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# Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

**- Απρίλιος 2017 -**

**Ο ευγενής άνθρωπος δίνει αξιοπρέπεια σ' όλες τις πράξεις.  
(Πλούταρχος)**

# Newsletter of the Hellenic Society of Archaeometry

**- April 2017 -**

**Nr. 193**

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## **ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS**

### **WORKSHOP: RITUALIZING FUNERARY PRACTICES IN THE PREHISTORIC AEGEAN: ACTS OF TRANSFORMING AND VIEWING THE HUMAN BODY, APRIL 6, 2017, RESEARCH DISSEMINATION CENTER, AUTH, CONFERENCE ROOM III**

The Department of Archaeology of the Aristotle University of Thessaloniki is organizing in collaboration with the Institute of Classical Archaeology of the University of Heidelberg, a one-day Workshop with the title: Ritualizing Funerary Practices in the Prehistoric Aegean: acts of transforming and viewing the human body. The Workshop will take place on April 6, 2017, at the Research Dissemination Center, AUTH, Conference Room III.

For more information, please visit the website:

<http://www.hist.auth.gr/el/content/%CE%B7%CE%BC%CE%B5%CF%81%CE%AF%CE%B4%CE%B1-ritualizing-funerary-practices-prehistoric-aegean-06042017>

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## **WORKSHOP: RECONSTRUCTING SUBSISTENCE USING THE BAYESIAN MODEL FRUITS, CARDIFF UNIVERSITY, 12-13 JUNE, 2017**

Applications for the workshop “Reconstructing subsistence using the Bayesian model FRUITS” are now open. The workshop will be held at Cardiff University (12-13 June, 2017).

There is no participation fee, however, those interested in participating must send an email to Richard Madgwick ([MadgwickRD3@cardiff.ac.uk](mailto:MadgwickRD3@cardiff.ac.uk)) before the 15th of May. In their email the submitters must specify if they want to propose a case study for discussion. Space at the workshop is limited to 25 participants and is available on a first come, first served basis.

During the workshop a new version of FRUITS (3.0) will be presented which introduces several novel capabilities. No previous experience using FRUITS is required. However, attendees must be familiar in general with diet reconstruction from isotopic data and have a basic understanding of the mechanisms of isotopic signal transfer from diet to consumers. The latter is essentially the answer to the question: “what is the exact dietary source of a consumer isotopic signal?”. FRUITS is flexible and allows users to implement different model instances that reflect novel research within dietary physiology and results from controlled feeding experiments.

FRUITS is available for free download from SourceForge:  
<https://sourceforge.net/projects/fruits/>

Further information on FRUITS available at the YouTube channel:  
<https://www.youtube.com/channel/UCxNWBKevwf4QprY7orl0q1Q>

### **Workshop topics:**

- Installing FRUITS in different platforms (Windows, Mac, and Linux)
- Designing a FRUITS model instance to fit a specific problem (dietary and non-dietary applications)
- Model feasibility (tests prior to implementation)
- Importing data from datasheets. Saving, loading, and sharing FRUITS model instances
- Defining model uncertainties for different parameters (including target/consumer uncertainty)
- Some non-dietary examples (e.g. geology or environmental research)
- Defining food groups and their nutritional and caloric compositions
- Dietary examples (simple C & N models, models with multiple proxies, concentration vs. non-concentration dependent models, routed vs. scrambled models)
- Reconstructing pottery use from isotopic signals in fatty acids
- Using FRUITS estimates to correct radiocarbon dates in samples exhibiting radiocarbon reservoir effects

- Interpreting multiple model outputs (total caloric contributions, nutrient contributions, elemental contributions)
- Adding prior archaeological and physiological information (assigning prior to different model estimates or parameters)
- Assigning prior relationships of equality or inequality among model parameters and defining prior strength
- Advanced dietary modelling (e.g. constraints on nutrient intakes, handling weighted contributions from protein and other nutrients, diet-to-consumer isotopic offsets dependent on protein quality or levels of protein intake)
- Handling FRUITS graphical outputs (raster and vector images, file types, exporting data points)
- Assessing model robustness and convergence
- FRUITS and R
- FRUITS and OpenBUGS

**Organisers:**

Richard Madgwick (Cardiff University)

Ricardo Fernandes (Kiel & Cambridge Universities)

**‘HUMAN-ENVIRONMENT DYNAMICS IN  
THE PELOPONNESE AND BEYOND: IDEAS –  
METHODS – RESULTS’, ATHENS,  
THURSDAY-SATURDAY, 6-8 APRIL, 2017**

The PELOPS group in cooperation with the Swedish Institute at Athens and the American School of Classical Studies at Athens cordially invites you to attend a conference on human- environment dynamics in the Peloponnese and beyond. The conference is a collaborative effort among members of the PELOPS (Past Environments and Landscapes of Peloponnesian Societies) group, which is an interdisciplinary group of scholars with an ongoing engagement in human-environment interaction in the Peloponnese from archaeology, history, environmental and climate reconstructions.

The primary aim of the conference is to make a contribution to the ongoing debate concerning the form and content of interdisciplinary research on human-environment dynamics in past societies from prehistory to Late Antiquity. The conference will be an arena for innovative ideas, integrated methods and lessons learnt from current interdisciplinary projects in the Peloponnese and beyond. In answer to the open call for more collaborative research efforts, the conference will host 17 lectures by members of the PELOPS group and invited speakers, presenting well integrated accounts of human-environment interactions in past societies.

The conference will open on Thursday, 6 April, 2017, 7 pm at the Acropolis museum, with a lecture by Michael GIVEN (University of Glasgow), ‘Conviviality of the land: towards a new academic ecology’, followed by a welcome reception at the Swedish Institute at Athens.

The conference will thereafter take place at the American School of Classical Studies at Athens, 7-8 April, 9 am-18 pm.

For further information and a full conference programme, see <http://www.sia.gr/topics/2017/03/13/international-conference-human-environment-dynamics-peloponnese-beyond-ideas-methods-results/>

Best wishes

Erika Weiberg on behalf of the PELOPS group

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# **INTERNATIONAL WORKSHOP “CULTURAL HERITAGE FACING CLIMATE CHANGE: EXPERIENCES AND IDEAS FOR RESILIENCE AND ADAPTATION”, VILLA RUFOLLO, RAVELLO, ITALY, 18-19 MAY 2017**

EUROPEAN AND MEDITERRANEAN MAJOR HAZARDS AGREEMENT (EUR-OPA), THE FRENCH MINISTRY OF CULTURE AND COMMUNICATION (MCC), EUROPEAN UNIVERSITY CENTRE FOR CULTURAL HERITAGE (CUEBC) with the support of ICOMOS-Italy and ICOMOS-France, International Workshop “CULTURAL HERITAGE FACING CLIMATE CHANGE: EXPERIENCES AND IDEAS FOR RESILIENCE AND ADAPTATION”, Villa Rufolo, Ravello, Italy, 18-19 May 2017

## **Concept Note**

Climate change is a growing threat to cultural heritage in Europe and elsewhere. Floods, strong storms, heat waves, extreme rain, drought and landslides are likely to increase in the future depending on latitude. This will affect monuments, archaeological sites, historical cities, museums, collections and libraries alike. The foreseen rise in sea level causing coastal erosion and invasion of continental zones by salty marine waters are certain to affect the rich coastal heritage. Higher mean temperatures will increase bio-deterioration and cause defrosting of permafrost, affecting fragile arctic cultural heritage, often made of wood. Other assets are at risk.

During the last decade the European scientific community has focused its work in defining and analysing the threats and impacts of climate change on different items of cultural heritage. The European Commission funded, among others, two important projects on the topic entitled *Noah's Ark* (2003-2007) and *Climate for Culture* (2009-2014). In 2008 the Council of Europe commissioned a report on the *Vulnerability of Cultural Heritage to Climate Change* and organised in 2009 in Ravello the first International Workshop on “*Climate Change and Cultural Heritage*” that resulted in a Recommendation of the Committee of Permanent Correspondents of the EUR-OPA Major Hazards Agreement in which states were asked to identify those cultural assets at higher risk from climate change, promote emergency planning for most vulnerable sites, promote training among heritage professionals and integrate cultural heritage into climate change adaptation policies. The Council of Europe funded from 2009 to 2015 a series of doctoral courses and training on the topic carried out in cooperation with the University Paris-Est Créteil at the European University Centre for Cultural Heritage in Ravello.

Climate Policies are different in 2017, after the publication of the 5<sup>th</sup> *Assessment Report of IPCC* (2013-2014), which for the first time mentioned the need to take care of cultural heritage in climate adaptation policies and after the guidance and commitments of the Climate *COP 21* of Paris (2015).

Have states done their homework and identified cultural heritage items at risk from climate change? Have European states developed a “climate strategy” for their cultural heritage? Do national climate change adaptation policies deal with risks to cultural heritage? What experiences have there been since 2009, what are the shortcomings? Has the scientific community responded with technical solutions to present and future problems? Have cultural heritage professionals been made aware of the problem in the years to come? Has there been training for professionals? Have budgets been mobilised to deal with the problem?

To answer these and other questions the Council of Europe, in cooperation with the Ravello Centre and the French Ministry of Culture and Communication, and with the support of ICOMOS-Italy and ICOMOS-France, is organising a workshop in 2017 in which we should like to give the word to a wide array of people: scientists involved with cultural heritage, government experts, teachers and researchers, curators, people involved in management and conservation of cultural heritage, local authorities, non-governmental organisations interested in cultural heritage, decision makers, managers of cultural routes, people working on landscapes issues and other stakeholders. It will be worth knowing if the recommendations made in 2009 have been a useful guide for governmental action, take stock of the current situation, and to discuss what should be the prospects and priorities for cultural heritage risk reduction for the next decades. We would also like to identify new initiatives which could possibly be undertaken by the Council of Europe in collaboration with partner organisations and member states, in order to ensure synergy with on-going European and national actions.

### **Introduction**

Cultural heritage is a major element of the history and identity of societies, contributing to their economy and well-being. Natural, anthropic and technological hazards have been, together with war, main sources of destruction or degradation of cultural assets. Earthquakes, floods, coastal storms, extreme weather conditions, subsidence, and landslides have taken a heavy toll on historical buildings, archaeological sites, libraries, art collections, etc; to those traditional hazards we have to add a new major risk: climate change. Focus on its impact on cultural heritage is still patchy, lacking strong policies.

### **Objectives**

The workshop presents an opportunity to debate the effects of changing climatic parameters on material and structural characteristics of cultural heritage among scientists, experienced users and policy makers. The workshop also aims to produce guidelines for governments, other institutional actors, NGOs and experts on how to better integrate climate change considerations and prevision in the protection and maintenance of cultural heritage.

The workshop will be an opportunity to present results of current work in this field and make proposals for research to identify heritage at risk and preventive measures or action and co-operation.

### **Participants**

The workshop will bring together leading scientists, government officials and experienced users in the challenging field of predicting, modeling and proposing mitigation and adaptation strategies to measure and/or limit the impact of climate change on cultural heritage.

Participation is open to interested experts. No fee will be requested from participants and attendees are expected to cover their own travelling and subsistence expenses, unless otherwise informed.

### Languages

The workshop will be conducted in English and French, with slides in English. No simultaneous translation will be provided.

### Organisers

The Council of Europe, Strasbourg, France, the French Ministry of Culture and Communication, Paris, and the European University Centre for Cultural Heritage (CUEBC), Ravello, Italy. All correspondence should be directed to both the Council of Europe, Mechthilde Fuhrer ([Mechthilde.fuhrer@coe.int](mailto:Mechthilde.fuhrer@coe.int)) Catherine Emezie([Catherine.emezie@coe.int](mailto:Catherine.emezie@coe.int)) and CUEBC ([univeur@univeur.org](mailto:univeur@univeur.org)).

### Advisory Committee

Professor Roger-Alexandre Lefèvre (university of Paris XII), Dr. Cristina Sabbioni (ISAC-CNR, Bologna).

### Programme

The programme is only indicative. There is room for new oral presentations on the topics mentioned. The workshop will permit to examine how governments in the last years have been sensitive to the threat of climate change on cultural heritage and how this would have been integrated into climate change strategies. The workshop aims to also gather experiences from different practitioners and provide an opportunity to present new ideas and proposals for research and action.

### Publication

The full texts of contributions will be published in a special issue of the series “Sciences and Materials of Cultural Heritage” at the CUEBC.

## Draft Programme

<b>DAY 1</b>	<b>Thursday 18 May 2017</b>
09:00 – 09:30	<i>Registration</i>
<b>SESSION 1</b>	<b>INTRODUCTORY SESSION</b>
09:30 – 10:00	Opening by the organisers Cultural heritage in the context of a changing climate:  <i>Co-chairs: Alfonso Andria, CUEBC and Eladio Fernández-Galiano, Council of Europe</i>
10:00 – 10:30	<b>Keynote speech: cultural heritage in a context of a changing climate: aims of the workshop</b>  <i>Cristina Sabbioni, ISAC-CNR, Bologna</i>
10:30 – 10:50	<i>Coffee break</i>
10:50- 12:30	Cultural heritage in national strategies for adaptation to climate change; two examples  <i>Cristina Sabbioni: The Italian case study</i> <i>Roger-Alexandre Lefèvre: The French case study</i>
12:30– 14:00	<i>Lunch</i>

**SESSION 2**

**EXPERIENCES OF THE PAST 10 YEARS: TAKING STOCK**

[What is being done? What are the shortcomings? The state of knowledge about threatened heritage?]

**Round table 1: Some recent work on identifying works for cultural heritage**

*Chair: Kimmo Aulake*

14:00 – 15:40

*Rapporteur: Mechthilde Fuhrer, Council of Europe*

*Speakers:*

- *Peter Brimblecombe, UEA, Norwich*
- *Antonio Gomez-Bolea, University of Barcelona*

15:40 – 16:00

*Coffee break*

16:00 - 17:45

**Round table 2: Vulnerability and threat at European and global level**

*Chair: Erminia Sciacchitano, EC DEAC, Bruxelles*

*Rapporteur: Johanna Leissner, Fraunhofer, Germany*

*Speakers:*

- *Lukas Bratasz, Poland*
- *Representative of the Insurance sector*

**DAY2**

**Friday 19 May 2017**

**SESSION 3**

**IMPLICATION OF THE PARIS AGREEMENT: WHICH NEW HERITAGE POLICIES FOR ADAPTATION?**

09:15 – 10.45

**Round table 3: International, European and National policy needs**

*Chair: Roger-Alexandre Lefèvre, Université Paris-Est Créteil*

*Rapporteur:*

*Speakers:*

- *UNESCO, Paris*
- *Erminia Sciacchitano, EC DEAC, Bruxelles*

10:45 – 11.05

*Coffee break*

11.05 – 12.35

**Round table 4: Advanced research and services in support to policy**

*Chair: Dario Camuffo*

*Rapporteur:*

*Speakers:*

- *Emanuela De Menna, EC DG R&I, Bruxelles*
- *May Cassar, UCL, UK City (management)*

12.35 – 14.15

*Lunch*

**SESSION 4                    PRIORITIES FOR THE FUTURE**

14.15 – 15:45            **Round table 5: What role for governments, what role for scientists and conservators .....**

*Chair:* .....

