic life from related texts, that also leads to the geographic location. This clarifies, with the assistance of GIS, the reason for building these monasteries on that specific location.

The third and last region, Holy Mount Athos, was chosen to show how GIS can be used to combine theological data with touristic data. Mount Athos is known for its spirituality. At the same time, it is a destination for tourists as well. Hence, by using theological data and touristic data, a thematic map, and interactive map with several information can be created.

Modelling a Sacred Landscape: New Directions for the Study of Ancient Hermione

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Detecting visual patterns and setting up a more 'humanized' GIS has always been a challenging task in the study of ancient space. Various attempts to take advantage of digital technology to better close in on human perception of spatial contexts in antiquity have been performed and recent advances, in terms of hardware and software solutions, now allow archaeologists to re-discuss and re-evaluate approaches to landscape and site analysis.

A research collaboration between the Swedish Institute at Athens, the Ephorate of Antiquities of the Argolid and Lund University has created an advanced 3D GIS platform with the purpose of collecting and analysing different datasets related to the ancient city of Hermione. Part of this information can now be used as a basis to perform what can be defined as a 'simulation of the past'. The symbolic significance of the main sacred area of the city, the sanctuary of Demeter Chthonia, and its religious topography can be assessed with formal methods of enquiry that could include GIS-based line-of-sight analysis, least-cost-path and full-3D space syntax.

This paper presents the platform's possibilities for approaching the Demeter sanctuary and its cults. Scholarly debate has focused on Demeter's main festival and its peculiar sacrifice. Less attention has been given the fact that other cults of the sanctuary create a veritable deathscape, including two cults of Hades, an underworld entrance and the "Acherusian lake". This sanctuary lay in the midst of the city, or just outside the walls. Many Hermionans would have passed it daily and thus have lived particularly close to the Underworld. Can digital technology, combined with approaches like phenomenology and cognitive psychology further our understanding of Chthonia's cult and its influence on daily life and citizen identity in ancient Hermione?

The Shrines of Gadir (Cádiz, Spain) as Reference for Navigations: Using Visibility Analysis GIS

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Cadiz archaeology has tried to clarify for years the location of the coastal shrines devoted to the three most influential divinities of the Tyrian Pantheon cited by classical sources.

According to Strabo, *Gadir* housed three temples (*III, 5, 3*). The shrine consecrated to *Melqart,* was erected at the southernmost point of the island. This shrine was later reconverted into the Temple of Hercules Gaditanus, enjoying wide fame throughout the Mediterranean.

A second shrine was dedicated to the Phoenician goddess *Astarté*, who became Venus Marina in Roman times. According to Pliny (*NH, IV, 120*) it was located on a little island consecrated to Aphrodite, possibly situated near the current Santa Catalina Castle.

Finally, historiography locates the shrine of *Cronos* (*NH, IV, 120*), heir of the Phoenician *Baal Hammon* in the area of the San Sebastian Castle, where it was discovered a proto-Corinthian capital.

At present, classical references has been reinforced by the *Reschef* of Egyptian iconography found in the Sancti Petri channel (next to the *Melqart* shrine); by several votive and ritual material discovered at the Punta del Nao (reef attached to the Santa Catalina Castle); and by the structures found on the island of San Sebastian.

Our aim is to study for the first time the spatial relationship between the three coastlines shrines of *Gadir*, since their geographic locations were chosen in a premeditated way so that these buildings could fulfil their multiple functions. Among them, we are interested in their function as a guide for navigation, where the visibility factor plays a relevant role. This aspect must be also studied by itself under the concept of Maritime Cultural Landscape. Our purpose is to use multidisciplinary methods to approach to a subject that began to be studied at the beginning of the 20th century and that still remains open.

The Performances in the Theatre of the Pythion at Gortyna (Crete)

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The location of the smaller Roman theatre of Gortyna in Crete, exactly at the back of the temple dedicated to Apollo Pythios, suggests a clear correlation of this monument with religious rituals. We may suppose that the theatre was used in particular during the *ludi Apollinares* (*Pythia*), namely the games and festival dedicated to the god Apollo and held for the first time in Rome in 212 BC, or during the iso-Olympic agones witnessed by the epigraphic sources of imperial age. Generally, the religious *ludi* at the Roman times consists in dramatic performances and we know from Varro that especially during the games dedicated to Apollo the *praetextae* (tragedies with Roman topic) were performed. However, we have to consider also the possibility that the small theatre of Gortyna could have housed civic ceremonies or other activities related to the life of the *Koinon ton Kreton*, the federal assembly of all the Cretan cities which had its seat during the imperial times just in the This paper aims to verify the typology of performance that could take place in the theatre of the Pythion, namely if it was more suitable for music or speech, through virtual acoustics analysis.

