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# Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

**- Μάρτιος 2021 -**

**Οποιοδήποτε σημείο ενός κύκλου μπορεί να είναι  
αρχή και τέλος.  
(Ηράκλειτος)**

# Newsletter of the Hellenic Society of Archaeometry

**- March 2021 -**

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## **ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS**

# **2<sup>ND</sup> INTERNATIONAL TMM CH CONFERENCE “TRANSDISCIPLINARY MULTISPECTRAL MODELLING AND COOPERATION FOR THE PRESERVATION OF CULTURAL HERITAGE. REBRANDING THE WORLD IN CRISIS THROUGH CULTURE”, EUGENIDES FOUNDATION, ATHENS, GREECE, DECEMBER 12<sup>TH</sup>-15<sup>TH</sup>, 2021, CALL FOR PAPERS**

Dear Colleague,

We are pleased to announce the 2nd International TMM\_CH Conference on “Transdisciplinary Multispectral Modelling and Cooperation for the Preservation of Cultural Heritage. Rebranding the World in Crisis through Culture”, that will be held in Athens, Greece, on December 12th-15th, 2021, following the successful 1st International TMM\_CH Conference in 2018.

You are invited to submit your research contributions for oral and poster presentations. For more information about the Conference: <https://www.tmm-ch.com/>

### **INTERNATIONAL STEERING COMMITTEE**

[https://www.tmm-ch.com/files/TMM\\_CH2021\\_Steering\\_Committee.pdf](https://www.tmm-ch.com/files/TMM_CH2021_Steering_Committee.pdf)

### **INTERNATIONAL SCIENTIFIC COMMITTEE**

[https://www.tmm-ch.com/files/TMM\\_CH2021\\_Scientific\\_Committee.pdf](https://www.tmm-ch.com/files/TMM_CH2021_Scientific_Committee.pdf)

### **ABOUT THE CONFERENCE**

Innovative scientific methodologies and challenging projects marking future trends in the protection of cultural heritage, have initiated a universal conversation within a holistic approach, merging competence from the scientific fields of architecture, civil engineering, surveying engineering, materials science and engineering, information technology and archaeology, as well as heritage professionals on restoration and conservation, stakeholders, industry representatives and policy makers. The combined utilization of digital documentation technologies with innovative analytical and non-destructive techniques, numerical, computational and 3D techniques, archaeometric and archaeogene methods, supports the creation of a transdisciplinary multispectral modeling towards the sustainable preservation of cultural heritage. Innovation is enhancing and revealing a critical dimension of the preservation of cultural heritage along with social participation and communication.

The National Technical University of Athens interdisciplinary team “Protection of monuments” [Prof. A. Moropoulou, Prof. Emer. M. Korres, Prof. A. Georgopoulos, Prof. C. Spyarakos, Ass. Prof. C. Mouzakis], scientific responsible for the Holy Aedicule’s rehabilitation of the Holy Sepulchre in Jerusalem, and the Technical Chamber of Greece, in collaboration with international and Greek Authorities, organize the 2<sup>nd</sup> TMM\_CH International Conference on “Transdisciplinary Multispectral Modelling and Cooperation for the Preservation of Cultural Heritage: Rebranding the World in Crisis through Culture”, on 12-15 December 2021, in Athens, Greece, discussing modern trends in the original agora of our technological and democratic roots.

The Conference is organized by the National Technical University of Athens, in cooperation with the Technical Chamber of Greece, the National Geographic Society, the World Monuments Fund, the Cultural Heritage Finance Alliance, the International Council of Monuments and Sites ICOMOS, the Organization of World Heritage Cities OWHC, the European Society for Engineering Education SEFI, the European Construction Technology Platform ECTP, the International Federation of Surveyors FIG, the International Committee CIPA Heritage Documentation, and other major international and European organizations, associations and networks in the field of cultural heritage preservation, which had successfully organized the 1<sup>st</sup> TMM\_CH Conference.

The conference will be held at the Eugenides Foundation in a hybrid format, if needed.

Scientific walk and talk visits on 12 December 2021 to Acropolis Monuments and Museum [in the footsteps of the Greek Peripatetic Philosophical School] and other visits planned upon demand.

At the 1<sup>st</sup> TMM\_CH Conference, which was held with great success in October 2018 at the Eugenides Foundation in Athens, with the presence of 350 delegates from 22 countries from all continents, the emblematic rehabilitation of the Holy Aedicule of the Holy Sepulchre in Jerusalem was presented as an exemplary application, in the field of monuments protection, of interdisciplinary and multispectral collaboration, as an outcome of innovation, not only on Research, but in the implementation process as well, with emphasis on technological advancements, not only intersecting all the scientific fields of engineers and natural scientists, but also initiating an ongoing dialogue with humanities, such as Archaeology, Theology, Sociology, Diplomacy and Tourism.

The scope of the 2<sup>nd</sup> TMM\_CH Conference is to present the latest developments in research and innovation that identify novel trends to build an interdisciplinary approach to conservation and holistic digital documentation of cultural heritage. The utilization and reuse of monuments, historic cities and sites, forms the framework of a sustainable preservation of cultural heritage, in accordance with the principles of circular economy; in terms of respect and protection of values, materials, structures, architecture and landscape; with an informed society, able to participate effectively in the policies that will design and implement the new strategies required.

Sharing knowledge, experiences, and recommendations about sustainable cultural heritage approaches and practices at a moment of great risk and a time of renewed possibilities, will reorientate conversation to explore the current conditions and contours of the World in crisis rebranding itself through Culture, and relaunching development.

## TOPICS

- Multispectral, Multidimensional, Novel Approach through Transdisciplinarity and Cooperation in the Protection of Cultural Heritage: Exemplary Projects (The Project of the Rehabilitation of the Holy Sepulchre's Holy Aedicule, EDICULA Erasmus+ Strategic Partnership, et als)
- Digital Heritage
- Heritage at Risk
- Resilience to Climate Change, Natural Hazards and Pandemic Risks - Biosafety
- Advanced Non Destructive and Structural Techniques for Diagnosis, Redesign and Health Monitoring
- Archaeometry, Archaeogenetics
- Conserving Compatibility, the Materiality of Structures and Architectural Authenticity
- Cross-Discipline Earthquake Protection and Structural Assessment of Monuments
- Transdisciplinary Dialogue among Architecture, Engineering and Natural Sciences with Humanities and Diplomacy
- Bridging Heritage Stakeholders, Science and Industry
- Sustainable Preservation and Management of Cultural Heritage
- Historical / Architectural Sites, Monuments and Complexes as Open Labs of Innovation and Sustainable Socioeconomic Development
- Historic Cities and Centers: New Preservation Strategies by Reuse for Development
- The Reuse of Cultural Heritage through Circular Economy and Social Participation as Key Contribution to Local and Regional Development
- Cultural Heritage and Tourism
- Revealing and Protection of Cultural and Natural Assets within Green and Blue Deal for Integrated Sustainable Development of Isolated Areas (Islands, Mountain areas, et als)
- Novel Educational Approach for the Preservation of Cultural Heritage
- From Research and Innovation to Policy
- Rebranding the World in Crisis through Culture

## CALL FOR PAPERS

The International Steering Committee and the International Scientific Committee welcome research contributions for oral and poster presentations.

Submitted papers will be peer reviewed. Please check important dates for submission deadlines.

Accepted papers will be distributed into sessions. Plenary lectures [after invitation] will cover major accomplishments, innovations and challenges.

Accepted papers will be published, as in the case of the 1<sup>st</sup> TMM\_CH Conference, in Springer Computer Science Proceedings, available in 2022 following the Conference, and Scientific Journals in the field of Cultural Heritage Preservation, selectively.

Full papers should have an average size of 12 pages and should be written in English. You must submit papers via EasyChair, using the conference link:

<https://easychair.org/conferences/?conf=tmmch2021>

**IMPORTANT DATES**

**Full Paper submission deadline: June 11<sup>th</sup>, 2021**

Notification of author's acceptance with paper corrections: July 21<sup>st</sup>, 2021

Final paper submission: September 11<sup>th</sup>, 2021

Completion of early bird registration: October 1<sup>st</sup>, 2021

Announcement of preliminary program: October 11<sup>th</sup>, 2021

Announcement of the final program: November 1<sup>st</sup>, 2021

Conference dates: December 12<sup>th</sup>-15<sup>th</sup>, 2021

The President of the International Steering Committee of the TMM\_CH Conference

Prof. A. Moropoulou

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**I<sup>ST</sup> INTERNATIONAL CONFERENCE ON  
RELIC STUDIES - RELICS 2021, NOVEMBER  
24-27, 2021, PORTO, PORTUGAL**

Dear Colleagues,

We have the pleasure to announce the call for papers for the *I<sup>st</sup> International Conference on Relic Studies - RelicS 2021* that will take place on November 24-27 2021.

The call for papers is open till **February 28th, 2021**.

The relic, as a physical, rare and valuable remnant of a lost or destroyed religious past, as well as of great spiritual and sensory value, is a vast and complex subject due to the multiplicity of research, conservation and valuation perspectives that it raises. Despite the diversity of studies on relics and their reliquaries, both national and international, the sharing of knowledge on this subject is scarce, focusing mainly on issues of historical and anthropological nature. Thus, RelicS 2021 aims to foster interdisciplinary cross-studies, projects, strategies and artistic practices based on multiple and multidisciplinary approaches.

In 2021 we will have the opportunity to bring together different scientific areas, in order to foster discussion and share knowledge around a non-consensual and sensitive topic.

For further information, please see: [artes.porto.ucp.pt/pt/relicsconference2021?msite=1](https://artes.porto.ucp.pt/pt/relicsconference2021?msite=1)

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**Γ΄ ΔΙΕΘΝΗΣ ΕΠΙΣΤΗΜΟΝΙΚΗ ΣΥΝΑΝΤΗΣΗ**  
**«ΤΟ ΑΡΧΑΙΟΛΟΓΙΚΟ ΕΡΓΟ ΣΤΗΝ**  
**ΠΕΛΟΠΟΝΝΗΣΟ» (ΑΕΠΕΛ3), 2-5 ΙΟΥΝΙΟΥ**  
**2021, ΚΑΛΑΜΑΤΑ, 2<sup>Η</sup> ΕΓΚΥΚΛΙΟΣ**  
**THIRD INTERNATIONAL SCIENTIFIC**  
**MEETING “ARCHAEOLOGICAL WORK IN**  
**THE PELOPONNESE” (AWOP3), JUNE 2-5,**  
**2021, KALAMATA, 2<sup>ND</sup> CIRCULAR**

Αγαπητοί συνάδελφοι,

Η Γ΄ Διεθνής Επιστημονική Συνάντηση «Το Αρχαιολογικό Έργο στην Πελοπόννησο» (ΑΕΠΕΛ3), που διοργανώνει το Τμήμα Ιστορίας, Αρχαιολογίας και Διαχείρισης Πολιτισμικών Αγαθών του Πανεπιστημίου Πελοποννήσου, θα πραγματοποιηθεί διαδικτυακά και, εφόσον οι υγειονομικές συνθήκες το επιτρέψουν, με φυσική παρουσία στις **2-5 Ιουνίου 2021**. Οι εργασίες της Συνάντησης θα πραγματοποιηθούν στο Αμφιθέατρο «Ν. Πολίτης» της Σχολής Ανθρωπιστικών Επιστημών και Πολιτισμικών Σπουδών του Πανεπιστημίου Πελοποννήσου στην Καλαμάτα (Παλιό Στρατόπεδο – Ανατολικό Κέντρο, είσοδος από οδό Σφακιανάκη).

Σκοπός του ΑΕΠΕΛ3 είναι η ενημέρωση σχετικά με την αρχαιολογική έρευνα των τελευταίων ετών στην Πελοπόννησο, τα νησιά του Αργοσαρωνικού, τα Κύθηρα και τα Αντικύθηρα και η παρουσίαση στους ειδικούς επιστήμονες και στο ευρύτερο κοινό των αποτελεσμάτων του ανασκαφικού και ερευνητικού έργου της τελευταίας τριετίας και συγκεκριμένα:

- του πρωτογενούς υλικού, όπως αυτό προκύπτει από πρόσφατες ανασκαφές και έρευνες πεδίου,
- των πορισμάτων από πρόσφατες ή τρέχουσες έρευνες και μελέτες σε παλαιότερο ή νεότερο υλικό,
- των έργων ανάδειξης και διαχείρισης αρχαιολογικών συνόλων και χώρων.

Δεκτές γίνονται, μετά από έγκριση της Επιστημονικής Επιτροπής, πρωτότυπες ανακοινώσεις καθώς και παρουσιάσεις σε μορφή αναρτημένων ανακοινώσεων (poster), οι οποίες θα δημοσιευτούν ως πλήρη άρθρα στην τελική έκδοση των Πρακτικών. Οι ανακοινώσεις θα είναι διάρκειας 15 λεπτών. Επίσημες γλώσσες του ΑΕΠΕΛ3 είναι η ελληνική και η αγγλική.

Ως καταληκτική ημερομηνία αποστολής του δελτίου συμμετοχής και της περίληψης ορίζεται η **28<sup>η</sup> Φεβρουαρίου 2021**. Η Α΄ Εγκύκλιος και το Δελτίο Συμμετοχής είναι διαθέσιμα εδώ: <http://ham.uop.gr/el/drasis/2015-11-13-09-28-51>.