*Rapporteur: Hilde de Clerq, KIKIRPA, Belgium and ICCROM*

*Speakers:*

- *Patrizia Bianconi, JPI Cultural Heritage*
- *Kimmo Aulake European Cultural Heritage Strategy for the 21<sup>st</sup> century*

15:45 – 16:05            *Coffee break*

16:05 – 17:30            **CONCLUSION**

*Chair: May Cassar*

*Speakers:*

- *Cristina Sabbioni Eladio Fernandez-Galiano*
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**THE HISTORICAL METALLURGY**  
**SOCIETY'S 2017 AGM, THE METALLURGY**  
**OF OUR PORTABLE HERITAGE, SATURDAY**  
**17<sup>TH</sup> JUNE, 2017, INSTITUTE OF**  
**ARCHAEOLOGY, UNIVERSITY COLLEGE**  
**LONDON**

The metallurgy of our portable heritage is being held on Saturday the 17th June, 2017 at the Institute of Archaeology, University College London

The Historical Metallurgy Society in conjunction with the Portable Antiquities Scheme would like to invite submissions for papers for a study day on the metallurgy of our portable heritage. This meeting is aimed at a wide variety of contributors, from archaeological metallurgists, excavators, post-excavation specialists and PAS officers. The meeting is for open to anyone interested in finding out more about metal objects; be they gold, silver, copper alloy or iron.

The programme is now out, with a wide range of topics. The programme and booking form is available on our website <http://hist-met.org/meetings/agm-meeting.html>. Online bookings will be open soon.

General enquiries can be directed to Eleanor Blakelock at [events@hist-met.org](mailto:events@hist-met.org).

**10<sup>TH</sup> INTERNATIONAL SYMPOSIUM ON THE  
CONSERVATION OF MONUMENTS IN THE  
MEDITERRANEAN BASIN (MONUBASIN)  
"NATURAL AND ANTHROPOGENIC  
HAZARDS AND SUSTAINABLE  
PRESERVATION", 20-22 OF SEPTEMBER  
2017, NATIONAL TECHNICAL UNIVERSITY  
OF ATHENS**

This **International Symposium on the Conservation of Monuments in the Mediterranean Basin (MONUBASIN)** has provided a forum for scientists, technicians and experts, in the area of conservation and restoration of monuments, to present their work and exchange ideas and experiences for over **28 years**.

In this context, we have the great pleasure to announce that the **National Technical University of Athens (NTUA, School of Chemical Engineering, Material Science and Engineering Section)** will be organizing the **10th MONUBASIN**.

The Symposium will take place from **20 to 22 of September 2017** following previous symposia at Bari (1989), Geneva (1991), Venice (1994), Rhodes (1997), Seville (2000), Lisbon (2004), Orléans (2007), Patras (2010) and Ankara (2014).

The theme of this Symposium is "**Natural and Anthropogenic Hazards and Sustainable Preservation**" and refers to the natural and anthropogenic hazards on monuments, as well as to the technologies used for damage rehabilitation in the direction of sustainable, long-lasting preservation.

The Symposium addresses research work from restoration engineers, architects, geologists, restorers and conservators of stone artifacts and other specialists in the decay and restoration of monuments, as well as archaeologists, art historians and scientists in the fields of physics, chemistry and biology.

During the 10<sup>th</sup> Symposium, the **Monubasin Digital Repository (MDR)** will be presented to the participants. The MDR will offer access to all previous Symposiums' proceedings (more than 900 papers) providing various methods of search (e.g. full-text search, by author name, by paper title, by Symposium, etc.). All Symposium participants will have free access to the MDR contents.

Please visit the site: <http://conference2017.monubasin.com/>

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**1<sup>ST</sup> WORKSHOP FOR YOUNG  
RESEARCHERS IN ARCHAEOLOGY AND  
CONSERVATION STUDIES, 10<sup>TH</sup>-12<sup>TH</sup>  
SEPTEMBER 2017, INSTITUTE FOR  
GEOSCIENCES, GOETHE UNIVERSITY  
FRANKFURT**

Young researchers from different institutions and educational backgrounds study and work in the fields of archaeology and conservation studies. Due to the varying methodological and analytical approaches, mutual exchange and networking particularly among students and young researchers in general is rendered difficult. The 1<sup>st</sup> workshop for young researchers in archaeology and conservation studies aims to close this gap and invites all young researchers to present their work in a convenient/relaxed atmosphere and to discuss among peers. Contributions should focus on analytical studies of archaeological materials or on institutions carrying out research in archaeology and/or conservation studies.

The workshop is jointly given with the [GNAA](#).

Date: 10<sup>th</sup> to 12<sup>th</sup> September 2017

Location: Institut for Geosciences, Goethe University Frankfurt

Participation fee: 30 €

Travel bursaries: 50 € for members of the GNAA and/or DMG, if they are not provided by the projects or institutes.

Please visit the site: <http://www.dmg-home.org/dmg-home/sektionen-arbeitskreise-kommissionen-und-projektgruppen/ak-archaeometrie-und-denkmalpflege/tagungen-des-ak/workshop/>

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## **PROHITECH2017 LISBON - EARLY REGISTRATION NOW OPEN**

Dear Colleague,

The Instituto Superior Técnico (IST-UL) and the University of Naples (UNINA) are pleased to invite you to participate in PROHITECH'17, the 3rd International Conference on Protection of Historical Constructions, due to take place in Lisbon (Lisboa), Portugal, from July 12 to 15, 2017, [www.prohitech2017.com](http://www.prohitech2017.com).

If you already are a registered author and/or wish to attend the Conference, please note that the **registration is open** and that the **early registration** is valid until **May 15, 2017**.

You can know the **registration fees** at:

<http://prohitech2017.com/index.php/registration/registration-fees> and you access the **registration form** at: <http://prohitech2017.com/index.php/registration/registration-form>

**One very important note: July is high season** in Lisbon and that finding accommodation will be increasingly difficult (and more costly) as the event approaches, so please book the accommodation as soon as possible.

The optional and unique **technical visits**, due to take place on **July 15**, are already defined. You can get more info at: <http://prohitech2017.com/index.php/programme/technical-visits>

Please feel free to contact us, either for scientific purposes [prohitech2017-scientific@fundec.pt](mailto:prohitech2017-scientific@fundec.pt) or administrative [prohitech2017@abreu.pt](mailto:prohitech2017@abreu.pt).

Looking forward to welcoming you in Lisboa!

Prof. Luis Calado (IST-UL) Prof. Federico M. Mazzolani (UNINA)

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## **ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS**

### **ORIENTAL INSTITUTE COLLECTIONS**

### **RESEARCH GRANT IN 2017–2018**

We are pleased to announce that the Oriental Institute will once again be awarding grants to work with the museum collections as part of the Oriental Institute Collections Research Grant in 2017–2018, thanks to the generous support of Jim Sopranos. The deadline for applications is Friday, April 14th, 2017. Notifications will be sent to applicants in early June, with research visits taking place between July 2017 and June 2018. Please visit the website for additional information and share this update with friends and colleagues who might be interested: <https://oi.uchicago.edu/collections-research-grant>

We welcome applications from a wide spectrum of researchers, from those at the graduate student level (i.e. Masters Degree or PhD candidates) to well-established professional researchers in their field of study. Applications are welcome from researchers from all nationalities. Applicants may also include researchers affiliated with the University of Chicago, including the Oriental Institute.

We allow for the broadest possible selection of potential projects that will heighten the level of intellectual discourse and collaboration within the Oriental Institute. Invitations may be made to share research with faculty, staff, and students through informal presentations during the research visit.

A committee comprised of Oriental Institute faculty members and museum staff will review proposals and may award either a single grant of up to \$10,000, or may opt to provide smaller awards to more than one individual per year. Decisions concerning the outcome of awards will be made and notifications sent to successful applicants in early June, with the award made active from July 1st each year. The grant must be fully utilized and completed prior to June 30th of the year following the researcher's notification of a successful application. The expected duration of the research visit is flexible within this period, but must be stipulated in the application. Other research funds may be used in combination with this grant to increase the duration of a research visit, but must be stipulated (if known) at the time of application. The selection process will take into consideration the quality of research questions and appropriate methodologies, the scope and types of material being studied, the sites, periods, or sub-collections of material, as well as detailing potential requirements for special equipment or scientific analysis of material.

Funding is primarily aimed to help support the costs of travel, accommodation, subsistence, to supplement student salaries, and to cover relevant research costs for the researcher during the appointed period. The grantee will not be appointed an office, desk space, or computer, although access will be provided to our Research Archives (Oriental Institute library) and Collections study areas.

Requirements: Candidates must hold at least a Bachelor's Degree in a field of study. Applications are open to students enrolled in a relevant Master's Degree or Ph.D

Program (i.e. graduate student level), as well as to established professional researchers with a University affiliation, researchers within museums, and independent researchers.

Grantees must submit an interim report at the end of their research visit and a final report at the conclusion of their research. Publications resulting from this research grant must acknowledge the grant from the Oriental Institute appropriately, and grantees must provide a digital and/or hard-copy of any publications resulting from their research to the Oriental Institute. Appropriate permissions must be sought for studying unpublished material and images of documents or objects taken during the course of research through consultation with the Museum. Copies of images of Museum documents or objects taken by the grantee during the course of their research will be provided to the Museum for potential inclusion on its Integrated Database.

To apply:

Please send your applications and enquiries by email only to: <mailto:oi-museum@uchicago.edu> including the subject line: “Collections Research Grant”

The application must include in one single document (Word or pdf.):

A cover letter indicating your research interests and suitability for the grant.

A two page proposal outlining the proposed research topic, collections of interest in the Oriental Institute, duration of project and suggested dates, and relevant publication plans.

A curriculum vitae (2 pages maximum).

A budget (1 page maximum), including other grants that may be contributing to this research.

Contact details for two referees.

Application Deadline: 5pm (US Central Daylight Time), Thursday, April 14th, 2017

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## ARCHAEOMETALLURGY MSC BURSARIES

The [Institute for Archaeo-Metallurgical Studies](#) (IAMS) and the [UCL Institute of Archaeology](#) invite applications for two student bursaries for postgraduate studies in archaeometallurgy leading to an MSc degree.

- IAMS Bursary in Archaeometallurgy (£5,000)
- Ronald F. Tylecote Bursary in Archaeometallurgy (£5,000)

Any candidates accepted for the [MSc in Archaeological Science: Technology and Materials](#) are eligible for either bursary, provided that they express a commitment to write a dissertation on an archaeometallurgical topic. Students are welcome to suggest their own dissertation topics at the time of applying, but this is not a requisite.

In the personal statement accompanying their application to the MSc, they should include a brief comment expressing their interest in being considered for the above bursaries. Applications will be assessed based on the academic merit of the applicants and their statements.

**Deadline: 1 June 2017**

Any enquiries about the bursaries may be directed to [Marcos Martinon-Torres](#) ([m.martinon-torres@ucl.ac.uk](mailto:m.martinon-torres@ucl.ac.uk))

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# **CODING, DATA MANAGEMENT, AND SHINY APPLICATIONS USING RSTUDIO FOR EVOLUTIONARY BIOLOGISTS AND ECOLOGISTS (CDSR01)**

This course is being delivered by Aline Quadros, an ecologist and researcher at the Leibniz Centre for Tropical Marine Research in Germany.

This course will run from the 15th - 19th May 2017 at SCENE field station, Loch Lomond, Scotland.

## Course overview:

The course will introduce programming logic using the R syntax. The participants will be able to solve problems involving heterogeneous biological datasets and the combined use of different statistical packages, so the advantages of learning programming skills can be demonstrated. The RMarkdown syntax will be used to illustrate the advantages of literate programming and the possibilities of code sharing and archiving. In the sequence, participants will learn how to design relational databases (RDB) which can be used to manage and analyse large biological datasets. They will learn the basics of the SQL language and how to use it with R with the package {RMySQL}. To finalise, they will use the Shiny tool (R Studio) to build interactive applications to analyse and display data depending on user inputs. Throughout the course we will emphasise data, code and analyses best practices that could foster reproducibility and transparency in science, and the long-term availability of scientific data. At the end of the course the participants are expected to be able to develop small, tailored applications, to read and analyse datasets using a variety of statistics tools.

## Intended Audience:

Researchers and postgraduate students working with in evolutionary biology and ecological data who want to have more autonomy and flexibility in their quantitative analyses, and need to access and analyse large datasets with R.

## Day 1

### Module 1: Programming Logic

R syntax (Variable types – operators – conditionals – loops – writing functions)  
Programming and commenting code with RMarkdown

## Day 2

### Module 2: Data structures

R syntax (arrays, lists, data frames, matrices) Data wrangling with {dplyr} and {tidyr}; the {ff} package and data tables for large datasets (e.g. transcriptomics; whole-genome data) Best practices of data acquisition, organization and storage

## Day 3

### Module 3: Relational databases

Introduction to the SQL language and MySQL (open-source RDB freeware) Accessing and analysing large datasets using the package {RMySQL} As an example, we will

combine DNA sequence datasets with IUCN Red List data illustrate the use of RDB to biological datasets.

Day 4

Module 4: Introduction to Shiny (R Studio) Shiny – Server and user interface commands  
As an example we will use Shiny to develop a small application where users can select different species and genes and run/visualize phylogenetic trees using {ape} running in the background.

Day 5

Module 5: Wrapping-up

Development and presentation of individual projects combining data wrangling skills and user inputs using Shiny (R Studio)

Teaching Format:

The course will be highly practical, with a series of hands-on, step-by-step, problem-solving exercises, combining the different tools to solve ecological and evolutionary biology problems. The participants are invited to think of a problem that requires programming skills to be solved, and can bring their own data for a case-study. At the end of each day the participants will have time to work on their on projects and apply the skills learned on that day.

We offer two packages

COURSE ONLY – Includes lunch and refreshments.

ALL INCLUSIVE – Includes breakfast, lunch, dinner, refreshments, minibus to and from meeting point and accommodation. Accommodation is multiple occupancy (max 3 people) single sex en-suite rooms. Arrival Sunday 14th May and departure Friday 19th May PM.