The recent archaeological campaigns conducted by the University of Padua in the area of the theatre have provided a large amount of data which has enabled the archaeologists to hypothesize its architectural structure. A 3D model representing the possible original aspect of the theatre has been made and acoustics parameters related to the energy of the sound and to its quality have been considered during the virtual acoustics analysis. According to the resulting values of the afore-mentioned parameters, we can assume if the acoustics quality of the theatre enables a good comprehension of the speech or a finest listening of music.

Ritual Space in an Early Bronze Age Sicilian Hut: A Distributional Analysis

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The excavations by A. Sammito (Archaeological Service of Ragusa) and P. Militello (University of Catania) at the site of Calicantone (RG, Sicily), south-eastern Sicily, discovered the remains of a bi-apsidal building dated to the final Sicilian EBA (ca. 1600-1450 BC). The hut, located between the area of the contemporary village and the its necropolis of rock cut tombs, is of considerable size (ca.5x12,5 m), such as a few others known from EBA Sicily (e.g. the building from the eponymous Castelluccio site). It was destroyed by an abrupt event (earthquake or a human attack) and yielded a large amount of findings, including both cult and luxury objects (clay horns, idol, necklaces) and mundane ones, such weaving implements, stone tools, small, middle and many large clay containers (*pithois, dolia*). Surprisingly excavations recovered the skeletons of many individuals, apparently not all victims of the destruction, leaving open the problem of the function of the hut.

The paper will present the result of a spatial analysis of distributional patterns of the findings through a statistic multivariate approach, in order to understand the use of space inside the hut. The cluster analysis is an objective method to reveal the existence of associations not immediately visible at naked eye, identifying hidden links among objects. The intra-site analysis, along with a functional one, suggests that the building was a communal house, probably devoted to the preparation of the corpse for the burial, where not only the treatment of the body was performed, but also the preparation of textiles and other items for the funerary ritual.

Reconstructing the Sacred Landscapes of Sicilian Naxos

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Naxos is the earliest Greek settlement of Sicily and the seat of the Altar of Apollo Archegetes respected by all poleis of the island. The ongoing project on the urban landscape of the city has over the years produced several new digital reconstructions of the colony's simple non-peripteral temples with highly decorative roofs and new information on the possible sacred character of the re-foundation of Naxos in the early Classical period.

Three Archaic sacred buildings of Sicilian Naxos are used to demonstrate three different approaches into architectural reconstruction, and they also reflect changes in digital documentation strategies over the past ten years. Tempietto H is a small shrine outside the city boundaries and the site is currently inaccessible, so the reconstruction is based solely on the excavation documentation and preserved roof terracottas. Half of Tempietto C is currently visible and it was documented in 2015 using three-dimensional line-drawing with total stations and photogrammetry; the western invisible half was surveyed with Ground Penetrating Radar. Tempio B is the largest sacred structure of Naxos in the south-western corner of the city. The sanctuary has been recorded with handheld digital photography in 2015 and aerial photography in 2017. Both sets can be used in conjunction to create a combined three-dimensional model of the sanctuary. The roof terracottas of the temple have also been modelled using photogrammetry. A new regular city grid was established c. 470 BC and a rectangular base was placed in the south-east corner of every crossroad. These bases were the starting point of laying out the rectangular plan of Naxos, and interpreting them as altars converts the whole urban plan into a new sacred landscape.

Space as the Stage: Understanding the Sacred (?) Landscape around the Early Celtic Hillfort of the Glauberg (Germany)

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The Early Celtic hillfort of the Glauberg in Central Germany (some 40 km northeast of Frankfurt) is mainly known for its rich burials and especially for the remains of at least four sandstone statues of Celtic chiefs, warriors, and heroes. Despite a long history of research at that place the basis for the wealth of the place (i.e. of the people buried here) is still under discussion, as is the meaning of the settlement site as part of its surrounding landscape.

A ditch system stretching southwest from the main burial mound has been interpreted as "procession avenue" but may in fact be part of a calendar building that could have been used for ritual ceremonies – and it seems highly likely that a person or a group of persons that was able to 'read the moon and the sun' was something special in its society, equipped with power and status that made the Glauberg special in its landscape.

A number of other hints show the presence of ritual practices, like potential building sacrifices in a ditch adjacent to the ditch that surrounded the main burial mound, or like fireplaces under a later phase of one of the ramparts which could be interpreted as ceremonial fires.