**Οργανωτική Επιτροπή**

Νίκος Ζαχαριάς, Ελένη Ζυμή, Χαρά Θλιβέρη, Μαρία Κουρή, Αιμιλία Μπάνου, Μαρία Ξανθοπούλου, Χρυσάνθη Παπαδοπούλου, Ιωάννα Σπηλιοπούλου

### Επιστημονική Επιτροπή

Ευγενία Γιαννούλη, Νίκος Ζαχαριάς, Ελένη Ζυμή, Παρή Καλαμαρά, Άννα Βασιλική Καραπαναγιώτου, Παναγιώτα Κασίμη, Ερωφίλη-Ιρίς Κόλια, Αναστασία Κουμούση, Μαρία Κουρή, Ευαγγελία Μηλίτση-Κεχαγιά, Αιμιλία Μπάνου, Ανδρέας Ντάρλας, Μαρία Ξανθοπούλου, Ευαγγελία Πάντου, Άλκηστις Παπαδημητρίου, Χρυσάνθη Παπαδοπούλου, Ιωάννα Σπηλιοπούλου

\*\*\*\*\*

Dear colleagues,

The Third International Scientific Meeting of the “Archaeological Work in the Peloponnese” (AWOP3), which is organized by the Department of History, Archaeology, and Cultural Resources Management of the University of the Peloponnese, will take place remotely and, if conditions permit, in person on **2-5 June 2021**. The meeting will be held at the “N. Politis” Amphitheatre of the School of Humanities of the University of the Peloponnese in Kalamata (Palαιο Stratopedo – Anatoliko Kentro, entrance from Sfakianaki Street).

The aim of AWOP3 is to inform specialists and the general public on archaeological work undertaken in the Peloponnese, the islands of the Argo-Saronic Gulf, Kythera, and Antikythera during the last three years, namely:

- finds from recent excavations and other fieldwork,
- the results of recent studies of new or old material,
- work relating to the conservation and management of monuments and archaeological sites.

Presentations must be original. Oral presentations are limited to 15 minutes. Posters are also invited and will be published as full papers in the proceedings of AWOP3. All submissions will be reviewed by the Scientific Committee for approval. The official languages of AWOP3 are Greek and English.

The deadline for the submission of registration forms is **28 February 2021**. The First Circular and Registration Form are available at <http://ham.uop.gr/en/outreach/conferencesd>.

### Organizing Committee

Emilia Banou, Maria Kouri, Chryssanthi Papadopoulou, Ioanna Spiliopoulou, Hara Thliveri, Maria Xanthopoulou, Nikos Zacharias, Eleni Zimi

### Scientific Committee

Emilia Banou, Andreas Darlas, Paraskevi Kalamara, Anna Vasiliki Karapanagiotou, Panagiota Kasimi, Erofilis-Iris Kolia, Anastasia Koumoussi, Maria Kouri, Evangelia Militsi-Kehagia, Evangelia Pantou, Alkistis Papadimitriou, Chryssanthi Papadopoulou, Ioanna Spiliopoulou, Maria Xanthopoulou, Evgenia Yiannouli, Nikos Zacharias, Eleni Zimi

## **8<sup>TH</sup> CONFERENCE IN AEGEAN ARCHAEOLOGY, JUNE 24-25, 2021, UNIVERSITY OF WARSAW, POLAND**

Dear Aegeaneters,

We would like to invite you to participate in the 8<sup>TH</sup> CONFERENCE IN AEGEAN ARCHAEOLOGY, which will take place in a hybrid format at the University of Warsaw (Poland) and online on June 24th and 25th, 2021.

Proposals for conference presentations are especially welcomed from early career researchers, such as PhD students or candidates, and scholars who have already completed their doctoral research and recently obtained their title. Please find more details at

[https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.archeologia.uw.edu.pl%2Fwp-content%2Fuploads%2F2021%2F01%2F8AEG\\_CFP.pdf&data=04%7C01%7Caeeanet%40lists.ku.edu%7C20f8cd2b93a24ad1e16308d8c7c3f8f3%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C637478991811582609%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6IklhaWwiLCJXVCI6Mn0%3D%7C3000&data=A3LyRN01Cu4HsIRKnYsYdbOQhCm9suPkbGVH0L2srPY%3D&reserved=0](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.archeologia.uw.edu.pl%2Fwp-content%2Fuploads%2F2021%2F01%2F8AEG_CFP.pdf&data=04%7C01%7Caeeanet%40lists.ku.edu%7C20f8cd2b93a24ad1e16308d8c7c3f8f3%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C637478991811582609%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6IklhaWwiLCJXVCI6Mn0%3D%7C3000&data=A3LyRN01Cu4HsIRKnYsYdbOQhCm9suPkbGVH0L2srPY%3D&reserved=0).

For further detailed and practical information, as well as updates, you can also visit the conference's webpage on Facebook

<https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.facebook.com%2Fevents%2F240224277622765&data=04%7C01%7Caeeanet%40lists.ku.edu%7C20f8cd2b93a24ad1e16308d8c7c3f8f3%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C637478991811582609%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6IklhaWwiLCJXVCI6Mn0%3D%7C3000&data=S2whaNOLhliBBuyWYc81Z%2F9MfsmjV4yCycLLv8icaoU%3D&reserved=0>).

If you would like to participate, please submit a title and abstract of c. 250 words in English (using the APPLICATION FORM:

[https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.archeologia.uw.edu.pl%2Fwp-content%2Fuploads%2F2021%2F01%2F8AEG\\_Application-Form.doc&data=04%7C01%7Caeeanet%40lists.ku.edu%7C20f8cd2b93a24ad1e16308d8c7c3f8f3%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C637478991811582609%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6IklhaWwiLCJXVCI6Mn0%3D%7C3000&data=%2BPokS6N800WoTzv1v%2F8x6j6glEbvXsWE04%2FCWrfgYPY%3D&reserved=0](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.archeologia.uw.edu.pl%2Fwp-content%2Fuploads%2F2021%2F01%2F8AEG_Application-Form.doc&data=04%7C01%7Caeeanet%40lists.ku.edu%7C20f8cd2b93a24ad1e16308d8c7c3f8f3%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C637478991811582609%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6IklhaWwiLCJXVCI6Mn0%3D%7C3000&data=%2BPokS6N800WoTzv1v%2F8x6j6glEbvXsWE04%2FCWrfgYPY%3D&reserved=0)

before March 15th, 2021 to [egea@uw.edu.pl](mailto:egea@uw.edu.pl).

We plan to publish the proceedings of this conference in the next volume of “Symposium Egejskie. Papers in Aegean Archaeology” – a peer-reviewed series edited by the

organisers of the conference and published by the University of Warsaw Press publishing house.

Should you have any questions regarding the conference, please feel free to contact us at any time at [egea@uw.edu.pl](mailto:egea@uw.edu.pl). We have contingency plans in place to hold the entire conference online if this proves necessary and we will contact participants before the end of May to confirm the final details regarding the format. Due to the unusual circumstances, there will be no conference fee this year.

We are looking forward to seeing you in Warsaw or online!

The organisers

Stephanie Aulsebrook  
Katarzyna Żebrowska  
Agata Ulanowska  
Kazimierz Lewartowski

The Department of Aegean and Textile Archaeology The Faculty of Archaeology  
University of Warsaw, Poland

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## **IRUG14 CONFERENCE, THE CULTURAL HERITAGE AGENCY OF THE NETHERLANDS (RCE), 2-4 JUNE, 2021**

Dear IRUG Colleague,

We hope that this message finds you and your loved ones well during these challenging times.

As the host of the IRUG14 Conference, the Cultural Heritage Agency of the Netherlands (RCE) is pleased to announce that IRUG14 will be held as a virtual event this year. In consultation with the IRUG Board of Directors, we have chosen this format in place of our traditional in-person meeting.

The IRUG14 conference will run from Wednesday, June 2 to Friday, June 4, 2021, and feature shorter, half-day sessions starting from 14.00 and ending at 18.30 CET/CEST (8:00 am - 12:30 pm ET). Speaker presentations will address diverse aspects of infrared and Raman spectroscopy for the study, documentation, and protection of the world's cultural heritage.

Registration for this virtual event will be free of charge. We will be sending you further information about the program and online registration procedures in the coming weeks, this information will also be published on the IRUG website ([www.irug.org](http://www.irug.org)). In the meanwhile, please address inquiries to Suzan de Groot, <https://www.cultureelerfgoed.nl/actueel/agenda/2020/05/27/irug-conference>.

While we will miss seeing everyone gathered in-person, we are excited to connect with our many colleagues around the world for an enjoyable and informative event.

On behalf of the Cultural Heritage Agency of the Netherlands, IRUG Board and IRUG14 Organizing Committee, we send our best wishes and look forward to your participation.

Susan Lammers  
Director Cultural Heritage Agency of the Netherlands (RCE)

Suzan de Groot  
Senior Conservation Scientist  
Heritage Laboratory of the Netherlands (RCE)

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# **3<sup>RD</sup> INTERNATIONAL RADIOCARBON IN THE ENVIRONMENT CONFERENCE (RIE III- 2020), JULY 5<sup>TH</sup>-9<sup>TH</sup>, 2021, SILESIAN UNIVERSITY OF TECHNOLOGY, GLIWICE, POLAND, SECOND CIRCULAR**

This is the second circular to announce the **3rd International Radiocarbon in the Environment Conference (RIE III-2020)** to take place on **July 5th to 9th, 2021**, at the **Silesian University of Technology, Gliwice (Poland)**.

Details about Conference, as well as registration form can be found at the website:  
<https://c14env.polsl.pl/>

Organising committee e-mail: [c14env@polsl.pl](mailto:c14env@polsl.pl)

Find us on Facebook: <https://fb.com/c14env/>

## **Topics**

The scientific scope of the conference follows most of the well-received features of the previous Radiocarbon in the Environment Conference:

Radiocarbon in:

- the atmosphere (carbon dioxide, methane and other gases, aerosols)
- terrestrial environment (tree rings, macrofossils, sediments, animals, etc.)
- freshwater and marine environment (including groundwater and karstic systems)
- past and recent climate studies (regional and global changes)
- anthropogenic (fossil and nuclear) pollutions
- bio-components.

Sessions for related studies, such as development in sample preparation and measurement technique, statistical tools for data processing etc. are also foreseen.

Additionally, separate session on stable isotopes will be organized by Jacek Pawlyta ([Jacek.Pawlyta@polsl.pl](mailto:Jacek.Pawlyta@polsl.pl)).

<b>Important dates</b>	Date
<b>Call for abstract</b>	OPEN
<b>Abstract deadline</b>	March 31, 2021
<b>Decision about form of Conference (online/hybrid)</b>	March 31, 2021
<b>Notification of Abstract Acceptance</b>	April 30, 2021
<b>Regular fee deadline</b>	April 30, 2021
<b>Deadline for refund</b>	May 01, 2021
<b>Conference date</b>	July 05-09, 2021

## **Abstract submission**

For abstract submission, please register at the website <https://c14env.polsl.pl/> first. Abstract submission form is available for registered participants.

### Venue\*

The conference will be held in the city of Gliwice, in southern Poland. Gliwice is one of the oldest and most beautiful cities in the Upper Silesia. Gliwice is also an important academic, scientific and industrial centre. More information about the city can be found on the website <https://gliwice.eu/en>.

Our conference will be held in the *Education and Congress Centre* located on the campus of the Silesian University of Technology. Gala Dinner will also take place on campus\*.

### Accommodation\*

Accommodation is not included in the conference fee. Delegates are responsible for finding and booking their own accommodation. There is no specific conference hotel, but we have some recommendations listed below:

- Qubus Hotel Gliwice (<https://www.qubushotel.com/en>)
- Hotel Silvia (<http://hotelsilvia.pl/en/>)
- Hotel Royal (<https://www.hotelroyal.com.pl/en/hotel-2/>)
- Hotel Diament Plaza Gliwice (<https://www.hotelediament.pl/en/hotels/hotel-diament-plaza-gliwice/>)
- Hotel Diament Economy (<https://www.hotelediament.pl/en/hotels/hotel-diament-economy-gliwice/>).

The choice of hotels is much greater. For example hotels can be booked through the websites like [booking.com](https://www.booking.com), [momondo.com](https://www.momondo.com) or [airbnb.com](https://www.airbnb.com).

### Registration payment

Registration Fees	regular (02.2021 - 04.2021)	late from 05.2021
Full delegate fee	460 EUR	500 EUR
Student delegate fee	270 EUR	300 EUR
Accompanying person fee1*	250 EUR	250 EUR

1- includes ice breaker reception, conference tour and lunches (only if possible on-site conference)

Participants, who are interested in **Gala Dinner**, may participate in it for an additional fee **50 EUR\***.