Please send enquiries to [oliverhooker@prstatistics.com](mailto:oliverhooker@prstatistics.com) or visit [www.prstatistics.com](http://www.prstatistics.com) for more details.

Other relevant upcoming courses are as follows

1. ADVANCES IN MULTIVARIATE ANALYSIS OF SPATIAL ECOLOGICAL DATA USING R #MVSP

3rd – 7th April 2017, Scotland, Prof. Pierre Legendre, Dr. Olivier Gauthier  
<http://www.prstatistics.com/course/advances-in-spatial-analysis-of-multivariate-ecological-data-theory-and-practice-mvsp02/>

2. ADVANCING IN STATISTICAL MODELLING FOR EVOLUTIONARY BIOLOGISTS AND ECOLOGISTS USING R #ADVR

17th – 21st April 2017, Scotland, Dr. Luc Bussiere, Dr. Ane Timenes Laugen  
<http://www.prstatistics.com/course/advancing-statistical-modelling-using-r-advr06/>

3. CODING, DATA MANAGEMENT AND SHINY APPLICATIONS USING RSTUDIO FOR EVOLUTIONARY BIOLOGISTS AND ECOLOGISTS #CDSR

15th - 19th May, Scotland Dr. Aline Quadros <http://www.prstatistics.com/course/coding-data-management-and-shiny-applications-using-rstudio-for-evolutionary-biologists-and-ecologists-cdsr01/>

4. GEOMETRIC MORPHOMETRICS USING R #GMMR  
5th – 9th June 2017, Scotland, Prof. Dean Adams, Prof. Michael Collyer, Dr. Antigoni Kaliontzopoulou <http://www.prstatistics.com/course/geometric-morphometrics-using-r-gmmr01/>
5. MULTIVARIATE ANALYSIS OF SPATIAL ECOLOGICAL DATA #MASE  
19th – 23rd June, Canada, Prof. Subhash Lele, Dr. Peter Solymos  
<http://www.prstatistics.com/course/multivariate-analysis-of-spatial-ecological-data-using-r-mase01/>
6. TIME SERIES MODELS FOR ECOLOGISTS USING R (JUNE 2017 #TSME  
26th – 30th June, Canada, Dr. Andrew Parnell <http://www.prstatistics.com/course/time-series-models-foe-ecologists-tsme01/>
7. BIOINFORMATICS FOR GENETICISTS AND BIOLOGISTS #BIGB  
3rd – 7th July 2017, Scotland, Dr. Nic Blouin, Dr. Ian Misner  
<http://www.prstatistics.com/course/bioinformatics-for-geneticists-and-biologists-bigb02/>
8. META-ANALYSIS IN ECOLOGY, EVOLUTION AND ENVIRONMENTAL SCIENCES #METR01  
24th – 28th July, Scotland, Prof. Julia Koricheva, Prof. Elena Kulinskaya  
<http://www.prstatistics.com/course/meta-analysis-in-ecology-evolution-and-environmental-sciences-metr01/>
9. SPATIAL ANALYSIS OF ECOLOGICAL DATA USING R #SPAE  
7th – 12th August 2017, Scotland, Prof. Jason Matthiopoulos, Dr. James Grecian  
<http://www.prstatistics.com/course/spatial-analysis-ecological-data-using-r-spae05/>
10. ECOLOGICAL NICHE MODELLING USING R #ENMR  
16th – 20th October 2017, Scotland, Dr. Neftali Sillero  
<http://www.prstatistics.com/course/ecological-niche-modelling-using-r-enmr01/>
11. INTRODUCTION TO BIOINFORMATICS USING LINUX #IBUL  
16th – 20th October, Scotland, Dr. Martin Jones  
<http://www.prstatistics.com/course/introduction-to-bioinformatics-using-linux-ibul02/>
12. GENETIC DATA ANALYSIS AND EXPLORATION USING R #GDAR  
23rd – 27th October, Wales, Dr. Thibaut Jombart, Zhian Kavar  
<http://www.prstatistics.com/course/genetic-data-analysis-exploration-using-r-gdar03/>
13. STRUCTURAL EQUATION MODELLING FOR ECOLOGISTS AND EVOLUTIONARY BIOLOGISTS USING R #SEMR  
23rd – 27th October, Wales, Prof Jarrett Byrnes, Dr. Jon Lefcheck  
<http://www.prstatistics.com/course/structural-equation-modelling-for-ecologists-and-evolutionary-biologists-semr01/>
14. LANDSCAPE (POPULATION) GENETIC DATA ANALYSIS USING R #LNDG



6th – 10th November, Wales, Prof. Rodney Dyer  
<http://www.prstatistics.com/course/landscape-genetic-data-analysis-using-r-lndg02/>

15. APPLIED BAYESIAN MODELLING FOR ECOLOGISTS AND EPIDEMIOLOGISTS #ABME

20th - 25th November 2017, Scotland, Prof. Jason Matthiopoulos, Dr. Matt Denwood  
<http://www.prstatistics.com/course/applied-bayesian-modelling-ecologists-epidemiologists-abme03/>

16. INTRODUCTION REMOTE SENSING AND GIS APPLICATIONS FOR ECOLOGISTS #IRMS

27th Nov – 1st Dec, Wales, Dr Duccio Rocchini, Dr. Luca Delucchi  
<http://www.prstatistics.com/course/introduction-to-remote-sensing-and-gis-for-ecological-applications-irms01/>

17. INTRODUCTION TO PYTHON FOR BIOLOGISTS #IPYB

27th Nov – 1st Dec, Wales, Dr. Martin Jones  
<http://www.prstatistics.com/course/introduction-to-python-for-biologists-ipyb04/>

18. DATA VISUALISATION AND MANIPULATION USING PYTHON #DVMP

11th – 15th December 2017, Wales, Dr. Martin Jones  
<http://www.prstatistics.com/course/data-visualisation-and-manipulation-using-python-dvmp01/>

19. ADVANCING IN STATISTICAL MODELLING USING R #ADVR

11th – 15th December 2017, Wales, Dr. Luc Bussiere, Dr. Tom Houslay, Dr. Ane Timenes Laugen, <http://www.prstatistics.com/course/advancing-statistical-modelling-using-r-advr07/>

20. INTRODUCTION TO BAYESIAN HIERARCHICAL MODELLING #IBHM

29th Jan – 2nd Feb 2018, Scotland, Dr. Andrew Parnell  
<http://www.prstatistics.com/course/introduction-to-bayesian-hierarchical-modelling-using-r-ibhm02/>

21. ANIMAL MOVEMENT ECOLOGY (February 2018) #ANME

??th - ??th February 2018, Wales, Dr Luca Borger, Dr. John Fieberg

22. AQUATIC TELEMETRY DATA ANALYSIS USING R (TBC) #ATDAR

??th - ??th February 2018, Wales,

23. FUNCTIONAL ECOLOGY FROM ORGANISM TO ECOSYSTEM: THEORY AND COMPUTATION #FEER

5th – 9th March 2018, Scotland, Dr. Francesco de Bello, Dr. Lars Götzenberger, Dr. Carlos Carmona <http://www.prstatistics.com/course/functional-ecology-from-organism-to-ecosystem-theory-and-computation-feer01/>

24. STABLE ISOTOPE MIXING MODELS USING SIAR, SIBER AND MIXSIAR #SIMM

Dr. Andrew Parnell, Dr. Andrew Jackson – Date and location to be confirmed



25. NETWORK ANALYSIS FOR ECOLOGISTS USING R #NTWA  
Dr. Marco Scotti - Date and location to be confirmed

26. MODEL BASE MULTIVARIATE ANALYSIS OF ABUNDANCE DATA  
USING R #MBMV0  
Prof David Warton - Date and location to be confirmed

27. ADVANCED PYTHON FOR BIOLOGISTS #APYB  
Dr. Martin Jones - Date and location to be confirmed

28. PHYLOGENETIC DATA ANALYSIS USING R (TBC) #PHYL  
Dr. Emmanuel Paradis – Date and location to be confirmed

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Oliver Hooker PhD.  
PR statistics

most recent publication - The physiological costs of prey switching reinforce foraging  
specialization - Journal of animal ecology  
<http://onlinelibrary.wiley.com/doi/10.1111/1365-2656.12632/full>  
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Please visit the site : <http://www.prstatistics.com/course/coding-data-management-and-shiny-applications-using-rstudio-for-evolutionary-biologists-and-ecologists-cdsr01/>

## **INSTITUTIONAL DEVELOPMENT GRANT FROM THE WENNER-GREN FOUNDATION**

The Wenner-Gren Foundation for Anthropological Research established the Institutional Development Grant (IDG) program in 2008. The IDG is intended to strengthen (or to support the development of) anthropological doctoral programs in countries where the discipline is underrepresented. The grant provides \$25,000 per year, is renewable for a maximum of five years (total support of \$125,000), and may be used for any purpose to achieve the academic development goals of the applicant department. A minimum of one new award will be made each year, and applicant departments are expected to have developed strong partnership arrangements with other anthropological institutions that can help them achieve their development goals.

Since the program's inauguration, ten institutions have received IDG grants: The Central Department of Sociology and Anthropology at Tribhuvan University, Nepal; The Department of Social and Cultural Anthropology at Mongolian National University; The Museo Antropologia, National University of Cordoba, Argentina; The Anthropological Studies Program, University of the Philippines, Diliman, Philippines; The Department of Anthropology, Vietnam, National University, Hanoi, Vietnam; The Department of Social Anthropology, Addis Ababa University, Ethiopia; The Faculté d'Ethnologie at Université d'Etat d'Haiti, Port-Au-Prince, Haiti; The Baltic States - University of Latvia, Riga Stradins University (Latvia), University of Tallinn (Estonia) and Vytautas Magnus University (Lithuania); the Institut Fondamental d'Afrique Noire /University Cheikh Anta Diop of Dakar, Senegal, and The College Of Language And Culture Studies, Royal University Of Bhutan, Taktse, Trongsa, Bhutan.

The Institutional Development Grant has a two-stage application process: the submission of a preliminary inquiry, followed by the submission of a full application. The deadline for the mandatory preliminary inquiry is May 15, 2017. The preliminary inquiry must be submitted using the preliminary inquiry form, which can be downloaded from the <https://t.e2ma.net/click/defho/14rfcb/5rk0ee>. The deadline for those applicants invited to submit a full application is September 15, 2017. Awards will be announced in November 2017 for programs beginning in January 2018.

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Wenner-Gren Foundation  
470 Park Avenue South, 8th Floor  
New York, NY 10016 USA  
Tel (212) 683-5000  
Fax (212) 532-1492

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Please visit the site: <https://t.e2ma.net/message/defho/14rfcb>

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## **INTERNATIONAL FIELD SCHOOL ON SITE FORMATION, STRATIGRAPHY, AND GEOARCHAEOLOGY IN ANCIENT CORINTH, JUNE 5 TO 9, 2017**

The Malcolm H. Wiener Laboratory for Archaeological Science (ASCSA) in collaboration with the ASCSA Excavations at Ancient Corinth offers a week-long Field School on Site Formation, Stratigraphy, and Geoarchaeology at Ancient Corinth. Dr. Panagiotis (Takis) Karkanis, director of the Wiener Laboratory and Paul Goldberg, Professor emeritus of Boston University, will supervise the intensive field school. Registered students will participate in the Corinth excavation and will be involved in interdisciplinary research primarily in the field, focused on archaeological context, geoarchaeology, and material sciences. Through field observations, on-site laboratory analysis, and lectures the students will receive instruction in the study and analysis of archaeological sediments and deposits, as well as gain experience in the recording of stratigraphy, and the understanding site formation processes. A maximum of 10 students will be accepted for the course. Preference is given to advanced students and post-docs with a background in archaeology, and preferably some exposure to the natural sciences as well.

The cost for Room and Board is 250 euros for the entire week. Travel costs to Greece and to the site are not included.

The course will take place from June 5 to 9, 2017. Applications should be sent no later than **30th April** to [tkarkanis@ascsa.edu.gr](mailto:tkarkanis@ascsa.edu.gr). They should include one paragraph explaining why the candidate is interested in participating in the course, a CV, a list of grades, and names and email addresses of two referees. Participants who successfully complete the course of instruction will receive a certificate detailing the content of the field school.

Textbooks: Practical and Theoretical Geoarchaeology 2006 by Paul Goldberg and Richard I. Macphail (Blackwell) and Microarchaeology 2010 by Stephen Weiner (Cambridge University Press).

A syllabus will be emailed 3 weeks before the start of the field school.

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**ARCHAEOLOGICAL EXCAVATIONS IN  
DELPHI LATE MYCENAEAN SETTLEMENT -  
SCHOOL OF HUMANITIES - DEPARTMENT  
OF MEDITERRANEAN STUDIES, 19 JUL 2017  
TO 1 AUG 2017, DELPHI**

Dear Students / Participants,

Each year students from Greek and American Universities participate in the successful Summer Schools run by University of the Aegean at Delphi Greece.

In the summer 2017 in July we will have the second year of excavations at Kastrouli (Desfina near Delphi, Fokida) and we invite students from all over the World to apply.

The site date from the Mycenaean period (LH III B & C, from approx. 1300 BC onwards) and later.

In the year 2016 we excavated many important findings that are unique in Greece in the Late Helladic period. Our activity includes the methodology of archaeological excavations & archaeological sciences. The program expands and to a survey that will contain and area towards the Corinthian Gulf. (see gallery photos of our activities)

The planned 2017 season will run for 2 weeks after 19<sup>th</sup> July 2017. It will be offered as a Summer School with certification **5 ECTS** (European Credit Transfer Units) recognized by European and World accredited Universities. NB: 1 ECTS is equivalent to 26 hours of labor i.e. lectures, reading & learning, educational trips, lab work, fieldwork).

The number is limited to about 20 (Greek and foreign). Expected Fees (tuition, accommodation, meals, local travel) is expected to be 900 Euros, for 12 days all inclusive (except your travel to the site).

The requirements for admission are: 1) completion of *essay* prior to coming in the site ([press here for essay](#)), 2) knowledge of English language, 3) writing up a Reflective Journal in the field.

The performance for your transcript will be 60% performance in the field + 20% essay + 20% reflective journal. The certificate and Annex rating are provided properly signed and stamped by the administration of the University. Last year we had 18 students from US in the 1st summer school project with success.