The paper will discuss these features and will then focus on investigations that put the place into its landscape context, including remote sensing approaches (geophysics and LiDAR) and new excavations but also including viewshed analyses which define the surrounding area based on the Glauberg itself and other burial mounds on the mountains in its vicinity.

Public Religiousness and Private Religiosity in the Valley of Communities

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The study of "other" cultures has often been characterized by what we might call "area trademarks" (Mauss 1950). In analysis of the study, two forms of "religiosity" and social action by social actors within a socio-cultural space in the territory of Palermo. The case of the "Festino" – "the big feast" and the "festinicchi" – "a little feast" - that wind along the streets of the city. The presence and specific construction of the "devotional altars" inside the alleys - for the recurrent festivities, built in the alleys, in the streets, in private houses - in front of them, symbol of a specific delimitation of the space and actions implemented by the actors social networks that are part of it.

The first difference to be affixed is that which is imposed as a form of celebration or private religiosity within the houses, the presence of specific votive altars - dedicated to a saint or to more saints - on display through the opening of the door of the houses present in the alley. The second makes clear the limit between what we identify as "private" and everything else that we etymologically call "public" within the specific term "religiosity" differentiating it clearly from "religion" and "religious sense".

The survey conducted with socio-ethno-qualitative method traces a path of territorial change through the presence of social actors who aim to implement new forms of alley community. Interview, face to face, analysed in to software NVivo. Moreover, family ties, the sense of territorial belonging - cultural identity are manifested in evident ways through forms of inter-religious dialogue that take shape in the construction of votive altars - addressed not only to all the inhabitants of the alley but also to those who profess other religion and living on the opposite side of the road leading to the alley. The sense of community of alley as a synonym of belonging and of social identity through the ritual transformation of the territory - the sense of values that are built over time but which remain in the cultural heritage of the territory itself, is of primary interest in analysis.

What is striking is the prevalence of relationships on the individuality – a primacy of society that Leenhardt synthesizes with the expression one is a fraction of two (Leenhardt 1942). The opposition between an idea of society based on solidarity and one on domination that results in violence, in a world where everyone pursues only their own interests constitutes a "geographic dichotomy" within one of the four mandates placed in analysis. As Clifford Geertz states, man often remains entangled in the network of symbols he himself created (Geertz 1998).

The Sanctity of Space: Assessing the Spatial Organisation of the Churches in the Southern Mani Peninsula

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The southern Mani Peninsula in the Peloponnese, Greece – an area totaling about 300 square kilometres – is home to nearly 700 Orthodox Christian churches dating from the Early Byzantine through Modern periods. This rich ecclesiastical heritage has been the subject of many studies over the course of the 20th century, particularly focused on church construction, systems of patronage, and religious artisanship. Some have argued that the locations of the churches might have held symbolic significance for the region's inhabitants, especially with resect to domestic and productive spaces. However, a regional-scale spatial analysis of the religious infrastructure of Mani has yet to be carried out, in part due to the lack of access to spatial data concerning the churches' locations.

This paper presents the results of a spatial analysis of church locations in the southern Mani Peninsula, the goal of which is to investigate the possible role that churches played in the shaping of community identity and in the changing conceptualization of the region's religious landscape over time. Data is drawn from original research conducted in 2014–2016 to document and map the region's standing architectural heritage. As part of this work, and through the analysis of remotely sensed imagery, field visits, and the study of published materials, nearly 700 churches were mapped. The locations of these monuments varied widely: while most were situated in central areas of a settlement, others were positioned around the edges of occupied areas, and still others were located in unoccupied zones (*exoklisia*). These categories formed the basis for a spatial and statistical analysis of the church locations, the results of which point to dramatic transformations in the religious landscape of Mani over the course of the Byzantine through Modern periods.

Quantitative Approaches to Sacred Roman Spaces in Southern Coastal Latium

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Southern coastal Latium is situated in the heartland of central Italy and in the immediate vicinity of Rome. Numerous sanctuaries were situated within this area. While some of them were primarily related to local cults, other like the sanctuary of Diana at Lake Nemi and the sanctuary of Juno at Lanuvium were of over-regional importance and were places of common identity with a political function.

The paper aims to discuss the role of sacred spaces as parts of their cultural landscape. Therefore spatial analyses were conducted to assess the role of sanctuaries among other environmental and cultural variables for the choice of building sites. Did a good access to a sanctuary matter for the location of a Roman villa or were other factors much more important? Did the famous over-regional sanctuaries have a stronger impact on the settlement patterns in their vicinity than local sanctuaries?

A further question is related to the degree of visibility of sanctuaries. Therefore, Viewshed Analyses have been conducted to improve our understanding of inter-visibility between sanctuaries and other significant landscape elements as towns, roads and villas. The research period reaches from the late 4th century BC to the early 4th century AD.