Registration fee includes:

1. Conference registration, abstract volume
2. Ice breaker (accompanying person also)\*
3. Lunches (accompanying person also)\*
4. Coffee breaks\*
5. Publication
6. Congress bag and materials\*
7. Conference tour (accompanying person also)\*

Cancellation policy:



75% refund before 01.04.2021  
50% refund before 01.05.2021  
No refund after 01.05.2021

The payment of the conference fee should be done via bank transfer:

Account information for payments in EUR:

PL68 1050 1230 1000 0023 6055 5748 (ING BANK ŚLĄSKI S.A. O/GLIWICE)

SWIFT CODE: INGBPLPW

Remark: C14env and the name of the participant.

Please ensure that the bank charges are borne by the participant, and make sure that the remark C14env and your name appear on the payment form. Regrettably, we cannot accept credit cards or payment by cash.

**We look forward to welcoming you in Gliwice, Poland!**

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\*Only if the Conference will be organized on-site in Gliwice.

\*\*Information about the General Data Protection Regulation due to EU law can be found on the conference website.

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**ASOR ANNUAL MEETING (IN PERSON), THE  
SECRET LIVES OF OBJECTS:  
CONSERVATION SCIENCE, TECHNOLOGY,  
AND DIGITAL HUMANITIES, CHICAGO, IL,  
NOVEMBER 17–20, 2021, CALL FOR PAPERS**

Chairs:

Lisette Jimenez, San Francisco State University [lmj@sfsu.edu](mailto:lmj@sfsu.edu) Kiersten Neumann,  
University of Chicago [neumann@uchicago.edu](mailto:neumann@uchicago.edu)

SESSION DESCRIPTION

Objects have unique histories, beginning with where they were made, followed by how they may have been used, discarded, discovered, bought and sold, stored, and displayed. The lives and stories of objects persist as archaeologists, art historians, and museum professionals continue to appropriate, objectify, and re-contextualize them in an attempt to uncover the histories and sometimes hidden truths surrounding these artifacts. Researching and contextualizing objects can shed light on issues of provenance and provenience; raise discussions of repatriation; and potentially redefine the histories of disciplines. The focus of this session will be on the importance of context and object histories and how current object-based research encourages a dialogue of challenging ethical issues.

Year one (2019) of this multi-year session highlighted the importance of object research and context. Contributions focused on collections research, archival research and redefining disciplinary histories, and repatriation efforts. Year two (2020) explored how different types of object narratives and counter histories are established by cultural institutions, exhibitions, research, education, and publications, and how the reception and meaning of objects can change as a result of mode of presentation, perspective, and voice. This year (2021) will explore the application of conservation science, technology, and digital humanities projects to the study of objects and collections.

Contributions to this session will discuss the benefits of interdisciplinary and collaborative object-based research with respect to these avenues of practice and suggest future possibilities for object and collections studies.

This ASOR Member-organized Session is posted online at <https://www.asor.org/am/2021/approved-sessions-chicago-2021#secret>

The call for papers is now open. Deadline for submission is March 15, 2020. If you are interested in participating, please submit your abstract directly to ASOR's Online Abstract Management System:

<https://www.asor.org/am/2021/call-for-papers-2021> and select "The Secret Lives of Objects" under "Categories" for the session in which you would like to present your paper.

Please note that in order to present a paper at the Annual Meeting, you must be a current member of ASOR (<http://www.asor.org/membership/>) and register for the Annual

Meeting when submitting your abstract (<https://www.asor.org/am/2021/annual-meeting-registration-2021>).

If you have any questions about the session, please do not hesitate to contact us directly.

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## **4<sup>RD</sup> INTERNATIONAL CYCLADOLOGICAL CONFERENCE, 22-25 SEPTEMBER, 2021, TENOS, FIRST CIRCULAR**

The Society for Cycladic Studies is a non-profit organisation established in 1958; its main work is the publication of its annual journal, “Epeteris” for Cycladic Studies, with themes and issues related to the islands of the Cyclades; twenty-one volumes of the “Epeteris” have been published from 1961 till today.

After the successful organization of three International Cycladological Conferences, the First in 1991 on Andros, the Second in 1995 on Thera, and the Third on Syros, in 2016, the proceedings of which have been published in volumes of the “Epeteris”, the Society decided to prepare the organization of the **Fourth International Cycladological Conference on Tenos, from the 22th September 2021 to the 25 of September 2021.**

Title: The Cyclades: Cultural Heritage - Sustainability.

The proposed thematic conference sections are as follows:

- Environment, Natural and Anthropogenic (geology, geoarchaeology, flora, fauna, palaeoethnobotany, physical anthropology, nutrition, health etc.).
- Archaeology: new investigations in the Cyclades, Conservation, restoration, heritage management of ancient sites, monuments and museums
- Architecture, Land development, and traditional settlements
- History and Demographics, Society, Law: individual and collective behaviour
- Philosophy, Literature, Intellectual Life, and the Arts
- Economy, Sustainable Development, Aephoria: Resources and Commercial networks
- Social Anthropology, Folk Culture,
- special studies on Tinos

The Society for Cycladic Studies, addressing the international scientific community, invites both Greek and foreign scholars to participate.

The conference is intended to address both specialists and the wider public.

Where one author proposes several papers, the Scientific Committee will decide on a selection of papers and posters to be presented in the Conference.

Official languages of the conference will be Greek and English.

Oral announcements should last no more than 15 minutes and may be accompanied by PowerPoint presentations. Poster presentations will be additionally accepted, with specific guidelines, which will be announced in the next circular.

Papers and posters must be original and they should not have been presented in other venues or published in other journals in the same specific form.

Those wishing to participate as delegates with oral announcements or poster presentations should send the completed Participation Form with the suggested title of their paper, their name and surname, their title and affiliation, and a summary of their paper (up to 300 words) by **March 31, 2021** either via email in:

[info.ekyklamel@gmail.com](mailto:info.ekyklamel@gmail.com) or,

via post to the following address : Pheron Str. 7, 10434 Athens, Greece

All the submitted papers will be peer-reviewed by a body of independent referees and by the Organizing and Scientific Committees.

After an initial evaluation of submissions, the Organizing Committee will announce, via a new circular, the final number of participants and other details about the conference. The proceedings will be published in the following “Epeteris” volume.

The deadline for the submission of final papers for publication is the **31<sup>th</sup> March 2021**.

Athens, August 2020

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## **CALL FOR PAPERS – ISOTOPIC INVESTIGATIONS IN ANE & CAUCASUS (ASOR 2021), NOVEMBER 17-20, CHICAGO, USA**

American Schools of Oriental Research (ASOR) 2021 Annual Meeting will be held November 17-20 in Chicago in-person, and will include a second, virtual, component to be held online December 9-12. As per ASOR protocol, you may choose to present your paper (1) only in Chicago, (2) only in the virtual session or (3) in Chicago and in the virtual session (same paper).

At this time, we are inviting contributions to the virtual Isotopic Investigations in the Ancient Near East and Caucasus Session. As a ‘Standing ASOR Session’, the conference organization committee allows us to hold an in-person session in Chicago, as well as the virtual session. If you are planning to attend the Chicago meeting and would like to present in-person, as well as virtually, please contact the session chairs directly to let us know, so we can plan ahead realistically for an inclusive and productive gathering for our research community.

Isotopic Investigations in the Ancient Near East and Caucasus  
<https://www.asor.org/am/2021/approved-sessions-chicago-2021#isotopic>

Session Chairs: G. Bike Yazıcıoğlu-Santamaria, Simon Fraser University and Maureen E. Marshall, University of Illinois at Urbana-Champaign

Description: The objective of this session is to encourage a dialogue among researchers conducting biogeochemical analyses in the region, integrating analytical methods with social and historical questions in ancient communities of the ancient Near East and Caucasus across the periods. Complementary to the session, current developments are discussed each year at the “Archaeological Isotopes Working Group” Business Meeting.

The deadline for submission of abstracts (max. 250 words) is March 15, 2021. Instructions for submissions via ASOR’s Online Abstract Management System can be seen at: <https://www.asor.org/am/2021/call-for-papers-2021>

Please contact Bike Yazıcıoğlu ([bike\\_yazicioglu@sfu.ca](mailto:bike_yazicioglu@sfu.ca)) with any questions.

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**ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ –**  
**JOB VACANCIES/FELLOWSHIPS**

**VACANCY AT UPPSALA UNIVERSITY,**  
**RESEARCHER POSITION IN ACCELERATOR**  
**MASS SPECTROMETRY (AMS)**

Please visit this link for details: <https://www.uu.se/en/about-uu/join-us/details/?positionId=380884>

For further information about the position please contact: Daniel Primetzhofer Senior lecturer/Associate Professor at Department of Physics and Astronomy, *Applied Nuclear Physics*. Phone: 018-471 3040, [daniel.primetzhofer@physics.uu.se](mailto:daniel.primetzhofer@physics.uu.se).

Please submit your application by 15th March 2021

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## **ANDREW W. MELLON POSTDOCTORAL FELLOWSHIP IN SCIENTIFIC RESEARCH AT PHILADELPHIA MUSEUM OF ART**

### **We Are Committed to an Inclusive Workplace**

At the Philadelphia Museum of Art, we actively seek to employ a diverse group of people who embody our organizational values. We welcome and encourage individuals of all backgrounds to apply, especially those from traditionally underrepresented groups in the museum field, who are inspired by our shared purpose and enjoy working collaboratively with others.

We are an equal opportunity employer. All qualified applicants will receive consideration for employment without regard to age, ancestry, citizenship or immigration status, color, disability, ethnicity, familial status, gender identity and/or expression, genetic information, marital status, national origin, race, religion, sex, sexual orientation, veteran status, or any other protected status.

### **How You Will Contribute**

The Philadelphia Museum of Art (PMA) invites applications for a two-year Andrew W. Mellon Foundation Postdoctoral Fellowship in Scientific Research, which begins September 2021 and ends August 2023. The fellowship will provide the opportunity to gain working knowledge of and proficiency in the scientific research and instrumental analysis of cultural heritage materials within a museum setting. During the first year, the Fellow will be introduced to the workings of the PMA, including those of the curatorial and conservation divisions. The Fellow will be incorporated into the daily activities of the Department and will receive instruction on the proper usage of core analytical instruments (FTIR, Py-GCMS, Raman, SEM-EDS/WDS, and XRF). In the second year, the Fellow will develop original research focused on the PMA's collections culminating in work of publishable quality.

The Fellow will receive a competitive starting salary and is eligible for full museum benefits, including medical, dental, and vision as well as paid time off. This position also includes a travel stipend for research and/or conferences.

### **Your background and experience include:**

- PhD in the physical sciences granted within the last five years; course work in material science or polymer chemistry helpful
- Excellent written and oral communication skills
- Proven ability to plan and execute original research
- Additional education or background in studio art, art history or conservation desirable
- Acute attention to detail and ability to work collaboratively and flexibly
- Strong interest in pursuing a scientific career in a museum setting

### **Application Procedures**



*The deadline to submit applications is March 15, 2021.*

Please include the following with your application:

- Cover letter with statement of interest
- Curriculum vitae including publication record
- Official undergraduate transcripts
- Two confidential letters of recommendation from professionals familiar with candidate's work and one personal reference mailed directly to:

Dr. Kate Duffy, Conservation Division  
Philadelphia Museum of Art  
PO Box 7646  
Philadelphia, PA 19101-7646  
([kate.duffy@philamuseum.org](mailto:kate.duffy@philamuseum.org))

### **Compensation**

The starting salary for this position is \$47,000 commensurate with experience plus \$5,000 per year for research and travel. Compensation for this position will be discussed during the interview stage of the hiring process. If you have specific questions regarding compensation prior to submitting your application, please email [hr@philamuseum.org](mailto:hr@philamuseum.org).

**To Apply:** [philamuseum.applytojob.com/apply/QC72FBCtvu/...](https://philamuseum.applytojob.com/apply/QC72FBCtvu/...)

\*\*\*\*\*

Emma Perloff  
Conservation Administrator  
Philadelphia Museum of Art  
Philadelphia PA

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## **PHD OPPORTUNITY NORTHUMBRIA UNIVERSITY & TATE**

**PhD Opportunity:** Removal of synthetic varnishes from sensitive modern paints with innovative surface-attached gels. UKRI/AHRC funded. [Northumbria University](#) and [Tate](#).

**Competition Funded PhD Project** (Students Worldwide)

**Salary:** The studentship will provide payment of tuition fees, a maintenance stipend at standard UKRI rates (£15,609 p.a. for 2021/2), a £600 stipend payment and an additional £1,000 travel and research bursary provided by Tate.

**Eligibility requirement:**

- Academic excellence of the proposed student i.e. 2:1 (or equivalent GPA from non-UK universities [preference for 1st class honours]); or a Masters (preference for Merit or above)
- Appropriate IELTS score, if required.
- Applicants cannot apply for this funding if currently engaged in Doctoral study at Northumbria or elsewhere.

For further details of how to apply, entry requirements and the application form, see [here](#)

**Deadline for applications:** 14 May 2021

**Start Date:** 1 October 2021

**APPLY**

\*\*\*\*\*

Charis Theodorakopoulos  
Senior Lecturer  
Northumbria University Newcastle Program in Preventive Conservation/Conservation of Fine Art  
Newcastle upon Tyne  
+44 191 227 4611

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## **SCHOLARSHIPS FOR MA AND POST- DOCTORAL RESEARCH: ARCHAEOMAGNETISM OF ANCIENT NEAR EASTERN MATERIAL CULTURE**

Scholarships for MA and post-doctoral research: Archaeomagnetism of ancient Near Eastern material culture

**(deadline: March 23, 2021, or until positions are filled)**

Archaeomagnetic research on Bronze and Iron Age materials has become a flourishing field with proven contributions to both archaeology (chronology and site formation processes) and geophysics (the study of the Earth's magnetic field and related phenomenon).