*\*For students from USA and China: We have a collaboration between University of the Aegean and University of Science & Technology of China (USTC) Hefei; University of Henan, China; Charles University, Prague (Czech); and University of California San Diego (UCSD) for 2016, that includes such activities.*

Prof Ioannis LIRITZIS

University of the Aegean ([liritzis@rhodes.aegean.gr](mailto:liritzis@rhodes.aegean.gr); [www.liritzis.gr](http://www.liritzis.gr))  
Project Leader-PI: Prof. Ioannis Liritzis ([liritzis@rhodes.aegean.gr](mailto:liritzis@rhodes.aegean.gr))  
Scientific Responsible of archaeological excavations Co-PI: Dr. Athanasios Sideris,  
University of the Aegean.

### TARGET GROUP- COURSE DESCRIPTION

Target Group: PhD candidates, graduates, undergraduates, public & private sector, Archaeology graduates or undergraduates, cultural Heritage researchers, archaeometrists, archaeological scientists, civil servants from the public or private sector involved with heritage, scientists in cultural issues, cultural management, dissemination & documentation, museologists, graduates in cultural studies, museology, survey archaeologists, engineers in documenting cultural tourism, sustainable development from cultural heritage and museums, virtual museum learners, freelancers.

### Course Description - Learning Outcomes

Familiarization of participants with the archaeological surveys, archaeological dig, documentation, processing of excavated finds, preventive conservation issues, hands on archaeometric non-destructive analysis in situ, writing excavation reports and keeping diaries. All tutoring shall be given having in mind the level for beginners in the field.

- *Introduction to the current state-of-the-art of modern archaeological excavations and trends (cyberarchaeology, Archaeometry, Excavation techniques, the archaeology of the area)*
- *12 days excavation, measurements, lab processing of finds*
- *1 day museum and sanctuary of Delphi guiding and educational touring in adjacent areas around Delphi and Corinthian Gulf*

Particular emphasis will be given to practical professional experience. Students will have a great experience and form strong bonds with their peers on a field program. For this reason our Programme offers something more than a great academic course; including special opportunities and experiences in situ and in storage lab.

*And more experiences....try the local traditional delicious cook, mix with local people and swim in the blue Corinthian Gulf waters .....*

### KASTROULI AND TROYAN WAR?

The settlement of modern Kastrouli is situated in the modern border of Phokis and Boeotia provinces Central Greece, and both provinces are recorded in the [Book II](#) of [Homer's Iliad](#) (2.494-759, II.494-526) as contributing to the Greek navy task force against Troy.

In The Catalogue of Ships (νεῶν κατάλογος; neōn katalogos) is a passage in [Book II](#) of [Homer's Iliad](#) (2.494-759) which lists the contingents of the Achaean army which sailed to [Troy](#). The catalogue gives the name of the leader of each contingent, describes his home city, and gives the number of ships he led to Troy.

For **Phokis** the passage quotes:

“Schedius and Epistrophus, sons of Iphitus,  
the son of great-hearted Naubolus,  
commanded Phoceans—men from Cyparissus,  
rocky Pytho, holy Crisa, Daulis, and Panopeus;  
men from Anemorea and Hyampolis;  
from around the sacred river Cephissus,

from Lilaea, beside Cephissus' springs.  
Forty black ships these two leaders brought with them.  
Moving around, as soldiers armed themselves,  
they set Phocian ranks by the Boeotians, on their left....”

For **Boeotia** the catalogue mentions:

“Peneleus, Leitus, and Arcesilaus  
led the Boeotians, with Clonius and Prothoenor.  
Their men came from Hyria, rocky Aulis,  
Schoenus, Scolus, mountainous Eteonus,  
Thespeia, Graia, spacious Mycalassus,  
men holding Harma, Eilesiun, Erythrae;  
men holding Eleon, Hyle, Peteon,  
Ocalea, the well-built fortress Medeon,  
Copae, Eutresis, Thisbe, city full of doves;  
men from Coronea, grassy Haliartus;  
men from Plataea, Glisas, those who held  
fortified Lower Thebes and sacred Onchestus,  
with Poseidon's splendid grove; men from Arne,  
land rich in grapes, Midea, sacred Nisa,  
and distant Anthedon. Fifty ships came with these men,  
each with one hundred and twenty young Boeotians....”

Kastrovli is in close distance to some at least identified towns, such as, Medeon, Pytho, Crisa, Cyparissos, and most probably may have a relationship to the contributing task force of Achaeans against Troy. The conjecture remains to be revealed from more excavation finds.....

Please visit the site: <https://summer-schools.aegean.gr/KASTROULI2017>

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# **INTERNATIONAL HELLENIC UNIVERSITY'S** **2017 5<sup>TH</sup> SUMMER SCHOOL ON ANCIENT** **TECHNOLOGY AND THE VOYAGE OF** **LUXURIES, 26 JUNE-7 JULY, THESSALONIKI,** **GREECE**

## **Programme Summary**

Progress and innovation in technology were of exceptional importance for the development of ancient societies and have been of great interest to many disciplines. This year, the International Hellenic University Summer School is focusing on Ancient Technology and the Voyage of Luxuries offering the opportunity to study how technological achievements of ancient cultures facilitate luxurious activities; luxury as a social practice is exclusive per se. Based on the processes of the integration of those who belong to a certain elite group, but also on the exclusion of those who don't, it is actually a social identifier throughout Antiquity. Subjects such as how the diffusion of improved infrastructural, organizational and mechanical technologies facilitated the production and distribution of luxury items (e.g. faience, glassware, jewelry, ceramics, toreutics, etc) or how the invention and transfer of new technologies served the needs of the ancient societies for prosperity, hence luxury, will be discussed.

In the course of the programme, the latest historical research along with state-of-the-art scientific techniques applied to the analysis of archaeological findings will be presented by senior academics and field archaeologists who are experts in their research areas.

The **Summer School** on Ancient Technology is planned to be held annually with the aim of a) providing an international forum on technological achievements of the ancient Greek world and b) making greater use of the rich resources of Greece in terms of specialists in ancient technology research.

The aim of this 2-week intensive **School** is to make the participants more acquainted with aspects of ancient technologies by providing up-to-date knowledge presented and discussed by the experts of the relevant fields.

[Click here to see the course poster](#) | [Click here to see the course leaflet](#)

## **Programme Topics & Structure**

### **PRESTIGE ITEMS PRODUCTION**

- Early Glass: Cutting-edge technologies and luxury items
- Craft production in the Mycenaean palatial records
- Luxury and Coinage
- The circulation of ceramics as containers and/or luxury items
- **Luxury Toreutics: Vagaries of Life-Style and Diplomacy**

### **THE LUXURY IN BUILT ENVIRONMENT**

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**TOWARDS WRITER IDENTIFICATION IN**  
**THE DEAD SEA SCROLLS**

Authors: Maruf A. Dhali, Sheng He, Mladen Popović, Eibert Tigchelaar, and Lambert Schomaker

In Proceedings of the 6th International Conference on Pattern Recognition Applications and Methods - Volume 1: ICPRAM, 693-702, 2017, Porto, Portugal

ISBN: 978-989-758-222-6

Abstract: To understand the historical context of an ancient manuscript, scholars rely on the prior knowledge of writer and date of that document. In this paper, we study the Dead Sea Scrolls, a collection of ancient manuscripts with immense historical, religious, and linguistic significance, which was discovered in the mid-20th century near the Dead Sea. Most of the manuscripts of this collection have become digitally available only recently and techniques from the pattern recognition field can be applied to revise existing hypotheses on the writers and dates of these scrolls.

This paper presents our ongoing work which aims to introduce digital palaeography to the field and generate fresh empirical data by means of pattern recognition and artificial intelligence. Challenges in analyzing the Dead Sea Scrolls are highlighted by a pilot experiment identifying the writers using several dedicated features. Finally, we discuss whether to use specifically-designed shape features for writer identification or to use the Deep Learning methods on a relatively limited ancient manuscript collection which is degraded over the course of time and is not labeled, as in the case of the Dead Sea Scrolls.

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## **ANTIKYTHERA MECHANISM RESEARCH PROJECT, THE INSCRIPTIONS OF THE ANTIKYTHERA MECHANISM**

Almagest: International Journal for the History of Scientific Ideas, 7.1, March 2016.  
Turnhout: Brepols Publishers, 2016. Pp. 319. ISBN 17922593. €33.00 (pb).

Bryn Mawr Classical Review 2017.03.11

Reviewed by Anna Toscano, Campus Numérique Arménien, Lyon  
([toscano.anna@virgilio.it](mailto:toscano.anna@virgilio.it))

La vicenda è nota: nella primavera di 116 anni fa un pescatore di spugne dell'isola di Symi, Ilias Stadiatis, tuffandosi nelle acque al largo della costa est di Antikythera, dove era ancorata l'imbarcazione a causa di una tempesta, ad una profondità segnalata tra i 42 ed i 50 metri si imbatté in un relitto di un naufragio avvenuto nel secondo quarto del I secolo a.C.

A testimonianza del ritrovamento Stadiatis portò in superficie un braccio di una statua di bronzo. Nel novembre di quello stesso anno Dimitrios Kontos, capitano del battello per la pesca di spugne, allertò le autorità di Atene della scoperta. La reazione fu rapida: la nave della Marina reale ellenica Mykali fu inviata verso l'isola per supportare le operazioni di recupero, seguita subito dalla nave civile a vapore Syros e successivamente dalla torpediniera della Marina Aigialeia.

Nel corso dei dodici mesi successivi, sfidando le tempeste invernali, con immersioni di oltre 50 m furono portate alla luce centinaia di opere d'arte tra bronzi, statue di marmo del periodo ellenistico e numerosi manufatti, oggi conservati nelle gallerie del Museo Archeologico Nazionale di Atene, che identificarono in questa nave mercantile del 65 a. C. ca. il più ricco relitto antico mai scoperto.

Ma l'eccezionalità di quel rinvenimento è legata nella memoria collettiva ad una delle più sorprendenti scoperte archeologiche dell'ultimo secolo: il 17 maggio del 1902 l'archeologo Valerios Stais, esaminando i reperti rinvenuti nel relitto, notò che un blocco di pietra presentava un ingranaggio inglobato al suo interno. Ad un esame più approfondito si appurò che ciò che inizialmente era stato interpretato come materiale lapidico era in realtà un dispositivo meccanico, notevolmente corrosivo e con numerose incrostazioni, dalle dimensioni di circa 30 cm per 15 cm, del quale erano sopravvissute tre parti principali e decine di frammenti minori: si trattava di un'intera serie di ruote dentate, facenti parte di un elaborato meccanismo ad orologeria, ricoperte da oltre 2.000 caratteri di scrittura, dei quali circa il 95% è stato oggi decifrato.

Il “Meccanismo di Antikythera”, come è universalmente conosciuto, fin dalla sua scoperta è stato considerato come il più eccezionale tra i rinvenimenti archeologici dell'ultimo secolo, apparendo sin da subito alla comunità internazionale di storici e archeologi come un dispositivo fuori del suo tempo, che continua ancora oggi dopo anni di studio a stimolare un'accesa discussione tra scienziati a causa della complessità e della

modernità delle conoscenze scientifiche che l'opera presuppone. In particolare, nel corso dell'ultimo mezzo secolo le ricerche messe in campo hanno permesso di svelare gran parte dei segreti del "Meccanismo di Antikythera", oggi conservato nella collezione di bronzi del Museo Archeologico Nazionale di Atene, insieme alla sua ricostruzione, consentendo di appurare come il più sofisticato meccanismo sopravvissuto dall'antichità altro non fosse che un complesso "Elaboratore" per il calcolo dei fenomeni astronomici e dei cicli del Sistema Solare. I rotismi epicicloidali con cui è stato costruito evidenziano l'elevato livello della cultura scientifica raggiunto in età ellenistica. La conoscenza del moto planetario, necessaria per la progettazione del rotismo epicicloidale presente nel Dispositivo, fa presumere che alcuni scienziati del tempo fossero a conoscenza del calcolo del moto planetario dei corpi celesti e potrebbero aver conseguito gli stessi risultati raggiunti in epoca moderna: l'autore del Calcolatore di Antikythera potrebbe aver anticipato infatti di 19 secoli i risultati della legge della gravitazione universale formulata da Isaac Newton nel 1687 (*Philosophiae Naturalis Principia Mathematica*), potrebbe aver precorso ed utilizzato la teoria eliocentrica proposta da Niccolò Copernico nel 1543 (*De revolutionibus orbium coelestium*), anticipando nel contempo lo studio cinematico dei rotismi epicicloidali pubblicato da Robert Willis nel 1841 (*Principles of mechanism*).<sup>1</sup>

Tuttavia più della metà delle componenti del "Meccanismo di Antikythera" è ancora mancante, probabilmente giace tuttora sul fondo del mare. Una nuova spedizione condotta presso il celebre relitto dal team internazionale "Return to Antikythera", potrebbe essere in grado di portare alla luce alcuni dei frammenti mancanti, grazie soprattutto all'impiego delle più recenti tecnologie messe in campo dallo staff.<sup>2</sup>

Del resto negli ultimi cinquant'anni le ricerche condotte intorno al "Meccanismo" hanno fatto uso di ogni soluzione tecnologica disponibile per tentare di svelare i complessi misteri del Dispositivo: a partire dal 2005, una nuova iniziativa sta progredendo sul lavoro di ricerca svolto fino al 2000, utilizzando le più recenti tecnologie oggi fruibili. L'"Antikythera Mechanism Research Project" (AMRP)<sup>3</sup> ha confermato i risultati raggiunti nel 1974 dallo storico Derek de Solla Price: dopo venti anni di ricerca<sup>4</sup> egli fu in grado di dimostrare come i Greci fossero pervenuti ad un livello avanzato di tecnologia che raggiunse il suo apice nel "Meccanismo di Antikythera", il quale si era rivelato essere un vero "calcolatore analogico" astronomico gestito da una tecnologia avanzata che sarebbe apparsa in Europa solo nel XVI secolo. Il dispositivo a orologeria era stata una delle meraviglie tecnologiche dell'antichità, sviluppato nel background culturale ereditato da Archimede. Nel 2016 il team di scienziati dell'AMRP, servendosi di scansioni ad alta risoluzione, è riuscito a decifrare le lettere dell'iscrizione incisa all'interno del "Meccanismo", trovando indicazioni sull'uso specifico del Dispositivo: il "Meccanismo di Antikythera" si è rivelato essere un Calcolatore destinato al rilevamento di eventi astronomici, eclissi e date dei Giochi Olimpici.

Gli importantissimi risultati raggiunti dall'AMRP sono pubblicati secondo un piano stabilito che prevede la progressiva edizione degli stessi una volta che i dati acquisiti vengono elaborati ed analizzati.