3D Digital Rendering of the Cretan Underworld: Skoteino Cave

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The dark underground of caves presents not only mysterious —and thus often ritual —space but also the setting where digital imaging can provide the technology for mapping subterranean networks for archaeological and geological studies. There are numerous reasons for societal use of underground spaces, including habitation, protection, refuge, storage, and ceremonial, but not without risks from darkness masking precipitous topography, from toxic atmospheric conditions especially in poorly ventilated spaces where open-fire torches are used for illumination, from vigorous sometimes catastrophic subsurface-water motion in limestone terrains, as well as from tectonic activity collapsing caves.

These environmental factors leave their mark in cave morphology and sediments, as does anthropogenic use. And it is in this setting where spatial analyses via 3D mapping using digital technologies can provide a new (for caves in Greece) and significant method for cave research. This was attempted in 2000-2015 at Skoteino Cave in central Crete. For the past 4000 years, or more, this cave has seen occupation for all of the reasons (and concomitant risks) noted previously, including dance performances during the past two decades. Graffiti here announces cave exploration during Venetian times.

The significance of this cave and its morphological characteristics that allowed this use called for digital scanning technologies after conventional light-based mapping schemes proved difficult and dangerous. An additional attribute allowing success in testing and using this technology was that the main subterranean network was represented by one major cave with only minor small subsidiary caves. Scans (in sharp focus) of Skoteino, a cave that is dramatically losing its physical information, provide documentation for site preservation and heritage management in addition to reproducing, interpreting, and disseminating the archaeological, geologic, and spatial record.

Doorways and Paths: Spatial Analysis of the Monastery of Panagia Kosmosoteira in Pherai (Vira), Greece

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A coenobitic monastery is a place of worship, habitation and economic activity. Its space is delineated by an enclosure to which the monastic buildings lean, while the main church occupies the free space in the center of the complex. The monastic space is structured by several thresholds, doorways and passageways that determine the different paths towards the monastery and within it. Through an interdisciplinary approach, this paper proposes to examine the layout and uses of the entrance spaces, then the paths inaugurated, in a Byzantine monastery.

The monastery of Panagia Kosmosoteira is a relevant case study to the analysis of liminal spaces. Founded in 1151/2 by the *Sebastokrator* Isaac Komnenos, son of Emperor Alexis I Komnenos (1081-1118), the monastery is located at Pherai (or Vira), at 25 km east of Alexandropouli, Thrace. The *typikon* written by the founder contains much information on the life of the community, but also on the site and its area. The site location is strategic, especially because of its proximity to the Evros River and Via Egnatia. According to the *typikon*, the monastery was bounded by an enclosure, reinforced with rectangular towers. It contained a *katholikon*, a refectory, a sacristy, a library, cells, storage rooms, *etc*. Only the *katholikon* and some sections of the fortification wall remain today. Thanks to textual, material and environmental data, it is, however, possible to propose a reconstruction of the monastery and to determine the layout of the liminal places and paths that organize the space.

Through the study of the built and natural environment, then religious and social practices, this paper aims to present a reconstruction of the Kosmosoteira monastery and its doorways. Spatial analysis with Geographic Information Systems (GIS) allows to use the data and to model the advanced hypotheses.

Virtual Reality Digitalisation of Sacred Spaces: Balancing Preservation, Academic and User Needs

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This paper looks to digitalisation as a form of cultural heritage management within the context of a living religious space with a variety of users. In particular, I consider the use of 360° virtual reality platforms as means of both preserving and supporting multiple digital users of ritual spaces. I frame the discussion in terms of the sometimes-conflicting needs of different users such as preservationists, congregants, tourists, and the general public. This paper uses as a case study the author's ongoing digitalisation work at Chicago's St. Stanislaus Kosta Parish and the Sanctuary of the Divine Mercy, which in the late 19th century was the largest Roman Catholic parish in the United States, but by the mid-20th century nearly demolished to build a motorway. Using my experience in leading a digital humanities digitalisation project of this and several other of Chicago's ritual spaces, the paper argues that projects involving virtual reality digitalisation of religious sites must balance *access* and *preservation*, within the context of three distinct types of users: the digital tourist, the digital pilgrim, and the digital student. I argue that while the technology is nascent, consumer- and "prosumer"-level 360° virtual reality technology offers a simple and accessible manner of providing a digital foundation of ritual spaces that can later be extended through higher resolution photogrammetry, serving all three populations within the context of the digitalisation and virtual reconstruction of ritual space and its material assemblages.