As part of a BSF-supported multi-faceted archaeomagnetic research on baked clays from the ancient Near East, we are looking for potential candidates for research on the MA and/or post-doctoral level. The collaborative work includes Tel Aviv University (hosting institute), Scripps Institution of Oceanography at UC San Diego (Paleomagnetic Laboratory), Digital Past Lab at Ariel University (Mesopotamian History and Digital Humanities), and Institute of Archaeology at UCL (Mesopotamian history/archaeology). It requires living in Israel and extended travels to the US for sample collection and extensive lab work.

Preference will be given to candidates whose background is in geophysics and/or Mesopotamian archaeology and ancient Near Eastern studies. Deadline for application (via email) is March 23, 2021, or until positions are filled. Scholarships rate are according to TAU's guidelines, 100% for 2-years MA, and 150% for 1-year postdoctoral fellow (100% for an Israeli citizen).

Starting date is October 1st 2021 (an earlier date is optional).

On the potential of the research field, see, for example, here:

<https://www.academia.edu/36904064/>

### **Technical information:**

Eligible to apply (postdoc): A candidate must have received their doctoral degree within five years prior to the start of the fellowship (October 2021); candidates who have yet to submit their dissertation by the date of the deadline, shall submit all the documents March 23rd, 2021. Winners of the fellowship must produce a certificate of eligibility for PhD degree or a written proof of submission of the PhD thesis for review, no later than September 1st, 2021; candidates who will fail to submit such a document by September 1st, will not be able to begin their fellowship.

Not eligible to apply (postdoc): Tel Aviv University PhD graduates (unless they completed a postdoctoral fellowship elsewhere).

Eligible to apply (MA): A candidate must have a BA/BSc in archaeology/archaeological sciences. In all other cases, a year of complementary course work is required (not funded).

\*\*\*\*\*

Erez Ben-Yosef ([ebenyose@tauex.tau.ac.il](mailto:ebenyose@tauex.tau.ac.il)), Mark Altaweel ([m.altaweel@ucl.ac.uk](mailto:m.altaweel@ucl.ac.uk)), and Shai Gordin ([shaigo@ariel.ac.il](mailto:shaigo@ariel.ac.il))

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## ***INTERNET SITES***

### **ΑΡΧΑΙΑ ΕΛΛΗΝΙΚΗ ΤΕΧΝΟΛΟΓΙΑ: ΑΠΟ ΤΟΝ ΘΕΟ ΣΤΟΝ ΑΝΘΡΩΠΟ**

Ένα πολύ ενδιαφέρον ντοκιμαντέρ της Cosmote TV για την αρχαία ελληνική τεχνολογία και την εξέλιξή της από τον ομηρικό μύθο στην κλασική και ελληνιστική πραγμάτωση. Μια παραγωγή του καθηγητή Θεοδόση Τάσιου στην οποία συμμετέχει και η αξιόλογη συνάδελφος κι αγαπημένη φίλη Τάνια Βασιλειάδου, Επίκουρη Καθηγήτρια του τμήματος Μηχανικών Βιομηχανικής Σχεδίασης και Παραγωγής του πανεπιστημίου μας.

<https://www.youtube.com/watch?v=rktzFnmvZt8&list=PLnxyoMVDsfQaXXGXO6JjUubwy5YOPLQOo>

Καλή ψυχαγωγία!

Σταύρος Φατούρος

Τμήμα Μηχανικών Πληροφορικής και Υπολογιστών  
Πανεπιστήμιο Δυτικής Αττικής

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## 5 ΕΤΗ ΕΡΕΥΝΑΣ ΣΤΟ ΚΑΣΤΡΟΥΛΙ

Αγαπητοί μου,

Κλείνοντας 5-έτη έρευνας στο Υστερομυκηναϊκό Καστρούλι, Δεσφίνα-Δελφοί, Νοτίας Φωκίδας, παρουσιάζουμε το πρόγραμμα μας στην ιστοσελίδα:  
[www.kastrouli.org](http://www.kastrouli.org).

Το διεπιστημονικό έργο συνεχίζει με διεθνείς και ελληνικές συνεργασίες και με την συμμετοχή του Μυκηναϊκού Ιδρύματος.

Καθ. Ιωάννης Λυριντζής

\*\*\*\*\*

*Ioannis Liritzis Ph.D (Edin.)*

*European Academy of Sciences & Arts (Salzburg) - Dean of Class IV Natural Sciences (2021)*

*Distinguished Professor, Henan University, China*

*Honorary Fellow, University of Edinburgh, Scotland*

*Honorary Professor, Rhodes University, South Africa*

*Honorary Professor Samara State Institute of Culture, Russia*

*Scientific Partner, Center for Cyberarchaeology University of California, San Diego, USA*

*Membre Correspondant, Académie des Sciences, Arts et Belles-Lettres, Dijon*

Professor of Archaeometry-Natural Sciences

*University of the Aegean*

*Dept. of Mediterranean Studies*

*- Director Laboratory of Archaeometry (Founder)*

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## ***ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS***

# **THE ROLE OF ZOOARCHAEOLOGY IN THE STUDY OF THE WESTERN ROMAN EMPIRE**

Martyn Allen, JRA supplementary series, 107. Portsmouth: Journal of Roman Archaeology, 2019. Pp. 168. ISBN 9780999458617 \$87.00.

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As evinced by its numerous publications, the field of animal studies is growing apace in the study of Greek and Roman antiquity. In general the source material of these studies tends to fall into two distinct groups. The first tends to rely mainly on texts and iconographic sources such as vase or wall paintings and stelai. Some of these studies focus on a particular animal or group of animals and others on the social implications of human-animal interaction. The second group comes out of the rising field of zooarchaeology, where the faunal remains of a site or area are given the attention which excavators prior to the 1970s routinely denied them. As Maltby (p. 16) points out, however, cooperation and synthesis among experts such as zoologists, botanists, numismatists, epigraphers, et al., is far too rare. Rarer still is a work incorporating a full integration of the evidence to be gleaned from the labors of such experts and that resulting from the work of those traditionally called philologists.

One hopes that this is the future of the field of animal studies. To give a concrete example, would not commentaries on texts as diverse as the *Moretum*, Apicius, or the feast of Trimalchio benefit from knowledge of faunal assemblages contemporary with the authors in question? And would not those who study faunal remains not benefit from seeing their finds against the evidence to be found in ancient literary texts? This volume is representative of a first step in this direction.

The first two essays by Allen and Maltby, respectively, do an excellent job of laying out the current state of the extent to which zooarchaeology has helped improve our knowledge of various aspects of Romano-British studies. Maltby, in particular, emphasizes that zooarchaeology has moved from simply being dry lists reported in an appendix to a field which is fully integrated into archeological reports.

King demonstrates the impressive cultural information that can be teased out of a careful examination of faunal remains to give us a better sense of which animals (e.g. cattle, sheep, pig) were more preferred in an area. Coupled with information such as climate and topography, this helps us better understand variations between areas.

Roman Britain thus can become less a homogeneous province and more an aggregate of distinct parts possessing differing customs. Deschler-Erb and Groot take this one step

further, using faunal remains from Switzerland and the Netherlands to investigate how armies were supplied their meat (by local trade vs. home grown for example), and to what extent the location of an army installation factored into these pragmatic issues. MacKinnon uses pork vs. beef consumption to investigate the degree to which certain areas became Romanized. Local suppliers, after all, had to adapt to the preferences of their new neighbors.

Mazzorin and Minniti study a subject inherently of interest to the average classicist, namely the zooarchaeological evidence for animal trade based on the evidence from the Roman Colosseum. Not only is the subject matter common fodder for Latin and Roman Civilization courses at any level, but these authors are at pains to cite many literary sources alongside the osteological evidence, teaching us, for example, that the first reference to an ostrich in the arena is in Plautus (Persa 198-99). The number of animals mentioned and the find sites of their bones make fascinating reading. One does miss any reference to Donald Kyle's theories that dead animals from the arena were distributed to plebeian Romans.[1]

Miller et al. demonstrate the precision of zooarchaeology in their study of how and when the fallow deer was imported into England, how it might be imported whole or in butchered parts, and the use of these parts in things like magic and medicine. Hesse offers an example of what zooarchaeology can offer when excavation is meticulous and limited to a small area. Such detailed work, revealing things as small as egg shell fragments, can provide evidence of sacrifices carried out in a Roman household. Corbino et al. study the assemblage of thousands of animal bones from an Etruscan well that was in use for centuries, leading to an inquiry of whether Mithraism was practiced there. The last essay of the group studies bones and remains from several sites to indicate a shift in the purposes of feasts as Britain transitioned from Roman times to the Iron Age, an excellent example of how the field has moved from mere lists and numbers to integrating the zooarchaeological finds into a broader picture of a culture and area.

The book is rather technical in parts and, with notable exceptions, does not integrate archaeological data with evidence from ancient texts. It often seems to have a target audience of other zooarchaeologists. For example, many are heavily data driven. One contribution is just over twelve pages in length and about 5.5 pages of this consists of charts and tables. The non-specialist will encounter abbreviations such as NISP, and LSI long before a contributor mercifully defines them for the layperson. Other terms are familiar to specialists such as anatomists (“unfused epiphyses”; “distal metapodial”) or data analysts (\*= $p < 0.05$ ; Mann-Whitney U test).

Such specificity, coupled with the book's hefty price, will probably confine it to the bookshelves of research libraries and specialists.

Others can profit from studying individual chapters. We have mentioned the contributions of Mazzorin and Minniti above. A scholar of Caesar, Tacitus, or the Roman army, for example, could find the piece by Deschler-Erb and Groot of use, even though the texts of Caesar and Tacitus are not cited in the article.

Thus the book is exactly what it purports to be, a focused study of different approaches and subjects that provides a “snapshot in time” that helps zooarchaeology “step out of its own shadow” and contribute to the wider field of Roman archaeology (p. 9). It is a



notable step forward in producing such a fusion and, one hopes, a prelude to the time when the works of philologists and zooarchaeologists are routinely and equally citing each other and writing in a style that is accessible by either discipline.

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[1] Kyle, Donald G. “Animal Spectacles in Ancient Rome: Meat and Meaning.” Nikephoros , vol. 7, 1994, pp. 181-205.

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Please visit the site: <https://bmc.brynmawr.edu/2021/2021.02.06/>

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## **IN SEARCH OF THE INVISIBLE HEARTH: AN EXPERIMENTAL PERSPECTIVE ON EARLY LEVANTINE IRON PRODUCTION**

Vanessa Workman, Aren M.Maeir, Eliyahu-Behar

### **Abstract**

Conclusive evidence has surfaced for the production of iron objects in urban workshops in the Southern Levant during the early Iron Age.

While nearly a dozen sites with metallurgical debris and technical ceramics dating to the 10th–8th c. BCE have contributed to the visibility of the craft, in situ high-temperature installations remain enigmatic in the archaeological record. Our ability to reconstruct the chaîne opératoire of iron production processes within each working context is restricted by the lack of this critical data. In this study we employ methods of experimental archaeology in order to investigate and interpret an assemblage of vitrified technical ceramics found in an early Iron Age metal workshop at the site of Tell es-Safi/Gath situated on the border between the southern coastal plain and the Judean foothills of Israel.

As part of a broader research framework, iron smelting experiments were carried out in a simple, clay-built bowl furnace. Materials analogous to the archaeological ceramics were employed to address high temperature alterations occurring in a single installation. Using structural mineralogical and chemical analyses (FTIR, pXRF and SEM-EDS) we characterize the experimental and archaeological technical ceramics to identify the processes that affect and transform these materials during iron production activities. Results were then utilized to interpret production processes and the implementation of technical ceramics in ironworking at Tell es-Safi/Gath. Based on our observations, we address the specialized preparation of technical ceramics in early ironworking, possible reasons for the alteration and preservation of metallurgical installations following their abandonment and attempt to improve the interpretation and classification of vitrified ceramic waste from ancient metallurgical contexts.

**Please visit the site:**

<https://www.sciencedirect.com/science/article/abs/pii/S2352409X21000158?via%3Dihub>

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Regards,

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## **EΙΔΗΣΕΙΣ - NEWS RELEASE**

# **WHO BUILT THE EGYPTIAN PYRAMIDS? NOT SLAVES BY ERIC BETZ**

Pyramid workers were paid locals. Yet historical narratives and Hollywood films have made many believe the Jews built the pyramids while enslaved in Egypt.

There's no end to conspiracy theories about who built the pyramids. Frequently they involve ancient aliens, lizard people, the Freemasons, or an advanced civilization that used forgotten technology. Scientists have tried and failed to combat these baseless ideas. But there is another misconception about pyramid construction that's plagued Egyptian scholars for centuries: Slaves did not build the pyramids.

The best evidence suggests that pyramid workers were locals who were paid for their services and ate extremely well. We know this because archaeologists have found their tombs and other signs of the lives they lived.