Dalla pubblicazione dei primi risultati conseguiti dall'AMRP, apparsa su "Nature" nel 2006, come Atti della Conferenza Internazionale dedicata al "Meccanismo di Antikythera" <sup>5</sup>, siamo giunti, nel maggio del 2016 all'edizione del volume *The Inscriptions of the Antikythera Mechanism*, un lavoro di collaborazione curato da Mike Edmunds per la rivista "Almagest", che vi ha dedicato un numero speciale, sostenuto

dall'azienda "Hublot", dove sono stati raccolti i contributi degli studiosi autori di questa importantissima ricerca che ha permesso di stabilire con esattezza la natura del prezioso Dispositivo, attraverso la decifrazione delle iscrizioni superstitipresenti sul "Meccanismo".

La General Preface to the Publication of the Inscriptions, redatta dal team di ricerca dell'AMRP (M. Allen, W. Ambrisco, M. Anastasiou, D. Bate, Y. Bitsakis, A. Crawley, M.G.Edmunds, D. Gelb, R. Hadland, P. Hockley, A. Jones, T. Malzbender, H. Mangou, X. Moussas, A. Ramsey, J.H. Seiradakis, J. M. Steele, A.Tselikas, M. Zafeiropoulou) [pp. 5-35] riassume brevemente la serie di saggi contenuti nel volume che ripercorrono la storia della decifrazione del testo delle iscrizioni superstiti presenti sul "Meccanismo di Antikythera" (A. Jones, Historical Background and General Observations [pp. 36-66]) e descrivono la struttura del Calcolatore (Y. Bitsakis, A. Jones, The Front Dial and Parapegma Inscriptions [pp. 68-137]; M. Anastasiou, Y. Bitsakis, A. Jones, J. M. Steele, M. Zafeiropoulou, The Back Dial and Back Plate Inscriptions [pp. 138-215]; Y. Bitsakis, A. Jones, The Back Cover Inscription [pp. 216-249]; M. Anastasiou, Y. Bitsakis, A. Jones, X. Moussas, A.Tselikas, M. Zafeiropoulou, The Front Cover Inscription [pp. 251-297]). L'introduzione si sofferma anche sulle tecnologie utilizzate dall'AMRP per la decodifica delle immagini [pp. 15-18], la struttura e la disposizione sul Dispositivo delle incisioni [pp. 20-23] e la ricostruzione delle possibili effettive dimensioni del Meccanismo dedotte dalla stima dello spazio disponibile destinato ad accogliere le iscrizioni [pp. 24-32]. Supplementary Illustrations [pp. 299-310] completano in conclusione questo fondamentale lavoro, la cui Table of Contents and Abstracts è fruibile online all'indirizzo

#### Notes:

1. Giovanni Pastore, *Antikythera e i regoli calcolatori*, s.e., 2006; Idem, *Il Planetario di Archimede ritrovato*, Roma, 2010.
2. Una sola indagine ufficiale presso il relitto è stata autorizzata dopo il rinvenimento del 1901: nel 1976 il Ministero della Cultura greco ha concesso a Jacques Cousteau e all'equipaggio della Calypso di lavorare per diverse settimane presso il sito, sotto la supervisione dell'archeologo Dr. Lazaros Kolonas. Durante quelle immersioni l'equipaggio della Calypso e Cousteau, che aveva già avuto modo di visitare l'isola nel 1953 per soli tre giorni accompagnato dal professore del MIT Harold "Doc" Edgerton, hanno avuto modo di recuperare quasi più di 300 oggetti, tra cui resti scheletrici dei passeggeri e dell'equipaggio. Dopo quella spedizione non sono state compiute ulteriori immersioni presso il relitto fino al 2012, quando il Ministero della Cultura e dello Sport ellenico ha autorizzato una nuova campagna di indagine condotta dalla squadra di sommozzatori della Woods Hole Oceanographic Institution (WHOI) e dalla Soprintendenza alle Antichità subacquee ellenica, il "Return to Antikythera", team di ricerca internazionale, che il 31 agosto del 2016 durante gli scavi in corso presso il relitto ha portato alla luce uno scheletro umano: questo ritrovamento potrebbe dimostrarsi una scoperta importante poiché se abbastanza DNA vitale si è conservato nei resti, potrebbe essere possibile identificare l'etnia e l'origine geografica del naufrago e gettare nuova luce sul celebre relitto (si veda Return to Antikythera). Sul lavoro del gruppo di ricerca "Return to Antikythera" si veda il sito dedicato, dove è possibile fruire dei diversi modelli 3D dei resti del famoso naufrago.
3. "Antikythera Mechanism Research Project" (AMRP) è una collaborazione internazionale fra Istituzioni accademiche (fra tutte la Cardiff University – UK, le

Università di Salonicco e di Atene – Grecia, la National Bank of Greece Cultural Foundation ed il Museo Archeologico Nazionale di Atene; l’Institute for the Study of the Ancient World, New York, USA e la Brown University, USA; l’Università di Puget Sound, USA, l’Università di Quilmes, Argentina e l’Università di Waikato, Nuova Zelanda) con il supporto tecnologico offerto dalle maggiori industrie operanti nelle alte tecnologie (Hewlett-Packard e Team X-Tek), che mira a rivalutare completamente la funzione e il significato del “Meccanismo di Antikythera”. Una puntuale e precisa descrizione del lavoro svolto dall’ AMRP, delle risorse intellettuali e tecnologiche messe in campo e dei risultati raggiunti è fruibile online all’indirizzo Antikythera Mechanism Research Project.

4. Derek De Solla Price, *The Antikythera Mechanism, a Calendar Computer from ca. 80 B.C.*, (1974).

5. Tony Freeth, Yanis Bitsakis, Xenophon Moussas, John Hugh Seiradakis, Agamemnon Tselikas, Helen Mangou, Mary Zafeiropoulou, R. Hadland, D. Bate, Andrew Ramsey, Martin Allen, A.Crawley, P.Hockley, T. Malzbender, D.Gelb, W.Ambrisco, and Edmunds Mike, "Decoding the ancient Greek astronomical calculator known as the Antikythera Mechanism", *Nature*, n. 444, 11/2006, pp. 587-591, the Antikythera Mechanism Research Project: Publications.

**Please visit the site: <http://bmc.brynmaur.edu/2017/2017-03-11.html> [Go there for embedded links]**

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## **‘JOY PLANTS’ AND THE EARLIEST TOASTS IN THE ANCIENT NEAR EAST, BY ELISA GUERRA DOCE**

The Ancient Near East Today, March 2017: Vol. V, No. 3

Inebriation is a cross-cultural habit whose origins can be traced back to Prehistory. But humans are not the only species fond of the mind-altering effects of certain plants and drinks. Some animals are also attracted to overripe fruits and psychoactive plants. Orangutans, chimpanzees and other primates, elephants, and even birds, have been reported to over-indulge on fermented fruits. The image of an intoxicated moose in Sweden went viral in 2011, when the animal literally got stuck in an apple tree trying to eat more fermented fruits.

In their search for food early humans are likely to have come across plants and mushrooms with peculiar effects. The use of psychoactive plants, many of which are consumed raw, predates the consumption of fermented beverages. As yet there is no direct evidence of these practices during the Palaeolithic. The presence of ephedra, a natural stimulant, in a Neanderthal grave, ca. 60,000 BCE, in Shanidar Cave, northern Iraq, has been considered some of the earliest evidence for the use of mood-altering plants in the Old World. But since this Middle Palaeolithic burial cave has been disturbed in modern times by rodent activity this interpretation is debatable. There is also no direct evidence for the production of fermented beverages during the Neolithic before the invention of pottery, although the technological and technical prerequisites of brewing were well established during the Natufian of the Near East (ca. 12,500-9,500 BCE).

From the Neolithic onwards, however, there is no doubt regarding the consumption of psychoactive plants and alcoholic beverages. The domestication of the opium poppy probably started during the sixth millennium BCE in the Western Mediterranean, spreading from there to the rest of the Old World. Apart from its oily seeds, the exploitation of its narcotic properties cannot be ruled out. The earliest written records suggesting the use of the opium poppy date back to the third millennium BCE; Sumerians appear to have referred to it as Hul Gil, the ‘joy plant’, but this claim is still a matter of debate. But by the second millennium BC, there is considerable information evidence for the cultivation of the opium poppy and its ritual use in the Eastern Mediterranean. Among the most interesting examples of religious scenes from the Late Bronze Age Eastern Mediterranean (ca. 1600-1100 BCE) that include this plant species are a golden signet ring found by Heinrich Schliemann in the acropolis of Mycenae, and the so-called Poppy Goddess figurine from the Minoan sanctuary at Gazi.

Some scholars believe Sumerian and Assyrian tablets mention other psychoactive plants, including deadly nightshade, mandrake, and hemp. In contrast, Egyptian papyri contain uncontested evidence of the use of different psychoactive plant species from the middle of the second millennium BCE onward. Similar plant descriptions are included in the Bible, and this has given rise to the still controversial hypothesis that ancient Israelite religion was associated with the use of mind-altering plants in sacramental contexts. Nonetheless, there is direct evidence for the medicinal use of Cannabis in Roman times,



as indicated by the presence of charred seeds in the tomb of a 14-year-old girl excavated in Beit Shemesh, near Jerusalem, dating to the fourth century AD, probably used as an aide to childbirth.

Direct evidence of alcoholic drinks in the past is based on the identification of residues in the inner walls of archaeological vessels. Traces of the original contents of ancient pottery, invisible to the naked eye, may have been absorbed within the porous ceramic matrix of the vessels and may be detected and chemically identified. To date the earliest chemically confirmed alcoholic drink in the world was found at the Early Neolithic village of Jiahu, in the Yellow River Valley of China (Henan Province), ca. 7000–6600 BCE. Residues adhering to potsherds point to a mixed fermented beverage of wild grapes or hawthorn fruit (*Crataegus* sp.), rice (possibly a domesticated variety), and honey.

Similarly, wine may have been produced from wild grapes in the Caucasus region during the Neolithic, as suggested by the identification of tartaric acid in pottery jars of that period. Analyses of two ceramic vessels, found at the site of Hajji Firuz Tepe in the Zagros Mountains of north-western Iran, ca. 5400–5000 BCE, showed that they had contained a resinated wine with terebinth tree or pine resin added as a preservative and medicinal agent.

It has been argued that the wild Eurasian grapevine was domesticated somewhere in the arc of mountains extending from the eastern Taurus across Transcaucasia to the northwestern Zagros, since many archaeological sites from this region have provided grape seeds corresponding to the domesticated variety (*Vitis vinifera* L. subsp. *vinifera*). It should be noted that according to the Bible, Noah allegedly planted the first vineyard on Mount Ararat, located in eastern Turkey.

Not long after the domestication of grapes, wine was produced in large quantities in specialized facilities, such as the cave complex of Areni 1, a Chalcolithic site in south-east Armenia, dated to around 4000 BCE. Excavations have unearthed a fully equipped winery consisting of basins that could have served as wine presses where grapes were trodden, and also fermentation vats, storage jars, drinking bowls, and remains of domesticated grapes. Researchers working at the site believe that wine may have been made for mortuary practices, since 20 burials were found next to the winemaking facilities and drinking cups have been found inside and around the graves.

Modern impression of a Sumerian cylinder seal from the Early Dynastic III period (ca. 2600-2350 BC): Banquet scene with seated figures drinking from a large vessel using long stalks (The Metropolitan Museum of Art).

The consumption of alcohol in ancient civilizations of the Near East is well attested to from the fourth millennium BCE through iconographic representations of drinking scenes, archaeochemical analyses of pottery sherds, and later on also through texts dating from the second millennium BCE (such as The Epic of Gilgamesh, The Hymn to Ninkasi, the Sumerian goddess of brewing and beer, the Egyptian Book of the Dead, and others). Beer and wine were produced on a large scale, traded along the Mediterranean (as revealed by residue analyses on some amphoras from the Late Bronze Age Uluburun shipwreck), and their consumption was quickly associated with ritual ceremonies.

Beer, weed, wine, opium? It seems that ancient inhabitants of the Near East had a rock and roll lifestyle! Actually, it was quite the contrary, the consumption of psychoactive substances in the ancient Near East differed dramatically from that image. Our predecessors managed to make their use beneficial to society by integrating drug plants and alcohol into social, religious, and medicinal practices. The mind-altering effects of these agents were interpreted as part of a religious experience. Not surprisingly, then, wine had a significant role in Judaism and came to symbolize the blood of Christ for Christians.

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Please visit the site: <http://asorblog.org/2017/03/07/joy-plants-earliest-toasts-ancient-near-east/> [Go there for pix]

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## **THE PRACTICE OF REPAIRING VESSELS IN ANCIENT EGYPT: METHODS OF REPAIR AND ANTHROPOLOGICAL IMPLICATIONS**

Near Eastern Archaeology Vol. 79, No. 4, December 2016 article, “The Practice of Repairing Vessels in Ancient Egypt: Methods of Repair and Anthropological Implications,” by Julia Hsieh (University of Auckland).

Renewed excavations on the tell of Achziv in the north of Israel by a French-Israeli team have led to the discovery (in July 2016) of a very rare find: a clay anthropomorphic mask mold. This object comes from a layer dated to the tenth or ninth century B.C.E. Clay masks are characteristic of Phoenician culture, but the actual mask molds that produced them have been lacking until now. This article discusses the context and possible uses of this remarkable find.

Please visit the site: <http://buff.ly/2mlJXzR> [The article is free to download using your email address.]

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## **POTTERY PRODUCTION TECHNOLOGY AND LONG-DISTANCE EXCHANGE IN LATE NEOLITHIC MAKRYGIALOS, NORTHERN GREECE, ELISSAVET S. HITSIOU**

This book investigates the production technology and inter-site circulation of a large and diverse Late Neolithic ceramic assemblage from the flat-extended settlement of Makrygialos (Phase II), in northern Greece. Comparative samples from Dimini, in Thessaly, and Agrosykia A and Giannitsa B, in western Macedonia, are also incorporated. It draws conclusions from the use of macroscopic and petrographic analysis of a large number of samples in an integrated project. The new evidence offers a better understanding of the role of technological choice in ceramic production. Locally produced and imported ceramic categories are found to co-exist. They signify manufacture by different groups or individuals with varying degrees of technological knowledge and skill, probably producing in different places, and within distinct ceramic traditions. More importantly, petrographic analysis provides positive evidence of the long-distance exchange of pots, challenging previously established ideas on the circulation of pottery for this period and geographical area. The emerging picture strongly supports the idea of a dynamic Neolithic society characterised by mobilities, interaction and social competition between people, as revealed through their material culture.

**Elissavet S. Hitsiou** studied archaeology at the Aristotle University of Thessaloniki, Greece, and received her PhD from the University of Sheffield, England, working on Neolithic pottery from northern Greece. At a post-doctoral level, she investigated late classical Mendean-type transport amphorae from northern Greece at the Wiener Laboratory, the American School of Classical Studies at Athens. She was later employed as Assistant Professor at the University of Amsterdam, the Netherlands. She has worked as an archaeologist for the Greek Archaeological Service and as a pottery expert in several research projects (e.g. in Mycenae, Avgi, in Kastoria, Greece).

**Keywords:** Late Neolithic pottery, Production technology, Exchange, Petrographic analysis, Interaction, Mobilities, Makrygialos, Northern Greece

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## **EΙΔΗΣΕΙΣ - NEWS RELEASE**

# **ARCHAEOLOGISTS UNCOVER VAST ANCIENT ROMAN MINING OPERATION IN SPAIN**

The Romans exploited an even more ancient mine but built elaborate ventilated underground galleries, going deeper than had been thought possible at the time.

Philippe Bohstrom

Archaeologists excavating the ancient city of Munigua in southern Spain have found a vast Roman copper mining operation built on an older mine dating back thousands of years.

Exploitation of ore at Munigua apparently began by the Turdetani, the original inhabitants of the region, over 4,000 years ago. Now the excavators have discovered an elaborate system of ventilated underground galleries connected by tunnels dating to the Roman era.

They also found shafts connecting at various heights forming floors that let the miners extract metal deeper than had been believed possible at the time. Happily for the miners, the ancient Romans were on to the secret of ventilation.

The Munigua mine supplied the Roman Empire with vast amounts of iron and copper until the late second century C.E., when all the mines in Hispania were shut down.

### **The Vespasian cult**

The earliest evidence for actual settlement at Munigua, as opposed to mining operations, is Greek ceramics from the fourth century B.C.E. Archaeologists believe that the first settlement was established by the Turdetani. By the time the Romans conquered it for its mines, the city was apparently already a major hub.

Archaeologists digging there since 1956, most recently from the German Archaeological Institute in Madrid, have found temples, smaller sanctuaries, a two-story hall, a forum, thermal baths, city walls and a vast necropolis.

The monumental terrace sanctuary at Munigua has been known all along, going by drawings from the 18th century; historical sources refer to it as the Castle of Mulva.

### **The Castle of Mulva at Munigua, Spain. Íñigo López de Audicana**

Exactly what divinity was adored there remains uncertain, although it may well have served the cult of the emperor (Fortuna Augusta and Hercules Augustus). Certainly the monumental sanctuary atop the 150-meter-high hill had to be constructed to worship somebody vastly important such as the emperor himself.

“This type of terrace sanctuary is found in republican Latium – the region around Rome. Here in Munigua we have the only example of this monumental architecture in

Hispania," says Prof. Thomas G. Schattner, director of the Madrid office of the German Archaeological Institute and head of the excavations.

### **Valuable enough to kill for**

It was partly pursuit of valuable metals that motivated Rome to invade places as far-flung as Israel. Certainly the ancient copper mines in today's southern Israel stepped up production during the Roman occupation.

In Spain too the Romans didn't introduce mining, they exploited mines already in use. But first they had to overthrow the mines' new overlords, the Carthaginians.

Copper and iron had been mined in Andalusia for over 4,000 years. Come the late third century B.C.E., the Punic general Hamilcar Barca of Carthage set out to expand his empire and founded Carthago Nova (New Carthage) on Spain's southeast coast. He also took over the mines of Munigua.

Within mere years, the Spanish mines had refilled the original Carthage's coffers.

Inevitably, the Punic ambitions led to conflict with Rome. In 218 B.C.E., the Roman commander Cornelius Publius Scipio landed on the Iberian Peninsula with a Roman army and targeted the mines, including those in New Carthage and Castulo, in an attempt to cut off Carthage's metal supply and strangle its economy.

In a daring attack, when the water in the harbor had dropped lower than usual, 500 Roman soldiers waded ashore and, passing the forts, conquered New Carthage. From that point things went steadily backward for the Carthaginians in Spain.

Over a hundred years later, in the second century B.C.E., metal again began to be mined massively, which ancient authors link with massive migration from Italy to Hispania – the Roman name for the Iberian Peninsula.

We know that metal production enormously increased partly from vast slag deposits in Munigua, some the size of football fields. This has much to do with our knowledge of their mining operations.

"Slag is a first-class archaeological source material, as it can be analyzed and can give precise information about the metal melted, the process by which melting was achieved and the chemical characteristics of the metal," Schattner told Haaretz.

### **Romanizing Hispania**

The Romans did more to make Spain their own, and while about it, knew how to make the most of mountainsides. In Munigua, on the second terrace halfway up the hill, the archaeologists found a tetrastyle temple with a podium, probably dedicated to the Roman god Jupiter. A temple of Mercury is situated beside a two-story porticus and a nymphaeum (a monument consecrated to the nymphs, usually situated in public bathhouses).

The lower terrace was the true nerve center of the city. Here the archaeologists uncovered a square plaza with porticoes, surrounded by public buildings, among them the curia and tabularium. The curia was the place where the inhabitants of the town discussed their affairs, and the tabularium was where official state documents were stored.

Two inscriptions carved on bronze tablets were found in the forum. One, dating to the Augustan period, is a hospitium-treatise in which Munigua accepts the control of its Roman patron Sextius Curvius Silvinus. The second is from Emperor Titus to the city, dated September 79 C.E.

Baths found on the lower terrace dating to the time of Nero still have intact stucco on the walls, and an arched ceiling. The floors of the frigidarium (cold bath) and the tepidarium (warm bath) were found fully preserved, with bricks laid in a herringbone pattern.

A dozen houses were discovered, half of which have been excavated. All date to Vespasian's development of the city, which began around 70 C.E. The archaeologists also found two necropolises, one featuring richly decorated coffins and another cut into the rock containing urns that would have held cremated bodies.

Yet for all Munigua's great development, the large-scale Roman ore extraction seems to mark the end of the settlement.

In the third century C.E., a hiatus is observed, perhaps originating in a massive earthquake that left buildings in ruins from which Munigua seems to have never fully recovered. The city would have inhabitants for another 300 years, but no new building program seems to have been undertaken.

By the late sixth century C.E., the place seems to have been all but abandoned. A few pieces of Islamic ceramics attest that some life remained, but not much, and not for long.

**Please visit the site: <http://www.haaretz.com/archaeology/1.774629>**

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## **4,000-YEAR-OLD STRUCTURE WITH MYSTERIOUS ENGRAVINGS DISCOVERED IN GALILEE, BY DANIEL K. EISENBUD**

"This is the first art ever documented in a dolmen in the Middle East," says archeologist.

A 4,000-year-old table-like stone structure, known as a dolmen, inscribed with unprecedented mysterious art, was recently discovered next to Kibbutz Shamir in the Upper Galilee.

According to the Israel Antiquities Authority, the structure from the Bronze Age was initially found by Professor Gonen Sharon of Tel Hai College's Galilee Studies Program.

"What makes this dolmen so unique is its huge dimensions, the structure surrounding it, and most importantly, the artistic decorations engraved in its ceiling," the IAA said on Sunday.

Archeologists from Tel Hai College, the Authority, and the Hebrew University of Jerusalem published a study on the find last weekend in the scientific journal PLOS One.

A dolmen is a millennia-old megalithic structure built of huge stones. The basic shape of the dolmen resembles a table, and most of them are surrounded by a heap of stones.

Dolmens have been found elsewhere in the world, from Ireland to Korea. Thousands of dolmens are scattered across the Middle East, from Turkey to Yemen. In the Golan Heights, thousands of different types, scattered in concentrations known as "dolmen fields," have been identified.

Although they are very common and stand out quite prominently in the landscape of ancient Israel, the mystery surrounding the dolmens' age and their purpose have still not been resolved.

"It is just one of more than 400 huge stone structures dating to the Intermediate Bronze Age (over 4,000 years ago) that are located in the dolmen field around Kibbutz Shamir," the Authority said.

"When Professor Sharon entered the chamber built beneath the largest dolmen, he was surprised to discover rock drawings engraved in its ceiling."

The discovery of the engravings led to a joint research project of the dolmen and its environs, which produced new revelations concerning the dolmen phenomenon in Israel.

"This is the first art ever documented in a dolmen in the Middle East," said Uri Berger, an IAA archeologist with the Israel Antiquities Authority and partner in the study.

"The engraved shapes depict a straight line going to the center of an arc. About 15 such engravings were documented on the ceiling of the dolmen, spread out in a kind of arc

along the ceiling. No parallels exist for these shapes in the engraved rock drawings of the Middle East, and their significance remains a mystery.”

The panel depicting the art was scanned in the field by the Computerized Archeology Laboratory of the Hebrew University, which created a innovative three-dimensional model of the engraving.

“The three-dimensional scan enabled us to identify engravings that otherwise could not be seen with the naked eye,” explained Professor Lior Grossman, the laboratory director.

“The chamber inside the dolmen, where the engravings were found on its ceiling, is large, measuring 2 × 3 meters, and the stone covering it is also huge, weighing an estimated 50 tons at least! This is one of the largest stones ever used in the construction of dolmens in the Middle East.”

Grossman added that the dolmen was enclosed within an large stone heap (tumulus) 20 meters in diameter, with stones estimated to weigh 400 tons.

“At least four smaller dolmens that were positioned at the foot of the decorated dolmen were identified inside the stone heap,” he said. “In other words, what we have here is a huge monumental structure built hierarchically (with a main cell and secondary cells). This is the first time such a hierarchical dolmen has been identified in the Middle East.”

The large dolmen found at Kibbutz Shamir is just one of hundreds of enormous densely scattered structures in this region, he said.

“It bears witness to the existence of a significant and established governmental system in the region during the ‘Middle Ages’ of the Bronze Age,” said Grossman. “Archeologists tend to interpret the past based on material finds. The absence of cities, large settlements and monumental buildings attests to the collapse of the governmental and economic systems during a dark period in history.

“The dolmens tell a different story about the period – a story about a society that had a complex governmental and economic system that executed monumental engineering projects, but did not leave behind any other archeological evidence.”

Professor Sharon, who first discovered the structure, noted that the dolmen is undoubtedly an indication of public construction.

“[This] required a significant amount of manpower over a considerable period of time,” he said. “During that time, all of those people had to be housed and fed. The building of such a huge construction necessitated knowledge of engineering and architecture that small nomadic groups did not usually possess.

“And even more importantly, a strong system of government was required here that could assemble a large amount of manpower, provide for the personnel, and above all, direct the implementation and control of a large and lengthy project.”

Despite all this, the circumstances surrounding the construction of the dolmens, the technology involved in it, and the culture of the people who built them are still one of the great mysteries of the archeology of Israel.

The dolmen field at Kibbutz Shamir was first surveyed by the late Moshe Kagan in the 1950s. More than 400 huge structures overlooking the Hula Valley were identified in the field.

Please visit the site: <http://www.jpost.com/Israel-News/4000-year-old-structure-with-mysterious-engravings-discovered-in-Galilee-483256> [Go there for pix]

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**DUCKS, NOT PHALLUSES, REAL STARS OF  
1,900-YEAR-OLD FIND IN NORTHERN  
ISRAEL - ARCHAEOLOGIST AT ROMAN  
SETTLEMENT OF OMRIT, NEAR HULA  
VALLEY, SAYS PHALLIC FIND THAT  
GRABBED HEADLINES PALES IN  
COMPARISON TO PASTORAL FRESCOES  
DISCOVERED AT ROMAN MANOR,  
BY ILAN BEN ZION**

Stunning pastoral frescoes from a 1,900-year-old building have been uncovered following excavations at the site of an ancient Roman temple in northern Israel.

The discovery at Horvat Omrit points to the presence of a wealthy Roman community during the first and second centuries CE, the period when Judea was engulfed by two major Jewish revolts against Rome.

Omrit sits atop a hill at northern end of the Hula Valley at the very northern end of the Galilee, and is considered one of the best preserved, if lesser known, Roman imperial sites in the country.

The tantalizing find was made by an expedition co-directed by Daniel Schowalter, a professor of religion and classics at Carthage College, during excavation work during the summer of 2016.

He described the new discovery at a meeting of the Archaeological Institute of America and the Society for Classical Studies in Toronto in January.

The site is best known for a Roman temple, discovered soon after excavations began in 1999.

While excavating the settlement surrounding the temple in June, Schowalter and his team stumbled across the frescoed room.

In the room they found a broken fountain with “a really nicely painted fresco of a nature scene with ducks floating on the water and fish swimming underneath and plants and everything else.”

“Apart from that fountain, the walls of the room have a pattern that looks like a lattice fence, and if you look through the lattice fence you see in the background trees, bushes, leaves, maybe some birds,” he told The Times of Israel in a telephone interview.

“It’s really cool because clearly they were trying to portray that you were looking through a fence into a garden.”

“Somebody spent a lot of time making the room look very, very nice,” Schowalter said.

“Presumably this room is part of a house, but so far all we have is the room, so it’s a little hard to know exactly,” he said. The structure may have served as the residence of the temple’s caretakers, or as the home of Roman officials or local elites in the first and early second century CE.

“We can’t say who it would have been, but certainly there would have been people of substance, people with money in the region,” Schowalter said. The inhabitants were Roman, and thus far there has been no evidence of Jewish presence found at the site.

The room is situated to the north of the temple, and there’s a long porticoed structure, known as a stoa, dating to the third century CE that was built atop it.

“Over the last couple of years we discovered that it was built over earlier remains, earlier buildings,” Schowalter explained. “This room is part of that earlier building activity.”

When the ancient builders at Omrit lay the foundations for the stoa, they filled in the existing houses with rubble. In the fill were found little terra cotta phalluses, Roman amulets.

While the phalluses grabbed headlines recently, Schowalter downplayed their significance.

“They’re very small, about three centimeters (just over an inch) long, and one is complete and the other is broken,” he said. “It’s a pretty simple find, and we frankly don’t know where it came from because it was part of the fill. It was basically dumped in.”

Phallic amulets were commonly used by Romans to ward off the evil eye, referred to in Latin as fascina. They were etched into stones at crossroads, hung as pendants around the necks of children, and placed in gardens and hearths for totemic protection.

The building’s proximity to Caesarea Philippi, also known as Paneas for its sanctuary to the god Pan, leads archaeologists to believe that it was closely affiliated with that town.

Paneas sat at a major crossroads, and the temples and houses at Omrit sat to the south, on the road running down to the Sea of Galilee, making it “a pretty important spot,” Schowalter said.

The full details of the frescoed walls found at Omrit will be published once researchers have a chance to study them in greater detail.

Excavations at Omrit began in 1999, headed by J. Andrew Overman of Macalester College in St. Paul, Minnesota, who first found the Roman temple at the site.