### **The Lives of Pyramid Workers**

In 1990, a number of humble gravesites for pyramid workers were found a surprisingly short distance from the tombs of the pharaohs. Inside, archaeologists discovered all the necessary goods that pyramid workers would need to navigate passage to the afterlife — basic kindnesses unlikely to have been afforded common slaves.

But that's not all. Archaeologists have also spent years excavating a sprawling complex thought to have been a part-time home for thousands of workers. The site is called Heit el-Ghurab, and it was also likely part of a larger port city along the Nile River where food and supplies for the pyramid workers, as well as pyramid construction materials, were imported from across the region. Inside the rubble of Heit el-Ghurab, they found evidence for large barracks where as many as 1,600 or more workers could have slept together. And archaeologists also uncovered extensive remains from the many meals they ate, including abundant bread and huge quantities of meat, like cattle, goat, sheep and fish.

These workers' graffiti can also be found all over the buildings they created. The marks, written in Egyptian, were hidden on blocks inside the pyramids and were never meant to be seen. They record the names of various work gangs, including "the Drunkards of Menkaure" and "the Followers of the Powerful White Crown of Khufu." (Both gangs were named after the respective pharaohs of their day.) Other marks signify towns and regions in Egypt. A few seem to function as mascots that represent a division of workers, and they feature images of animals such as ibises.

Together, these hieroglyphics give archaeologists hints about where the workers came from, what their lives were like, and who they worked for. Nowhere have archaeologists found signs of slavery or foreign workers. Meanwhile, there is ample evidence of labor tax collection throughout ancient Egypt. That's led some researchers to suggest workers

might have rotated through tours of construction, like a form of national service. However, it's also unclear if that means the workers were coerced.

### **Hollywood Myths of Egypt**

So why do so many people think the Egyptian pyramids were built by slaves? The Greek historian Herodotus seems to have been the first to suggest that was the case. Herodotus has sometimes been called the “father of history.” Other times he's been dubbed the “father of lies.” He claimed to have toured Egypt and wrote that the pyramids were built by slaves. But Herodotus actually lived thousands of years after the fact.

Another obvious origin of the slave idea comes from the longstanding Judeo-Christian narrative that the Jews were enslaved in Egypt, as conveyed by the story of Moses in the book of Exodus.

Hollywood took the idea and ran with it. Cecil B. DeMille's *The Ten Commandments* films — originally released in 1923 and then reshot in 1956 — depicted a tale of the Israelites enslaved and forced to construct great buildings for the pharaohs. And as recently as 2014, the Ridley Scott movie *Exodus: Gods and Kings* depicted Christian Bale as Moses freeing the Jews from slavery as they built the pyramids.

Egypt banned the film, citing “historical inaccuracies,” and its people have repeatedly spoken out against Hollywood movies that repeat Biblical narratives about Jewish people building Egyptian cities. Even the 1998 Dreamworks animated film, *The Prince of Egypt*, earned significant criticism for its depictions of Moses and Jewish slaves forced into construction projects.

In fact, archaeologists have never found evidence for the Biblical tales that the Israeli people were imprisoned in Egypt. And even if the Jewish people were imprisoned in Egypt, it's extremely unlikely that they would have built the pyramids. The last pyramid, the so-called Pyramid of Ahmose, was built roughly 3,500 years ago. That's hundreds of years before historians think the Israeli people first appeared. It's also centuries before the oldest known Egyptian reference to the Jews on the Victory Stele of Merneptah.

So, while archaeologists still have much to learn about the people who built the pyramids and how the work was organized and executed, it is easy to throw out this basic misconception. The pyramids were built by Egyptians.

**Please visit the site: <https://www.discovermagazine.com/planet-earth/who-built-the-egyptian-pyramids-not-slaves>**

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## **SCIENTIFIC INVESTIGATIONS OF BELIEVED REMAINS OF TWO APOSTLES**

In Rome lies the Santi Apostoli church, cared for by Franciscan brothers for more than 500 years. For more than 1500 years, this site has held the believed remains of two of the earliest Christians and Jesu apostles: St. Philip and St. James the Younger - relics of the Holy Catholic Church.

In the first few centuries of Christianity, life was difficult for the Christian minority, but gradually towards the sixth century Christianity became the dominant religion and after Emperor Constantine on his deathbed declared Christianity the state religion, churches were erected all over the Roman Empire.

Shortly after the churches were erected, remains of worshipped Christian martyrs were moved from their graves to designated worship churches in the towns. This also applied for the remains of the two apostles, St. Philip and St. James. Such movements of remains were called translations.

### **A foot, a femur and a tibia**

It is unknown who translated the believed remains of St. Philip and St. James and where from, but it is a fact that they came to glorify the current church of Santi Apostoli in Rome, constructed in their honor. It is also a fact that the remains have been kept in the church since the sixth century.

So, are the relics really the remains of St. James and St. Philip? And what else can we learn from the bones?

The skeletons are today far from complete. Only fragments of a tibia, a femur and a mummified foot remain. The tibia and foot are attributed to St. Philip, the femur to St. James. It appears likely that this has been the case since the sixth century.

### **Radiocarbon dating**

Professor of chemistry and archaeometry, Kaare Lund Rasmussen from University of Southern Denmark has led the scientific investigations of these remains supported by a team consisting of colleagues from University of Groningen in Holland, University of Pisa in Italy, Cranfield Forensic Institute in England, Pontifical Institute of Christian Archaeology in Italy and the National Museum of Denmark.

The results are published in the scientific journal Heritage Science.

The researchers considered the remains of St. Philip too difficult to de-contaminate and radiocarbon date, and their age thus remains unknown so far. But the femur, believed to belong to St. James, underwent several analyses. Most importantly, it was radiocarbon dated to AD 214-340.

Thus, the preserved relic, the femur, is not that of St. James. It originates from an individual some 160-240 years younger than St.

James, explains Professor Kaare Lund Rasmussen, University of Southern Denmark, adding:

- Though the relic is not that of St James, it casts a rare flicker of light on a very early and largely unaccounted for time in the history of early Christianity.

Who that person was, is of course impossible to say.

### **Searching for martyr corpses**

- We consider it very likely that whoever moved this femur to the Santi Apostoli church, believed it belonged to St. James. They must have taken it from a Christian grave, so it belonged to one of the early Christians, apostle or not, comments Professor Kaare Lund Rasmussen.

The same goes for the believed remains of St. Philip, he adds.

- One can imagine that when the early church authorities were searching for the corpse of the apostle, who had lived hundreds of years earlier, they would look in ancient Christian burial grounds where bodies of holy men might have been put to rest at some earlier time, the researchers write in Heritage Science.

### **Moving bones - a popular tradition:**

The first known movement of a martyr's remains to a church is that of St Babylas in AD 354. His remains were transferred from a cemetery in Antioch to Daphne and placed in a church especially built for the purpose by Governor Caesar Gallus Immediately after this, translations got popular: the translations of St Timotheus, St Andrew, and St Lukas to Constantinople followed in a year's time At the same time, sources reflect an increasing popularity and circulation of relics from the second part of the 4th century onwards Despite the criticism of bishop Athanasius of Alexandria († 373) and Shenoute († 465) at the end of the same century and in the following, relics of martyrs and saints began to be moved into the churches Throughout the Roman empire, bodies or body parts were exhumated, transferred, and reburied in the apse in close vicinity of the altar of many important churches.

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Read the research paper 'Investigations of the relics and altar materials relating to the apostles St James and St Philip at the Basilica dei Santi XII Apostoli in Rome'

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**Please visit the site: [https://www.eurekalert.org/pub\\_releases/2021-02/uosd-sio020121.php](https://www.eurekalert.org/pub_releases/2021-02/uosd-sio020121.php) [Go there for pix]**



## **ARCHAEOLOGISTS DISCOVER FRIENDS OF CAESARS INSIDE VATICAN CITY, BY PHILIPPE BOHSTRÖM**

So far, 250 magnificent burials of the Roman elite have been unearthed inside the walls of the Vatican City.

New burials discovered inside the Roman necropolis of Santa Rosa, standing under what is now Vatican City, have shed light on burials that housed the servants and slaves of the Roman Caesars.

So far, 250 magnificent burials of the Roman elite, servants and freed slaves from the Julio-Claudian era to the times of Emperor Constantin have been unearthed inside the walls of the Vatican City, revealing the life of the rich and poor in Rome.

The Roman necropolis stood on the current hill of the Vatican along the ancient Via Triumphalis. Until now, only a small area of about 1,000 square meters has been investigated by archaeologists.

The numerous tombs with human remains date from the 1st to the beginning of the 4th century CE, and include a bewildering array of built chamber-tombs, gravestones, funerary portraits and beautiful sculptured sarcophagi bearing the names of the entombed, as well as ground-level libation pipes but also poorer open-air (but underground) deposition with grave objects still present on the tomb, thus allowing the archaeologist to study Roman burial customs from the 1st to the 3rd century CE.

### **Cremation burials**

The ongoing excavations have provided intriguing and unexpected insights into Roman life – such as the mobility of people from the lower classes to the higher social strata, but also changes in burial practices and the transformation of beliefs.

”The burials not only shed light on the transition of burial practices, such as the passage from cremation to the less expensive practice of inhumation: The funerary rites also express the hopes and superstition of the deceased at a time when the Romans stopped believing in the Olympian gods, so they were left uncertain [how to] trust their expectation of an afterlife [relative] to new philosophies or old superstitions,” according to Giandomenico Spinola, director of the department of Greek and Roman art in the Vatican Museum.

The tombs of the servants and slaves of the Caesars In Roman times, cemeteries and tombs were lined along the roads that lead to urban centers, so that the mere entering of a city would bring the visitor into contact with the world of death. The funerary monuments commemorated the lives of the Roman elite, who built lavish monuments to ensure their lasting legacy.



However, the newly excavated burials along the Via Triumphalis have provided intriguing and unexpected insights into the life of those who were outside this Roman elite.

In fact, in ancient Rome, the prospect for economic movement existed, and when people of the lower classes such as former slaves became wealthy, they sought to memorialize their success by building a tomb or grave marker that served as a visual reminder of their rise to the nouveau riche.

Two examples of surviving funerary monuments from the necropolis of Santa Rosa illustrate some of these tendencies while providing a window into Roman funerary culture and art associated with freedmen, that is, people who were former slaves.

In the eastern part of the cemetery, many of the monumental tombs that have been excavated have engraved inscriptions providing valuable details into the life of the deceased.

In this burial area, the archaeologists also discovered two lavish funeral altars that date to the time of Emperor Nero (54-68 CE).

The first altar was dedicated to Flora by her parents Tiberius Claudius Optatus and Passiena Prima. Later on, an inscription was added with the name of their son, Tiberius Claudius Proculus as well as of Lucius Passienus Evaristus, who was the freed slave and Passiena Prima's brother.

What is of great interest is the specification of Optatus' job in the inscription. He had served as Nero's archivist, a position of trust and delicacy.

The second altar is dedicated to the memory of Passiena Prima, showing a portrait of her with a hairstyle typical of the Julia-Claudian era, which is identical with the hair style of Agrippina the younger, Nero's mother.

“We seem to have here a group of freedmen all connected, either directly or indirectly, to the familia Caesaris,” says Dr. Leonardo Di Blasi who is co-director of the necropolis of Santa Rosa.

While the freed slave Tiberius Claudius was not a member of Rome's elite or patrician class, he certainly wanted to convey his importance and close proximity to the imperial family by erecting these two altars, showing his family's status.

Funeral altars, dating to the time of Emperor Nero, which were dedicated to Flora and Passiena Prima by the freedman Tiberius Claudius Optatus.

Next to the family tomb of Tiberius Claudius, the archaeologists discovered a beautiful funerary building dedicated to the slave Alcimus, whom Emperor Nero had commissioned to carry out maintenance work inside one of Rome's most important theaters, Teatro Pompeiano, also known as the theater of Pompeus since it was built by Pompeus the Great in 55 BCE.

Nearby was found a marble funerary shrine with the portrait of young child, Tiberius Natronius Venustus, who was four years, four months and ten days old when he died.

Another magnificent burial, dating from the mid-3rd century CE, has been found on the hillside, in the northeastern corner of the Vatican and above an earlier tomb dating back to the 1st century CE.

The entrance of the tomb leads to an 1,800-year-old chamber room, with two arched recesses at the back of the chamber, which was used as a place of entombment. Here the archaeologists found five sarcophagi placed on an elaborate decorated mosaic floor, with a braided pattern depicting cupids harvesting grapes from vines, and a Dionysius leaning on a young satyr.

”From the end of the second century, families belonging to the new social class built their own sepulchres above the ancient burials, displaying their social status through the rich marble sarcophagi that replaced the practice of cremation,” explains Di Blasi.

Buried inside one of the sarcophaguses was Publius Caesilius Victorinus, a Roman equestrian (equivalent to the social class of a knight) who died at the age of 17. The lid of the sarcophagus depicts several dolphins swimming among the sea waves.

“Dolphins, known as friends of sailors, were considered a good omen by seamen; there are many legends about dolphins that lead sailors to safer shores,” explains Di Blasi.