Based on the size of the exposed podium, Overman posited that the temple was probably around 15-20 meters high, making it a comparable size and shape to the Maison Carree in Nimes, France, one of the best preserved Roman temples remaining, which dates to around the same period.

Later excavations found there were three temples at the site, built one on top of the other. The remains of the buildings encapsulate “a microcosm of architectural development” in the region over the centuries, from Near Eastern to Hellenistic to Roman styles, a 2015 report on Omrit said.

“It’s a little bit difficult to pin down the dating of the building, and we don’t know for sure to whom it was dedicated,” Schowalter said, but he and his colleagues believe that based on its architecture and style, the second phase of the temple may have been the temple Josephus mentions King Herod erected in honor of Augustus Caesar in the first century BCE.

“We can’t prove that, and some people agree with us and some people disagree with us, but that’s our best estimation,” he said.

Schowalter’s excavation of the settlement surrounding the temple complex that led to the frescoed room find began in 2012.

The Omrit Settlement Excavations Project is co-directed by Schowalter, along with Jennifer Gates-Foster of the University of North Carolina, Chapel Hill; Michael Nelson from Queens College, City University of New York; Benjamin Rubin, an independent researcher; and Jason Schlude of the College of Saint Benedict & Saint John’s University.

The team plans to return to Omrit for its final season in a five-year series of excavations this June. Schowalter hopes to glean more information about the third century stoa-like building, as well as explore the building where the frescoes were discovered last year and learn more about it.

If they’re lucky, he hopes to find more paintings.

**Please visit the site: <http://www.timesofisrael.com/ducks-not-phalluses-real-stars-of-1900-year-old-find-in-northern-israel/> [Go there for pix]**

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## **PREVIOUSLY UNTOUCHED 600BC PALACE** **DISCOVERED UNDER SHRINE** **DEMOLISHED BY ISIL IN MOSUL,** **BY JOSIE ENSOR**

Archaeologists documenting Isil's destruction of the ruins of the Tomb of the Prophet Jonah say they have made an unexpected discovery which could help in our understanding of the world's first empire.

The Nebi Yunus shrine - containing what Muslims and Christians believe to be the tomb of Jonah, as he was known in the Bible, or Yunus in the Koran - was blown up by Islamic State of Iraq and the Levant (Isil) militants soon after they seized huge swathes of northern Iraq in 2014.

The shrine is situated on top of a hill in eastern Mosul called Nebi Yunus - one of two mounds that form part of the ancient Assyrian city of Nineveh.

But local archaeologists have told the Telegraph that Isil also dug tunnels deep under the demolished shrine and into a previously undiscovered and untouched 600BC palace.

Limited excavation was carried out by the Ottoman governor of Mosul in 1852, which was revisited by the Iraqi department of antiquities in the 1950s. But neither team reached as far as the palace.

It is the first evidence of Isil's use of tunneling in ancient grounds in their hunt for artefacts to plunder.

Inside one of the tunnels, Iraqi archaeologist Layla Salih discovered a marble cuneiform inscription of King Esarhaddon thought to date back to the Assyrian empire in 672BC.

While the king's name is not visible on the cuneiform slab, a historian who has seen photographs of it says phrases are legible which were used only to describe him, in particular his rebuilding of Babylon after his father Sennacherib had it destroyed.

The palace was built for Sennacherib, renovated and expanded by Esarhaddon (681-669 BC), and renovated again by Ashurbanipal (669-627). It was partly destroyed during the Sack of Nineveh in 612 BC.

There are only a handful of such cuneiforms recovered from the period, most of which from the second mound just north of Nebi Yunus in Kouyunjik.

In another part of the tunnel they discovered Assyrian stone sculptures of a demi-goddess, depicted sprinkling the "water of life" to protect humans in her care.

"I've never seen something like this in stone at this large size," said Prof Eleanor Robson, chair of the British Institute for the Study of Iraq, suggesting they may have been used to decorate the women's quarter of the palace. "The objects don't match



descriptions of what we thought was down there, so Isil's destruction has actually led us to a fantastic find.

“There's a huge amount of history down there, not just ornamental stones. It is an opportunity to finally map the treasure-house of the world's first great empire, from the period of its greatest success.”

Ms Salih, a former curator of the Mosul museum who is supervising a five-man team carrying out the emergency documentation, said she believes Isil looted hundreds of objects before Iraqi forces recaptured the eastern side of the city.

“I can only imagine how much Daesh discovered down there before we got here,” she told the Telegraph by phone from Mosul. “We believe they took many of the artefacts, such as pottery and smaller pieces, away to sell. But what they left will be studied and will add a lot to our knowledge of the period.”

She warned that the tunnels were not professionally built, however, and are at risk of collapsing “within weeks” - burying and potentially destroying the new finds.

Experts from the British Institute for the Study of Iraq - alongside other international teams - are bidding to help local archaeologists secure and document the site. Unesco is due to hold a meeting in Paris later this month to decide who will be sent.

The terror group destroyed several other key landmarks in Mosul and elsewhere because they considered the worshipping of shrines not to be in keeping with their Islamic traditions. Isil militants believe giving special veneration to tombs and relics is against the teachings of Islam.

A report just released by the Iraqi Kurdistan regional government lists some 100 sacred buildings damaged or wiped off the map during Isil's two-year reign.

They closed all of Mosul's museums and cultural centres during their more than two-year reign over the city. Many of the city's archaeologists and historians went into hiding.

“Many decided to stay in the city when Isil came, fearing what they might do to their families if they fled,” said Prof Robson. “They hid their books and lied about their expertise. Thankfully, most of them survived.”

**Please visit the site: <http://www.telegraph.co.uk/news/2017/02/27/previously-untouched-600bc-palace-discovered-shrine-demolished/>**

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## **MORE ON REDISCOVERED NINEVEH PALACE**

Did ISIS inadvertently uncover the secret to the “lost” Hanging Gardens of Babylon?

ISIS destroyed an ancient shrine — and archeologists may have discovered a wonder of the ancient world underneath

Last week, a group of concerned archaeologists, mapping out the extent of the damage wrought by ISIS when it occupied the Iraqi city of Mosul, announced a shocking discovery. In 2014, the terrorist group had gleefully announced its destruction of the Nebi Yunus shrine, traditionally believed to be the tomb of the Prophet Jonah and a part of the ancient ruins of the city of Nineveh.

In February the Iraqi army drove ISIS from Mosul, giving archaeologists their first chance to inspect the devastation. ISIS’ funding of its activities through the sale of illicit antiquities has been well-documented. Anything ISIS might find, in the course of plowing through ancient sites, would be gathered for sale abroad, while the militants would destroy as much as they could along the way, documenting the harm in order to upset their ideological enemies.

At first there was little concern that Nineveh would yield salable artifacts. It had been carefully excavated by waves of archaeologists since at least 1842. The only chance of finding new treasures would be to search where no one has looked before. And the only place that no one has looked, where archaeologists would not try to look, would be places that can be accessed only by blowing up or bulldozing the already-revealed parts of the ancient city.

To the surprise of the archaeologists, upon examining the reconquered city, they found evidence that when ISIS blew up parts of the Nebi Yunus shrine, the militants unveiled a major discovery: a palace that predated the Tomb of Jonah and had been buried beneath it — unseen for thousands of years.

In terms of exposing history, this is a major find. But ISIS arrived there first and, as archaeologist Layla Salih said, “I can only imagine how much [ISIS] discovered down there before we got here.” On the other hand, optimism was re-injected when she and her team found some items of great interest (and value) that had not been taken. For example, there is an inscribed piece of marble with cuneiform that includes turns of phrase used elsewhere exclusively to describe a specific king, Esarhaddon, who was a ruler of Assyria circa 672 B.C.

This suggests that the newly discovered palace from the 7th century B.C. is one that historians knew about but had thought long lost — one begun by King

Sennacherib and completed by his son, Esarhaddon. This palace was so badly damaged during the 612 B.C. sack of Nineveh, amid a loss at the hands of an allied army that ended the Neo-Assyrian Empire, that it was never occupied again. Components of it were reused in other, new structures (buildings like the Tomb of Jonah), once the city was reconstructed.

But the story doesn't end there. It is, in fact a poetically linked component in a chain of lost monuments and ancient kings, dating back to one of the Seven Wonders of the Ancient World, the only one that historians have wondered if it ever existed at all.

You can still visit the Great Pyramid at Giza today. But all the other Seven Wonders are known to have been destroyed — except for the Hanging Gardens of Babylon. The presence and loss of the others — The Tomb of Mausolus, the Lighthouse of Alexandria, the Temple of Artemis at Ephesus, the Colossus of Rhodes, the Statue of Zeus at Olympia — have been accounted for in archaeological and historical documentation.

The gardens were meant to have been a series of tiers, a sort of ziggurat-like step pyramid planted with all manner of greenery at each level, but also lined with colonnades. Because there are no known Babylonian texts that refer to the gardens (which is odd considering how magnificent and noteworthy they were), some have thought they might be just a legend.

The idea of seeing the Seven Wonders was popularized by ancient Greek and Roman travel writers. But they were describing wonders that were ancient to them, centuries old, and writing circa 100 B.C. to 100 AD. Thus their own knowledge was based on hearsay, rather than firsthand examination.

**Please visit the site: <http://www.salon.com/2017/03/12/did-isis-inadvertently-uncover-the-secret-to-the-lost-hanging-gardens-of-babylon/>**

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## **ISRAELI ARCHAEOLOGISTS DISCOVER ANCIENT CRUSADER SHIPWRECK, BY MENACHEM REPHUN**

The wreckage of a Crusader ship dating back to the 13th century C.E. has been discovered in the Northern Israeli city of Acre.

During the Middle Ages, Acre served as a landing point for thousands of Christian soldiers attempting to wrest control of the Holy Land from Muslim forces. The Crusaders ultimately succeeded in reclaiming Jerusalem in 1099 and established a kingdom reaching from Lebanon to the Gulf of Aqaba. This empire was short-lived. In 1187, Jerusalem was once again recaptured by the Muslim Sultan Saladin, after which Acre was established as the Crusader capital.

According to a Haaretz report Friday, a team of archaeologists led by Dr. Deborah Cvikel, Dr. Ehud Galili, and Prof. Michael Artzy of Haifa University discovered gold coins dating to 1291 C.E., the year of Acre's destruction by Egypt's Mamluk Sultanate.

In its report, Haaretz noted that the only parts of the shipwreck remaining were the keel, sections of the wooden hull, and a few wood planks. Archaeologists also discovered ceramic jugs and bowls underwater, the latter imported from Syria, Cyprus, and Southern Italy.

Thirty gold coins discovered by the archaeologists are connected to the Crusaders' failed attempt to prevent over 100,000 Muslim foot soldiers and cavalry from expelling them from the Holy Land. The wealthier Christian civilians used their gold and jewelry to bribe small boat owners to ferry them to safety. After their victory, the Mamluks dismantled much of Acre to prevent the Crusaders' return.

The Crusades were an incredibly dark period in Jewish history, as the "holy" warriors enthusiastically put Europe's Jews to the sword, slaughtering around 800 alone in the German city of Worms in May 1096, according to Jewish Virtual Library.

"The undisciplined mobs accompanying the first three Crusades attacked the Jews in Germany, France, and England, and put many of them to death, leaving behind for centuries strong feelings of ill will on both sides," Jewish Encyclopedia.com writes.

Please visit the site: <http://jpupdates.com/2017/03/10/israeli-archaeologists-discover-ancient-crusader-shipwreck-in-acre/> [Also at <http://www.haaretz.com/archaeology/.premium-1.776208>, requiring subscription]

## **HUMANS 'DOMESTICATED' MICE 15,000 YEARS AGO, BY JASON BITTEL**

Ancient rodent populations may now help us fill in gaps in the archaeological record as humans shifted from hunter-gatherers to farmers.

The house mouse has been hanging around humans for far longer than we thought.

Most people are all too familiar with house mice. We know them as the eaters of crumbs, gnawers of cords, and leavers of droppings. They create the pitter-patters we hear in the night and the messes we find in the morning.

Conventional wisdom has said that mice and people began living together when humans learned to farm. But new research published today in the Proceedings of the National Academy of Sciences suggests that our relationship with these rodents may be even more ancient.

By studying the fluctuations of house mouse fossils found in archaeological sites in the eastern Mediterranean, scientists have revealed that *Mus musculus domesticus* first cozied up to humans around 15,000 years ago.

That would be about 3,000 years before the advent of agriculture.

The findings offer an unusual glimpse into a murky period of human development, since the abundance of house mouse teeth seems to track with our nomadic ancestors' early experiments in settling down.

That makes the new study "a nice example of how house mouse research can be helpful for studying our own history," says Miloš Macholán, an evolutionary biologist and co-author of *The Evolution of the House Mouse*.

For example, scientists studying the transition from the hunter-gatherer lifestyle to agriculture may now be able to fill in gaps in the archaeological record by looking for the presence and proportions of mice molars, he says.

"I'd say it's important to understand that mice have been accompanying us for a very long time," says study leader Lior Weissbrod, a zooarchaeologist at the University of Haifa in Israel. "We've been changing them and they've been changing us in ways that are not immediately apparent."

### **A TALE OF TWO MICE**

The new study examines the rise of the house mouse in the Levant, an area that today encompasses parts of Israel, Lebanon, and Syria. Here, researchers previously found archaeological sites left by the Natufian culture of hunter-gatherers roughly 15,000 years ago.

By examining fossil teeth found at these sites, the team discovered that the house mouse's story is deeply intertwined with that of another closely related mouse species named *Mus*

macedonicus. More commonly called the short-tailed mouse, this rodent is considered to be more wild and less tolerant of humans.

As the Natufian hunter-gatherers started to become more sedentary, likely as a result of favorable climate conditions, the team found a rise in the amount of house mouse molars in and around human settlements.

Weissbrod says the critters were probably attracted to the small caches of wild grains the humans had to store to survive without constantly moving from place to place. (Also read "New Clues on How and When Wolves Became Dogs.")

What was a boon for house mice, though, seems to have been a detriment to the meeker short-tailed mice. As house mouse molars start to pile up during periods of prolonged human habitation, short-tailed mice molars all but disappear.

However, when the climate shifted again and the region became cold and dry, the Natufians reverted to their original way of life, only staying in one place as long as the resources nearby could support them. During these spells, the researchers found that the more independent short-tailed mice become dominant once again.

#### **A MODERN ANALOG**

The link between such human settlements and house mouse fluctuations became even clearer when the team compared their fossil results to mouse populations around today's hunter-gatherers.