In the classical world, dolphins often give lifts to both mortals and gods, and were considered Poseidon's special messengers. In the funerary context, therefore, the dolphins accompany the souls to the underworld.

“Victorinus was buried at a time when Christianity was spreading in the Roman Empire. Interestingly, the iconography of the sarcophagi displays both pagan and Christian elements. For instance, the figures of the dolphins are symbolically transformed into Christ, who leads the dead to the "safest shores" of the sky.

Another clue to the Christian faith of the deceased is a female figure with her arms raised in prayer, which in Roman art symbolizes virtue or pietas, a religious devotion for one's family and homeland.

However, in Christian iconography, the image symbolizes the committing of the soul to Christ in prayer.

The Mausoleum-like building that contained the five sarcophagi bears close resemblance with the so-called “tombs of the Egyptians” that was found in the necropolis under St. Peter's Basilica. It is called the Egyptian tomb because of the picture of Horus, which is painted in the center of the north wall of the tomb.

Alongside these monumental graves, the archaeologists have found hundreds of burials of ordinary roman citizens.

“The necropolis of Santa Rosa is one of the best-preserved burial sites of the Roman world and contains a treasure trove of the life of the ancient Romans. In this graveyard we have found the burials of ordinary men such as postmen, bakers, blacksmiths,

fountain makers, ambassadors and members of a team of the charioteers that competed in the circus,” Di Blasi concluded.

“The site will continue to provide valuable insight into Roman society.”

Since February 1, 2021, the necropolis inside the Vatican has been open to the public.

**Please visit the site: <https://www.ipost.com/archaeology/archaeologists-discover-friends-of-caesars-inside-vatican-city-657802> [Go there for pix]**

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## **ARCHAEOLOGISTS FIND A MUMMY WITH A GOLDEN TONGUE, BY JACEY FORTIN**

The tongue, found at a temple on the outskirts of Alexandria, Egypt, was probably meant to help the deceased speak in the afterlife, experts said.

A golden tongue would not have been uncommon in elite burials during Egypt's Ptolemaic and Roman periods. Credit...Egyptian Ministry of Tourism and Antiquities

Archaeologists working at a temple on the outskirts of the Egyptian city of Alexandria have found 16 human burial chambers there, the government's ministry of tourism and antiquities announced on Friday.

At least one contained a human skull with a golden tongue nestled in its jawbone.

The tongue was made of gold foil, according to a statement from the ministry, which added that it was meant to ensure that the deceased person would be able to "speak in the afterlife."

It was discovered at the temple of Taposiris Magna, which is on the southwestern outskirts of Alexandria, on Egypt's Mediterranean coast.

Archaeologists found other golden artifacts, too, including a funeral mask with golden flakes arranged in the shape of a wreath and some gilded decorations depicting Osiris, the ancient Egyptian god of the dead.

During the time of the pharaohs, gold was often used to decorate the funereal masks of rulers like King Tutankhamen. It had also been molded to encase the fingers and toes of the dead.

Golden tongues, too, have been found in Egyptian remains before, said Jennifer Houser Wegner, a curator of Egyptian artifacts at the Penn Museum in Philadelphia, where several of these tongues are housed.

"For the Egyptians, gold was a material that had qualities of everlastingness," Dr. Wegner said. "It never tarnished. It always shone brilliantly."

According to the Egyptian ministry of tourism and antiquities, the tongue found at Taposiris Magna was meant to help the deceased converse with Osiris on their way to the afterlife.

The mummies found there were not particularly well preserved. They date to a period more than 2,000 years ago, when Egypt was ruled by Greek Macedonians, and later Romans. The temple itself, according to the ministry, appears to have been built during the reign of King Ptolemy IV, a Macedonian king who ruled in the third century B.C.

Queen Cleopatra VII, who reigned for about two decades before her death in 30 B.C., was the last ruler of the Ptolemaic Dynasty before the Romans took over, and coins depicting her face have also been found in the temple.

A golden tongue would not have been uncommon in elite burials during the Ptolemaic and Roman periods, said Lorelei H. Corcoran, the director of the Institute of Egyptian Art and Archaeology at the University of Memphis.

“Within an Egyptian funerary context, its reference is to Spell 158 of the Book of the Dead, which ensures that the deceased has the ability to breathe and speak, as well as to eat and drink, in the afterlife,” Dr. Corcoran added. “It may be conflated with the Greek funerary practice of placing a coin on or in the mouth of the deceased as payment for the ferryman, Charon, who transported the deceased across the River Styx to the Underworld.”

The team of archaeologists that found the 16 tombs at Taposiris Magna was led by Kathleen Martinez, a lawyer-turned-amateur-archaeologist from the Dominican Republic. The team has been working for years to find Cleopatra’s tomb, and had focused their efforts on Taposiris Magna.

But the burial site of the famous queen, who reigned from Alexandria and was said to have died there, has not turned up there yet.

“The stated goal of the Egyptian-Dominican mission is to find the burial of Cleopatra at Taposiris Magna,” Dr. Corcoran said. “Many scholars believe, however, that the burial place of Cleopatra was within a royal burial complex, perhaps associated with the palace district, now lost underwater in the Alexandria harbor.”

Representatives of the Egyptian tourism ministry did not immediately respond to a request for more information about the 16 burial tombs at Taposiris Magna. The Egyptian newspaper Al-Masry Al-Youm reported that two golden tongues were found there and would be studied at the Alexandria National Museum before being put on display in museums across Egypt.

The latest discovery comes as Egypt is making a concerted effort to draw visitors to the country, which depends heavily on tourism. In recent years, archaeologists have unearthed more than 100 delicately painted wooden coffins at the ancient burial ground of Saqqara, a 4,400-year-old tomb with rare wall paintings near Cairo, and remnants of a colossal Pharaonic statue in the working-class neighborhood of Matariya.

**Please visit the site: <https://www.nytimes.com/2021/02/03/science/egypt-mummy-golden-tongue.html> [Go there for pix]**

## **OLDEST EVIDENCE TO DATE OF THE PRODUCTION OF OLIVES FOR EATING – 6,600 YEARS AGO – FOUND AT SITE THAT NOW LIES UNDER THE SEA OFF HAIFA’S SOUTHERN BEACHES**

The earliest evidence found to date concerning the production of olives for eating, dating back some 6,600 years, has been found at the submerged chalcolithic site Hishulei Carmel, off the coast at Haifa.

The discovery is described in a new study published in the prestigious journal *Scientific Reports* by researchers from the University of Haifa, the Technion, Tel Aviv University, the Hebrew University, the Volcani Institute, and other research institutions in Israel and abroad. This discovery predates by around 4,000 years the oldest evidence of the production of olives for eating uncovered until now.

“This latest discovery completes the chain of use of olive trees, beginning with use of the wood for burning, through the production of oil some 7,000 years ago, and on to our finding, where the fruit was used for consumption,” explains Dr. Ehud Galili of the Zinman Institute of Archeology at the University of Haifa, who led the research.

Olives are a key component of the human diet, culinary culture, and economy of the Mediterranean region. Archeological findings and written testimony shows that olive oil was used extensively for consumption, lighting, worship, hygiene, and cosmetic purposes in ancient times. However, the date when olives began to be eaten has remained a mystery. “Historical documents attribute the first consumption of eating olives in Europe to the middle of the first millennium BCE, and in Egypt to the classical period following the conquest of Alexander the Great, so that all the evidence until now centered on the middle of the first millennium BCE,” notes Dr. Liora Kolska Horwitz of the Hebrew University.

The current study was undertaken at the Hishulei Carmel site (named after a nearby factory), which is situated approximately 500 meters south of the southernmost beaches of Haifa. The site dates back to the Middle Chalcolithic period, some 6,600 years ago. Remnants from this period are now found from the shoreline and to a distance of 120 meters, and at a depth of up to four meters under the sea. It is believed that in this period the sea level was around three to four meters lower than today, and the coast was some 200-300 meters west of its current location, so that the site was situated on the coast in its day. No remains of residential homes have been found at the site, but the excavations have uncovered round utensils with a diameter of 1.5 meters, made from collected stones. According to the researchers, these utensils were used as wells or storage pits. During the underwater surveys, the researchers found two oval stone structures containing thousands of saturated olive pits, most of them complete and excellently preserved. In order to identify the use made of the olives, research was undertaken by a multidisciplinary team of archeologists and botanists from 11 research institutions in Israel and abroad.

“As soon as we found the olive pits, we could see that they were different to those used to produce olive oil. In debris from oil production, the pits are mostly crushed, whereas most of the ones found were whole,” explains Dr. Dafna Langgut of Tel Aviv University. The researchers compared the findings to pits and utensils found by Dr. Galil several years ago at another underwater site – Kfar Samir, off the coast by Dado Beach. Kfar Samir is an older site, dating back 7,000 – 7,500 years, and situated some 1,800 meters from Hishulei Carmel. The utensils found at Kfar Samir contained crushed olive pits, as well as olive peel, and were identified as debris from the production of olive oil. As noted, the pits found at the Hishulei Carmel site were mostly whole, and no peel or other evidence was found suggesting the production of oil. Moreover, in the remnants of the pits at Kfar Samir the researchers found grains of olive pollen, which is also found today in debris at olive presses. This pollen was not found in the utensils uncovered at the Hishulei Carmel site.

Another factor supporting the assertion that the utensils were intended for the production of olives for eating is the proximity of the site to the sea. As noted, at the time the site was on the coastline. A coastal location does not permit the storage of olives, due to high humidity which leads to the rapid development of mold.

Accordingly, the researchers believe, it is not logical to suggest that the facilities were used for the storage of fresh olives.

Conversely, the coastal location could have provided access to vital ingredients used in the pickling of olives, such as seawater and sea salt. As part of their study, the researchers undertook a controlled examination in a food laboratory at the Technion and managed to cure olives using seawater. “The pickling of olives in the utensils discovered could have taken place after the fruit was washed repeatedly in seawater in order to reduce the bitterness, and then soaked in seawater, possibly with the addition of sea salt,” suggests Prof. Ayala Fishman of the Technion. “The lack of olive pollen grains in the utensils, which are usually found in olive debris, supports the hypothesis that the olives were washed repeatedly, as is customary to this day when pickling olives,” adds Prof. Mina Weinstein-Evron of the University of Haifa. Wild olives from Mt. Carmel, and possibly olives grown in ancient groves, probably provided the raw material for the production of olive oil and olives for eating,” comment botanists Dr. Simcha Lev-Yadon, Dr. Oz Barazani, and Dr. Arnon Dag.

“We did not find any residential buildings at the Hishulei Carmel site or at Kfar Samir, but we found pits, round utensils, stone grinding basins, sieves made of twigs – and now the olive production facilities. These sites may have served as ancient “industrial zones” for the settlements along the Carmel Coast in the Chalcolithic period, beginning to produce olive oil around 7,000 years ago and olives for eating 6,600 years ago,” concludes Dr. Galili.

**Please visit the site: <https://www.haifa.ac.il/2021/02/02/ancient-olives/?lang=en> [Go there for pix]**



## **PREHISTORIC BONE ETCHINGS BELIEVED TO BE AMONG OLDEST EVIDENCE OF HUMAN USE OF SYMBOLS**

While scientists and historians have long surmised that etchings on stones and bones have been used as a form of symbolism dating back as early as the Middle Paleolithic period (250,000-45,000 BCE), findings to support that theory are extremely rare.

A recent discovery by archeologists from the Hebrew University and the University of Haifa alongside a team from the Le Centre National de la Recherche Scientifique in France have uncovered evidence of what may be the earliest-known use of symbols. The symbols were found on a bone fragment in the Ramle region in central Israel and are believed to be approximately 120,000 years old.

Remarkably the fragment remained largely intact and the researchers were able to detect six similar etchings on one side of the bone, leading them to believe that they were in the possession of something which held symbolic or spiritual significance. The find, which was recently published in the scientific journal *Quaternary International*, was discovered in a trove of flint tools and animal bones exposed at a site during archaeological excavations.

Dr. Yossi Zaidner of the Institute of Archeology at Hebrew University says that the site was likely used as a camp or a meeting place for Paleolithic hunters who would then slaughter the animals they caught at that location. The identified bone is believed to have come from an extinct large wild cattle, a species which was very common in the Middle East at that time.

Using three-dimensional imaging, microscopic methods of analysis and experimental reproduction of engravings in the laboratory, the team was able to identify six different engravings ranging from 38 to 42 millimeters in length. Dr. Iris Groman-Yaroslavski from the University of Haifa explained, "Based on our laboratory analysis and discovery of microscopic elements, we were able to surmise that people in prehistoric times used a sharp tool fashioned from flint rock to make the engravings."

The paper's authors stress that their analysis makes it very clear that the engravings were definitely intentionally man made and could not have been the result of animal butchering activities or natural processes over the millennia. They pointed to the fact that the grooves of the engravings discovered are in a clear U-shape and wide and deep enough that they could not have been made by anything other than humans intent on carving lines into the bone.

The analysis was also able to determine that the work was performed by a right-handed craftsman in a single working session.

Ms. Marion Prévost from the Institute of Archeology at Hebrew University says that every indication was that there was a definite message behind what was carved into the



bone. "We reject any assumption that these grooves were some sort of inadvertent doodling.

That type of artwork wouldn't have seen this level of attention to detail."

So what was the message behind the six lines in the bone? The authors write, "This engraving is very likely an example of symbolic activity and is the oldest known example of this form of messaging that was used in the Levant. We hypothesize that the choice of this particular bone was related to the status of that animal in that hunting community and is indicative of the spiritual connection that the hunters had with the animals they killed."

Dr. Zaidner said, "It is fair to say that we have discovered one of the oldest symbolic engravings ever found on earth- and certainly the oldest in the Levant. This discovery has very important implications for understanding how symbolic expression developed in humans. At the same time, while it is still not possible to determine the exact meaning of these symbols we hope that continued research will unveil those key details."

Please visit the site: <https://phys.org/news/2021-02-prehistoric-bone-etchings-believed-oldest.html> [Go there for pix] [Full study at <https://www.sciencedirect.com/science/article/abs/pii/S1040618221000021>]

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## **RUINS OF ANCIENT PTOLEMAIC TEMPLE DISCOVERED IN EGYPT**

Archaeologists in Egypt have unearthed the remains of a Ptolemaic period temple, a Roman fort and an early Coptic church, according to the Egyptian Ministry of Tourism and Antiquities.

The church was built in the ruins of the Roman fort, which was found at an archaeological site known as Shiha Fort in the Aswan governorate in southern Egypt, the ministry announced in a January 18 statement.

The temple dates to the Ptolemaic dynasty, which began about two decades after Alexander the Great died in 323 B.C.

After Alexander's death, General Ptolemy I became ruler of Egypt (323–285 BC) and founder of the Ptolemaic dynasty, which reigned longer than any other dynasty established until the Alexandrian empire succumbed to the Romans in 30BC.

The crumbling temple, also found at the site, was decorated with an unfinished sandstone panel that showcased a Roman emperor, according to the Egyptian Ministry of Tourism and Antiquities.

Although the temple's panel is incomplete, archaeologists could see that it depicted the entrance of a temple. In the engraved scene, a man who looks like a Roman emperor, stands next to an altar featuring an unknown deity on top of it, archaeologists said.

The temple had four sandstone blocks decorated with palm frond carvings, according to Mostafa Waziri, secretary-general of the antiquities ministry.

In the temple, archaeologists also found an inscription written in a hieratic script, the local cursive writing system used in Ancient Egypt.

The writing was about a Greek emperor. There were also carvings showing cartouches (Egyptian hieroglyphs carved into a vertical oval engraving) of the Ptolemaic kings. A clay vase and part of a red brick vault dating back to the Coptic era were also found.

Archaeologists have known about this site in Aswan for some time.

Between 1920 to 1922, German archaeologist Hermann Junker uncovered a part of it, according to Mohamed Abdel Badie, head of the Central Administration Antiquities of Upper Egypt. However, the excavation was never finished.

Please visit the site: <https://greekcitytimes.com/2021/02/03/ancient-ptolemaic-temple-egypt/> [Go there for pix]

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## **2,000-YEAR-OLD TERRACOTTA FIGURINES OF DEITIES, MORTALS, ANIMALS FOUND IN TURKEY, BY LIVIA GERSHON**

Some of the petite sculptures still bear traces of the pigments used to decorate them

Turkish archaeologists studying the ruins of the ancient town of Myra have found more than 50 terracotta figurines depicting humans, gods and animals.

The team, working on behalf of Akdeniz University and Turkey's Ministry of Culture and Tourism, excavated the town's 12,000 seat Roman-era theater and an older, smaller theater located below it this past summer. They found the figurines in the older structure, which dates to the Hellenistic period (spanning Alexander the Great's death in 323 B.C to the rise of the Roman Empire around 31 B.C.).

Dig leader Nevzat Çevik, an archaeologist at Akdeniz, tells Live Science's Yasemin Saplakoglu that the art's discovery was "an unexpected big surprise."

He adds, "It is as if the people of ancient Myra were resurrected and ran through the time tunnel all together and came to our day."

The statuettes, each standing just a few inches tall, include rams, horsemen, women with children and a boy carrying fruit, as well as mythic figures like Leto, Artemis, Apollo and Heracles.

Çevik tells the Demirören News Agency that some of the figures still bear traces of the red, blue and pink pigments used to paint them.

"The fact that the dyes on them are partially preserved shows us the color of clothes they wore in their time," he says.

In addition to the terracotta figures, the team found ceramic, bronze, lead and silver artifacts scattered around the Hellenistic theater.

Myra, located near the mouth of the Andriacus River on the southern coast of modern-day Turkey, was an important Mediterranean port city for thousands of years, falling under the control of different regional forces over the centuries. Per Encyclopedia Britannica, it was one of the most important towns in ancient Lycia, a confederation of maritime cities dating back in some form to the 14th century B.C.

In the sixth century B.C., Persian forces conquered Lycia, which later came under Roman control before becoming its own Roman province around the fourth century A.D.

Among Myra's best-known features are rock-cut tombs, many of which look like wooden houses and shrines, carved into its hills between the fifth and third centuries B.C. The city's huge Roman theater, built in the third century A.D., is known as one of the most impressive in Anatolia.

The Hurriyet Daily News notes that excavations at the site have been ongoing for more than a decade. Over the summer, project coordinators brought dozens of researchers and workers to the site in Antalya’s Demre district.

“I can say that the excavations we carried out in the Myra Ancient City Theater this summer gave one of the most important gifts of the year to Anatolian archaeology,” Çevik tells Hurriyet.

In addition to many complete figurines, Live Science reports that the team found more than 50 heads without bodies—discoveries that suggest more artifacts are still waiting to be discovered.

For now, the team is continuing to piece together remnants of additional figurines. It plans to share them with the Museum of Lycian Civilizations in Demre, which will then display the collection to the public.

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Livia Gershon is a freelance journalist based in New Hampshire. She has written for JSTOR Daily, the Daily Beast, the Boston Globe, HuffPost, and Vice, among others.

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Please visit the site: <https://www.smithsonianmag.com/smart-news/dozens-2000-year-old-terracotta-figurines-found-turkey-180976978/>

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## **EGGSTRAORDINARY OBJECTS,** **BY TAMAR HODOS**

In the interconnected world of the ancient Greeks, Phoenicians, Assyrians, and Egyptians, ostrich eggs were coveted by elites across the Mediterranean and Middle East. Ostrich eggs?

The eggs were decorated with ornate carved or painted motifs, and frequently fashioned into vessels with metal fittings to create cups and jugs. They have been found primarily in funerary contexts from Iberia to Mesopotamia. Their widespread distribution, particularly during the first millennium BCE, reflects a shared understanding of what it meant to be rich, as well as the more bespoke significance of eggs in each particular cultural context. This demonstrates the balance between shared practices and localised differences between groups connected in globalisation settings.

Most previous scholarship on the eggs focused on asking who decorated them. Suggestions were based upon stylistic similarity to other contemporary worked media, such as carved ivory. This resulted in a simple assumption that style is the same as ethnic identity. What is problematic, particularly for the first millennium BCE, is that we know that craftsmen were mobile, and some of them worked for foreign rulers and elite patrons.

For example, foreign craftsmen were known to have worked for Assyrian kings in Assyria. So how should we consider a product made by such an artisan? Should we call it Assyrian or identify it with the origin of the maker? Such questions are incredibly relevant to society today, because our own identities cannot necessarily be understood simply from what we might look like.

Interpreting social identities, and social life, from material evidence is fundamental to archaeology. Therefore, we took an archaeological approach to the question of the production and distribution of decorated ostrich eggs, of which the “who” of previous scholarship is a part. Instead, our primary question asked, “What is the production process?” This meant understanding where an egg could be sourced from and whether the manufacture methods could be related to techniques and materials used by artisans working in specific areas. Such an approach moves us away from equating style with a fixed ethnic identity.

The project, in collaboration with colleagues at the British Museum and Durham University, assessed specifically where eggs were laid, whether the mother was wild or captive, and how the eggs were worked.

We used a variety of methodologies, including high resolution and scanning electron microscopy, and isotopic analyses. We also undertook some experimental work ourselves.

What we learned was that the entire system of decorated ostrich egg production was much more complicated than we had imagined! It turns out that just because you could source an ostrich egg locally, it does not necessarily mean that you did. Mediterranean

ostriches were indigenous to the eastern Mediterranean and North Africa. Using a variety of isotopic indicators, we were able to distinguish eggs laid in different climatic zones (cooler, wetter vs. hotter, drier).

What was most surprising to us was that sites in both zones had eggs from the other zone as well as their own. This raises new questions, such as, "Were the unworked eggs themselves traded?" and, "Did eggs from different areas have different perceived values?" I cannot help but wonder if it is similar to brown vs. white chicken eggs today: there is no nutritional or taste difference between them. The colour depends upon the ear feather and lobe colour of the breed, believe it or not. Yet in regions where white eggs are predominant, brown eggs are more expensive, and vice versa. The "value" difference is entirely of our own social making.

We also believe that the ancient ostrich eggs were sourced from the wild, rather than from captive birds, despite evidence of ostriches being kept successfully in captivity in some places during this period. This is based upon isotopic data that reflects what the laying bird consumed during ovulation, as well as lines visible only via the scanning electron microscope that maybe derived from environmental stress, rather than polishing or decorating techniques, which we could also distinguish.

This means that there had to be trackers, who had to find nest sites and steal eggs by one means or another. Ostrich nests are difficult to spot because they are dug into the ground amid grasses such that they are invisible from across the landscape. The female's coloring further camouflages the site during the day, when she incubates the eggs; the male's coloring does the same at night, when he keeps the eggs warm.

An ostrich will lay its head flat if it senses a predator, which is the origin of the notion that ostriches bury their heads in the sand.

But do not take that as passiveness: the birds can kill with a single kick. The Assyrians used imagery of the lashing-out ostrich as a dangerous beast to promote belief in the king's strength and might.

Acquiring eggs entailed risk to the tracker. Firstly, it could take days to find nest sites, since a male ostrich's territory may extend up to 20km<sup>2</sup>, and nest locations seem to have no relation to nest sites from previous seasons within a territory. Secondly, other predators equally dangerous to humans inhabited the same landscapes as the ostriches. So even if the tracker chose to kill an ostrich rather than merely steal its eggs, the bird itself was not the only threat.

We also learned that an egg needs to dry out naturally for an extended period of time after emptying before the shell is suitable for carving. The eggs therefore needed to be stored safely somewhere. This has economic implications, since storage necessitates a long-term investment in producing the finished product. No doubt this added to an egg's luxury value as much as the fact that it was risky to acquire in the first place.

Only once an egg was suitably dried could those highly skilled craftsmen undertake their decoration. But was the egg decorator the same person who then added the metal rim and spout to turn the decorated egg into a jug? We can see the sequence of working on the eggshells themselves, such as where the motif has been smoothed away in preparation for

a spout. We assume a degree of craft specialisation, since metalworking requires very different skill sets, and working environments, than egg carving and painting. No one has previously delved down into the making of these artefacts to consider these aspects of their production, however.

Finally, what does it mean when a deceased Etruscan king in Italy was interred with a decorated ostrich egg? Or a Phoenician residing in Spain? How do those meanings overlap and differ? As the eggs were imports to both regions, what does this tell us about the varieties of socio-cultural and economic connections between ostrich egg using cultures?

The ostrich egg study used the mobility of objects to learn about the variety of people involved in production and exchange in the past, as well as shared and divergent social practices of materials in common between groups. But its relevance does not lie just in learning more about the ancient world. This approach is applicable to contemporary society because of our own social relationships with the material world.

Today, the same object may concurrently have overlapping and different social or symbolic meanings for diverse populations, while its production and distribution connects people in complex ways across time and place. Understanding the relationships between our social lives and material worlds helps us foster better relationships with one another, especially with regard to social and cultural differences. Objects ‘belong’ to many more than just their final consumers. Luxuries extend across the full spectrum of society.

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**Please visit the site: <https://www.asor.org/onetoday/2021/02/eggstraordinary-objects>  
[Go there for pix and caps]**



## **EGYPT: ARCHAEOLOGISTS UNEARTH ANCIENT BEER FACTORY IN ABYDOS, BY SAMY MAGDY**

American and Egyptian archaeologists have unearthed what could be the oldest known beer factory at one of the most prominent archaeological sites of ancient Egypt, a top antiquities official said on Wednesday.

Mostafa Waziri, secretary general of the Supreme Council of Antiquities, said the factory was found in Abydos, an ancient burial ground located in the desert west of the Nile River, over 450 kilometers (280 miles) south of Cairo.

He said the factory apparently dates back to the region of King Narmer, who is widely known for his unification of ancient Egypt at the beginning of the First Dynastic Period (3150 B.C.- 2613 B.C.).

Archaeologists found eight huge units — each is 20 meters (about 65 feet) long and 2.5 meters (about 8 feet) wide. Each unit includes some 40 pottery basins in two rows, which had been used to heat up a mixture of grains and water to produce beer, Waziri said.

The joint mission is co-chaired by Dr. Matthew Adams of the Institute of Fine Arts, New York University, and Deborah Vischak, assistant professor of ancient Egyptian art history and archaeology at Princeton University.