The Maasai of southern Kenya still practice a semi-mobile lifestyle, herding cattle to different areas depending on the season. Like the ancient Natufians, the modern Maasai live in proximity to two closely-related mouse species, *Acomys wilsoni* and *Acomys ignitus*.

Weissbrod and his colleagues set up rodent traps in and around Maasai settlements. While populations of the two rodents were nearly equal in these areas, the traps inside Maasai homes caught far more *A. ignitus* (87 percent) than *A. wilsoni* (13 percent).

This was astonishing, says Weissbrod, because they observed almost the exact same ratio between house mice (80 percent) and short-tailed mice (20 percent) from the Jordan Valley site of Ain Mallaha, a Natufian settlement that dates to between 12,000 and 13,000 years old—placing it in between the time periods of nomadic life and the earliest farmers.

"This then gave us the key that we needed to make sense of varying mouse proportions in all of our other samples from both earlier and later periods," says Weissbrod.

The findings are "very cool and exciting," says Keith Dobney, a bioarchaeologist at the University of Liverpool, because they provide a "new, detailed window on the past."

Not only does the research show that the house mouse out-competed another mouse species by developing a one-sided relationship with humans, the authors have also tracked the fits and starts that eventually led to a sedentary lifestyle for hunter-gatherers in the Levant, simply by following the rodent's rise and fall.

The relationship between humans and mice is still continuing to evolve, of course. Some people keep the docile domesticated mice as pets, and there's an argument to be made that we owe the little squeakers our thanks for their enormous role in biomedical research.

Whether you feel ambivalence, ire, or gratitude, it seems our relationships with mice are as complex as they are ancient.

Please visit the site: <http://news.nationalgeographic.com/2017/03/house-mouse-domesticated-humans-animals-science/> [Go there for pix]

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## **2,500 YEARS OLD LUXURIOUS GREEK PALACE UNCOVERED BY ARCHAEOLOGISTS IN ANCIENT POSEIDONIA**

The discovery of a monumental building and priceless ceramics imported from Greece in excavations at Poseidonia shows for the first time how rich its Greek founders were when establishing the city in Italy in the 6th century B.C.E., Haaretz reports

The founders hailed from Sybaris, near the gulf of Taranto. The quantity of Attic red-figure pottery and other luxuries attest to fabulous wealth the city's Greek inhabitants made, apparently from pilgrims coming to worship at its temples.

The block-built structure, which could be a palace or simply a very rich house, seems to date to the same decades in which the temples and the famous "Tomb of the Diver" were built in the town, excavation leader Dr. Gabriel Zuchtrigel told Haaretz.

Indeed, Poseidonia, also called Paestum, is perhaps best known for its splendid, well-preserved Doric-style temples seen in the classic 1963 Ray Harryhausen movie "Jason and the Argonauts," where the Greek hero, played by Todd Armstrong, liberates the blind soothsayer Phineas from the tormenting Harpies. Back then, 2,500 years ago, Poseidonia was one of the most important sanctuaries in Magna Graecia (today's southern Italy). The Temple of Athena, dating to the 6th century B.C.E. and the Temple of Poseidon, dating to 460 B.C.E., were major attractions for pilgrims and an important source of employment for the city's inhabitants.

The town gradually grew between these two sanctuaries, but until recently visitors could for the most part only observe the Roman town that started to spring up in the mid 3rd century B.C.E... Now the archaeologists are opening up a window into the life of the city at the time when the magnificent temples were built, somewhere around the 6th century B.C.E."

The aim of the excavations is to gain new data on the inhabitants' every-day life, living environment, and the economy of the city at the time when the Greeks built the Doric temples," Zuchtrigel explains to Haaretz, adding, "The quantity and quality of data on the pre-Roman houses, from the same period as the temples, is unexpected."

Please visit the site: <http://www.tornosnews.gr/en/greek-news/culture/24145-2-500-years-old-luxurious-greek-palace-uncovered-by-archaeologists-in-ancient-poseidonia.html>

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## **EGYPTIAN RITUAL IMAGES FROM THE NEOLITHIC PERIOD**

Researchers at the University of Bonn discover spectacular rock art at a burial mound near Aswan

Egyptologists at the University of Bonn discovered rock art from the 4th millennium BC during an excavation at a necropolis near Aswan in Egypt. The paintings were engraved into the rock in the form of small dots and depict hunting scenes like those found in shamanic depictions. They may represent a link between the Neolithic period and Ancient Egyptian culture. The discovery earned the scientists the award for one of the current ten most important archeological discoveries in Egypt from the Minister of Antiquities in Cairo.

For more than 100 years, Qubbet el-Hawa (English: hill of wind) has been a magnet for archeology. Over 80 burial mounds have been uncovered on the hill near Aswan in Egypt during countless excavations. The history of this necropolis for the provincial capital Elephantine extends from around 2200 to the 4th century BC. It was an important trading base for Egyptians in Nubia, and their nobles were buried in the burial mounds. Prof. Elmar Edel from the University of Bonn investigated and documented the necropolis from 1959 to 1984. "The majority of the objects in the Egyptian Museum in Bonn come from these field campaigns," reports Prof. Ludwig Morenz, who heads Egyptology at the Bonn alma mater.

A completely new aspect at Qubbet el-Hawa has now been uncovered during an excavation begun at the necropolis in 2015. The team led by Prof. Morenz with Amr El Hawary, Andreas Dorn, Tobias Gutmann, Sarah Konert and David Sabel discovered much older Neolithic rock art from the 4th millennium BC. "Style and iconography provide solid clues when dating these," says the scientist. "It opens up a new archeological dimension". Some of these engravings on the rock wall are clearly Egyptian in terms of iconography and stylistics, while others are clearly pre-Egyptian as regards the presentation method and motif.

The images were pecked into the rock with a hard point and are now barely perceivable due to their considerable age. Only the archeologically precise recording of the traces and the drawing of the outlines revealed the images with noteworthy iconography. The initially confusing-looking arrangement of dots allows three figures to be seen upon closer inspection: a hunter with bow, a dancing man with raised arms and, between them, an African ostrich.

"The archer clearly shows hunting for the large flightless bird, while the man with raised arms can be identified as a hunt dancer," reports Prof. Morenz. The dancer apparently wears a bird mask. The scene is reminiscent of the conceptual world of hunting, masks and shamanism, as known from many parts of the Earth - including of ostrich hunting by what are known as San (bushmen).

Such hunting and dancing scenes are new in Egyptology

"This social practice and the associated complex of ideas have barely been looked at in Egyptology," says Prof. Morenz. Small painted female figures with dancing, raised arms and a bird mask also come from the 4th millennium BC, and some clay masks were discovered a few years ago in the Upper Egyptian Hierakonpolis. These finds show astounding consistency with the rock paintings of Qubbet el-Hawa.

They may represent a link between the ancient Near Eastern and even southern European Neolithic period and Ancient Egyptian culture. "This opens up new horizons for research," says Prof. Morenz. However, the finds need to be investigated more closely. The much older rock art clearly has nothing to do with the necropolis directly and is probably linked to a prehistoric network of trails that also needs to be researched more intensively.

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Award from the Egyptian Minister of Antiquities

Despite the comparably short excavation time, the discovery by the team of scientists at the University of Bonn has already earned an award: to mark Egyptology day in Cairo, the Egyptian Minister of Antiquities Prof. Khaled El-Enany recently honored this mission with the award for one of the current ten most important archeological discoveries in Egypt.

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Please visit the site: [https://www.eurekalert.org/pub\\_releases/2017-03/uob-eri032217.php](https://www.eurekalert.org/pub_releases/2017-03/uob-eri032217.php) [Go there for pict]

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## **TOMB OF JESUS REOPENS TO PUBLIC** **AFTER \$3 MILLION RESTORATION,** **BY RUSSELL GOLDMAN**

Thousands of Christian pilgrims and members of the clergy gathered at a modest shrine in Jerusalem's Old City on Wednesday to celebrate the completion of a monthslong effort, hundreds of years in the making: the restoration and repair of Jesus' tomb.

The shrine, known as the edicule and in danger of collapse, had been propped up by an unsightly iron cage since the 19th century. Constructed by the Roman emperor Constantine I in the fourth century, the shrine covers the cave in which, the faithful believe, Jesus was buried before his resurrection.

The edifice, contained in the Church of the Holy Sepulcher, is one of the faith's holiest sites. It was worn down by centuries of water damage, fire, candle smoke, humidity, bird droppings, human visitors and disputes among feuding denominations, which were previously unable to agree on plans to fix the shrine.

"For the first time in over two centuries, this sacred edicule has been restored," the Greek Orthodox patriarch, Theophilos III of Jerusalem, said Wednesday, when the shrine reopened to the public. "This is not only a gift to our holy land, but to the whole world."

The Greek Orthodox, Armenian Orthodox and Roman Catholic denominations share custody of the church. The tomb was last restored in 1810 after a fire, but the religious custodians were compelled last year to make repairs after the Israeli authorities deemed the building unsafe.

The restoration cost more than \$3 million, financed mostly by a donation from the World Monuments Fund, an American nonprofit group. Other funding came from the three denominations and a personal donation from King Abdullah II of Jordan.

The work, which began last May, was directed by Antonia Moropoulou, a professor at the National Technical University of Athens. The restorers removed the exterior stones from three sides of the edicule and created a special grout to "bond the masonry to the rock that lies at the core of the structure," according to the World Monuments Fund.

In October, the restoration team revealed and removed a stone slab covering a marble bench on which Jesus was buried, according to tradition. The team also created an opening in a wall in the tomb, through which visitors can peer at the underlying rock.

Please visit the site: <https://www.nytimes.com/2017/03/22/world/middleeast/tomb-of-jesus-reopens-jerusalem.html> [An alarming take is at <http://news.nationalgeographic.com/2017/03/jesus-christ-tomb-jerusalem-restored-collapse-tunnels/>] [Go to both for pix]

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## **ANCIENT ROMAN TEMPLE THE SIZE OF ST PAUL'S CATHEDRAL DISCOVERED IN ITALY - ARCHAEOLOGISTS USED A RADAR DEVICE ATTACHED TO THE BACK OF A QUAD BIKE TO EXAMINE THE EXCAVATION SITE, BY FIONA KEATING**

The remains of a huge Roman temple, the size of St Paul's Cathedral in London has been found by a Cambridge University archaeological team in central Italy. The sacred site was uncovered several feet below Falerii Novi, an abandoned town around 30 miles north of Rome.

The Falerii temple had rows of columns on three sides and is believed to cover a site 120m long and 60m wide. Theories on its use have given insight into a period of Roman expansion and urbanisation in Italy.

The site in southern Etruria, housed around 2,500 people in the time of the Roman Republic, during the 4th and 3rd centuries BC.

The intriguing remains excavated so far are the remains of a theatre, a basilica (used for meetings and legal proceedings) and a large defensive gate, according to a Times report. This latest research adds to historians' understanding of urban planning in the early days of the Roman period.

Archaeologists used a radar device attached to the back of a quad bike to examine the excavation site. Martin Millett, professor of classical archaeology at Cambridge said this device enabled the team to discover in depth the layout of the town as well as its development and growth.

Falerii is believed to have been founded after a rebellion by the Falisci tribe in 241BC was suppressed. The town also gives insight into the Rome's growing cultural exchange from other cultures, as Greek-style buildings were discovered here.

The Roman colony of Falerii Novi was excavated in the 1990s and a geophysical survey shows the existence of warehouses, shops, market places, temples, a theatre and forum.

The British School at Rome has used magnetometry to reveal archaeological features of the city during the times of the Roman Republic. This technique can detect metals at much greater depth than basic metal detectors which have a range of only two metres.

Please visit the site: <http://www.ibtimes.co.uk/ancient-roman-temple-size-st-pauls-cathedral-discovered-italy-1612383>

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## **GREEK MINISTRY OF CULTURE: PORT OF ANCIENT SEA BATTLE OF SALAMIS DISCOVERED**

The Greek Ministry of Culture announced that the location where the Greek naval forces had gathered before the historic sea battle of Salamis against Persians in 480 BC has been discovered

The Greek Ministry of Culture announced that the location where the Greek naval forces had gathered before the historic sea battle of Salamis against Persians in 480 BC has been discovered. The battle of Salamis is one of the most important battles in the history of Ancient Greece. It was a naval battle fought between an alliance of Greek city-states under Themistocles and the Persian Empire under King Xerxes in 480 BC which resulted in a decisive victory for the outnumbered Greeks. The battle was fought in the straits between the Attica mainland and Salamis, an island in the Saronic Gulf near Athens, and is deemed as the climax of the second Persian invasion of Greece. The announcement clarified that the location was most likely the commercial as well as the navy port of the island of Salamis in the classical ancient Greek era, the largest and closest of the Athenian state, after the three ports of Piraeus Kantharos, Zea and Munichia.

The discovery came to light after ongoing archaeological search that started in November-December 2016 by team of 20 experts and scientists from several Greek universities and archaeological bodies and was funded by the British Horon Frost Foundation that supports Maritime Archaeology in the eastern Mediterranean Sea. “It is the commercial and probably war port of the classical and Hellenistic period of the city-state of Salamis”, the Ministry and added: “It is also the region where a portion of the united Greek navy had gathered on the eve of sea battle in 480 BC... It is the pool part of the united Greek fleet on the eve of the great battle of 480 BC, which is adjacent to the most important monuments of the Victory: the Polyandreion (tomb) of Salamis fighter and the Trophy on Kynosoura,” the statement says adding that “references to the ancient port of Salamis has been found in the works of geographers Skylakos (4th BC) and Stravon (1st BC-1st AD) as well as of traveler and geographer Pausanias (2nd AD) The search also verified the existence of ancient artifacts submerged on the three sides (north, west and south) of the bay of Ambelakia. Some of the findings that came to light included port structures, fortifications and various other buildings. “Following aerial photography, photogrammetric processing, topographical and architectural documentation, the first visible map of the region came to surface”, the Minister underlined and also revealed that the investigation confirmed that the three sides of Ambelakia Bay (north, west and south) kept submerged antiquities, which gradually sink and emerge due to changes of the sea level, which, especially in February, reach half a meter.

The findings include harbor structures, fortifications and various premises and are considered of major historical significance for archaeologists and fans of Ancient Greece.

Ancient Greek historian Herodotus recorded that there were 378 triremes in the Allied fleet. The Persian fleet initially numbered 1,207 triremes. However, by his reckoning

they lost approximately a third of these ships in a storm off the coast of Magnesia, 200 more in a storm off the coast of Euboea, and at least 50 ships to Allied action at the Battle of Artemisium.

Please visit the site: <http://www.tornosnews.gr/en/greek-news/culture/23954-greek-ministry-of-culture-port-of-ancient-historical-sea-battle-of-salamis-discovered.html>

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