Adams said the factory was apparently built in this area to provide royal rituals with beer, given that archaeologists found evidences showing the use of beer in sacrificial rites of ancient Egyptians.

British archaeologists were the first to mention the existence of that factory early 1900s, but they couldn't determine its location, the antiquities ministry said.

With its vast cemeteries and temples from the earliest times of ancient Egypt, Abydos was known for monuments honoring Osiris, ancient Egypt's god of underworld and the deity responsible for judging souls in the afterlife.

The necropolis had been used in every period of early Egyptian history, from the prehistoric age to Roman times. Egypt has announced dozens of ancient discoveries in the past couple of years, in the hope of attracting more tourists.

The tourism industry has been reeling from the political turmoil following the 2011 popular uprising that toppled longtime autocrat Hosni Mubarak. The sector was also dealt a further blow last year by the coronavirus pandemic.

**Please visit the site: <https://tinyurl.com/y6w4jrjr>**



## **NEVER-BEFORE-SEEN 'MUD MUMMY' FROM EGYPT DISCOVERED IN WRONG COFFIN, BY LAURA GEGGEL**

The discovery of a rare "mud mummy" from ancient Egypt has surprised archaeologists, who weren't expecting to find the deceased encased in a hardened mud shell.

The "mud carapace" is an unparalleled find; it reveals "a mortuary treatment not previously documented in the Egyptian archaeological record," the researchers wrote in the study, published online Wednesday (Feb. 3) in the journal PLOS One.

It's possible the "mud wrap" was used to stabilize the mummy after it was damaged, but the mud may have also been meant to emulate practices used by society's elite, who were sometimes mummified with imported resin-based materials during a nearly 350-year period, from the late New Kingdom to the 21st Dynasty (about 1294 B.C. to 945 B.C.), the researchers said.

So, why was this individual covered with mud, rather than resin? "Mud is a more affordable material," study lead researcher Karin Sowada, a research fellow in the Department of History and Archaeology at Macquarie University in Sydney, Australia, told Live Science in an email.

The mud sheath isn't the mummy's only oddity. The mummy, dated to about 1207 B.C., was damaged after death, and was even interred in the wrong coffin actually meant for a woman who died more recently, the researchers found.

Like many ancient Egyptian mummies, the "mud mummy" and its lidded coffin were acquired in the 1800s by a Western collector, in this case, Sir Charles Nicholson, an English-Australian politician who brought it to Australia. Nicholson donated them to the University of Sydney in 1860, and today they reside at the university's Chau Chak Wing Museum. But it appears that whoever sold the artifacts tricked Nicholson; the coffin is younger than the body buried in it, the researchers found.

"Local dealers likely placed an unrelated mummified body in the coffin to sell a more complete 'set,' a well-known practice in the local antiquities trade," the researchers wrote in the study. The coffin is inscribed with a woman's name — Meruah or Meru(t)ah — and dates to about 1000 B.C., according to iconography decorating it, meaning the coffin is about 200 years younger than the mummy in it.

While the individual isn't Meruah, anatomical clues hint that it is a female who died between the ages of 26 and 35, the researchers said.

Researchers got their first inkling that the 3,400-year-old mummy was unusual in 1999, when a CT (computed tomography) scan revealed something strange inside. To investigate, the researcher extracted a few samples of the wrappings and discovered they contained a sandy mud mixture. When a new team of researchers re-scanned the mummy

in 2017, they uncovered previously unknown details about the carapace, especially when they chemically reexamined the mud fragments.

After she died, the woman was mummified and wrapped in textiles. Then, her remains, including her left knee and lower leg, were damaged in "unknown circumstances," possibly by grave robbers, which prompted someone to repair her mummy, likely within one to two generations of her first burial — a feat that included "rewrapping, packing and padding with textiles, and application of the mud carapace," the researchers wrote in the study.

Whoever repaired the mummy made a complicated earthy sandwich, placing a batter of mud, sand and straw between layers of linen wrappings. The bottom of the mud mixture had a base coat of a white calcite-based pigment, while its top was coated with ochre, a red mineral pigment, Sowada said. "The mud was apparently applied in sheets while still damp and pliable," she said. "The body was wrapped with linen wrappings, the carapace applied, and then further wrappings placed over it."

Later, the mummy was damaged again, this time on the right side of the neck and head. Because this damage affects all of the layers, including the muddy carapace, it appears this damage was more recent and prompted the insertion of metal pins to stabilize the damaged areas at the time, the researchers said.

This "mud mummy" isn't the only ancient Egyptian mummy subject to post-mortem repair; the body of King Seti I was wrapped more than once, and so were the remains of King Amenhotep III (King Tut's grandfather), the researchers noted.

As for the woman's mud carapace, "this is a genuinely new discovery in Egyptian mummification," Sowada said. "This study assists in constructing a bigger — and a more nuanced — picture of how the ancient Egyptians treated and prepared their dead."

**Please visit the site: <https://www.livescience.com/ancient-egyptian-mud-mummy.html>**

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## **NEANDERTHALS AND HOMO SAPIENS USED IDENTICAL NUBIAN TECHNOLOGY**

Long held in a private collection, the newly analysed tooth of an approximately 9-year-old Neanderthal child marks the hominin's southernmost known range. Analysis of the associated archaeological assemblage suggests Neanderthals used Nubian Levallois technology, previously thought to be restricted to Homo sapiens.

With a high concentration of cave sites harbouring evidence of past populations and their behaviour, the Levant is a major centre for human origins research. For over a century, archaeological excavations in the Levant have produced human fossils and stone tool assemblages that reveal landscapes inhabited by both Neanderthals and Homo sapiens, making this region a potential mixing ground between populations. Distinguishing these populations by stone tool assemblages alone is difficult, but one technology, the distinct Nubian Levallois method, is argued to have been produced only by Homo sapiens.

In a new study published in Scientific Reports, researchers from the Max Planck Institute for the Science of Human History teamed up with international partners to re-examine the fossil and archaeological record of Shukbah Cave. Their findings extend the southernmost known range of Neanderthals and suggest that our now-extinct relatives made use of a technology previously argued to be a trademark of modern humans. This study marks the first time the lone human tooth from the site has been studied in detail, in combination with a major comparative study examining the stone tool assemblage.

"Sites where hominin fossils are directly associated with stone tool assemblages remain a rarity - but the study of both fossils and tools is critical for understanding hominin occupations of Shukbah Cave and the larger region," says lead author Dr Jimbob Blinkhorn, formerly of Royal Holloway, University of London and now with the Pan-African Evolution Research Group (Max Planck Institute for the Science of Human History).

Shukbah Cave was first excavated in the spring of 1928 by Dorothy Garrod, who reported a rich assemblage of animal bones and Mousterian-style stone tools cemented in breccia deposits, often concentrated in well-marked hearths. She also identified a large, unique human molar. However, the specimen was kept in a private collection for most of the 20th century, prohibiting comparative studies using modern methods. The recent re-identification of the tooth at the Natural History Museum in London has led to new detailed work on the Shukbah collections.

"Professor Garrod immediately saw how distinctive this tooth was. We've examined the size, shape and both the external and internal 3D structure of the tooth, and compared that to Holocene and Pleistocene Homo sapiens and Neanderthal specimens. This has enabled us to clearly characterise the tooth as belonging to an approximately 9 year old Neanderthal child," says Dr. Clément Zanolli, from Université de Bordeaux. "Shukbah marks the southernmost extent of the Neanderthal range known to date," adds Zanolli.

Although Homo sapiens and Neanderthals shared the use of a wide suite of stone tool technologies, Nubian Levallois technology has recently been argued to have been exclusively used by Homo sapiens. The argument has been made particularly in southwest Asia, where Nubian Levallois tools have been used to track human dispersals in the absence of fossils.

"Illustrations of the stone tool collections from Shukbah hinted at the presence of Nubian Levallois technology so we revisited the collections to investigate further. In the end, we identified many more artefacts produced using the Nubian Levallois methods than we had anticipated," says Blinkhorn. "This is the first time they've been found in direct association with Neanderthal fossils, which suggests we can't make a simple link between this technology and Homo sapiens."

"Southwest Asia is a dynamic region in terms of hominin demography, behaviour and environmental change, and may be particularly important to examine interactions between Neanderthals and Homo sapiens," adds Prof Simon Blockley, of Royal Holloway, University of London. "This study highlights the geographic range of Neanderthal populations and their behavioural flexibility, but also issues a timely note of caution that there are no straightforward links between particular hominins and specific stone tool technologies."

"Up to now we have no direct evidence of a Neanderthal presence in Africa," said Prof Chris Stringer of the Natural History Museum. "But the southerly location of Shukbah, only about 400 km from Cairo, should remind us that they may have even dispersed into Africa at times."

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Researchers involved in this study include scholars from the Max Planck Institute for the Science of Human History, Royal Holloway, University of London, the Université de Bordeaux, the Max Planck Institute for Chemical Ecology, the University of Malta, and the Natural History Museum, London. This work was supported by the Leverhulme trust (RPH-2017-087).

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Please visit the site: [https://www.eurekalert.org/pub\\_releases/2021-02/mpif-nah020921.php](https://www.eurekalert.org/pub_releases/2021-02/mpif-nah020921.php) [Go there for pix]

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## **EGYPTIAN PHARAOH WAS EXECUTED ON THE BATTLEFIELD, MUMMY REVEALS, BY STEPHANIE PAPPAS**

Egyptian pharaoh Seqenenre Taa II may have died on the battlefield, overwhelmed by attackers armed with daggers, axes and spears.

That's according to a new computed tomography (CT) study of the pharaoh's damaged mummy, which revealed new facial wounds that ancient embalmers tried to disguise. The pharaoh had a huge slice in his forehead, cuts around his eyes and cheeks, and a stab wound at the base of the skull that may have reached the brain stem. The attackers, it seems, surrounded the defeated ruler on every side.

"This suggests that Seqenenre was really on the front line with his soldiers, risking his life to liberate Egypt," study lead author Sahar Saleem, a professor of radiology at Cairo University, said in a statement.

### **A war over hippos**

Seqenenre Taa II (also spelled Seqenenre Tao II) was the ruler of southern Egypt between about 1558 B.C. and 1553 B.C., during the occupation of Egypt by the Hyksos, a people who probably came from the Levant. The Hyksos controlled northern Egypt and required tribute from the southern part of the kingdom. According to fragmentary papyrus accounts, Seqenenre Taa II revolted against the occupiers after receiving a complaint from the Hyksos king that the noise of hippos in a sacred pool in Thebes was disturbing his sleep. The king lived in the capital city of Avaris, 400 miles (644 kilometers) away.

On this trumped-up charge, the Hyksos king demanded the sacred pool be destroyed — a grave insult to Seqenenre Taa II.

This insult may have been the prelude to war. Text on a carved rock slab found in Thebes recounts that Seqenenre Taa II's son and immediate successor, Kamose, died in battle against the Hyksos.

No one knew what had happened to the pharaoh, even after his mummy was discovered in 1886. Archaeologists noticed wounds on the skull and speculated that he'd been killed in battle or perhaps murdered in a palace coup. The 19th-century archaeologists who found the mummy reported a foul smell when they unwrapped it, leading them to suspect that the mummy had been hastily embalmed on the battlefield.

The new study uses X-rays from multiple angles to build a 3D image of the pharaoh's mummy. The pharaoh's remains are in poor condition, with bones disarticulated and the head detached from the rest of the body.

### **Violent death**

Nevertheless, the wounds on the skull tell the story of a brutal death. The pharaoh had a 2.75-inch-long (7 centimeters) cut across his forehead, which would have been delivered from an ax or sword stroke from above. This wound alone could have been fatal. Another potentially fatal slice above the pharaoh's right eye was 1.25 inches (3.2 cm) long and possibly made by an ax. More cuts on the nose, right eye and right cheek came from the right and from above and may have been delivered with an ax handle or blunt staff, the researchers said.

Meanwhile, someone in front of the king swung a sword or an ax at the pharaoh's left cheek, leaving another deep slice. From the left, a weapon — probably a spear — penetrated the base of his skull, leaving a 1.4-inch-long (3.5 cm) wound.

Early archaeologists had previously reported many of these wounds, but Saleem and her colleague, Egyptologist Zahi Hawass, discovered a new set of skull fractures covered by embalming material. Concentrated on the right side of the skull, the damage seems to have been caused by a dagger and a heavy, blunt object, perhaps an ax handle.

The mummy's hands were flexed and clenched, but there were no defensive injuries on his forearms, leading the researchers to suggest that perhaps Seqenenre Taa II's hands were bound when he died. He may have been captured on the battlefield and executed by multiple attackers, Saleem said in the statement.

Although researchers have discovered pharaoh mummies with violent wounds before, there had been no evidence of pharaoh battlefield deaths until now, Saleem told Live Science. For example, Ramesses III had his throat cut in a palace coup, she said. Historical accounts tell of Ramesses II and Thutmose III taking part in battle, but there is no evidence of injuries on their mummies. The mummy of an unidentified nobleman had an arrow embedded in its chest, Saleem said, which may have occurred in battle.

The fact that embalmers tried to patch up Seqenenre Taa II's skull wounds suggests that he wasn't hastily embalmed, the researchers wrote in their new study, published today (Feb. 17) in the journal *Frontiers in Medicine*. The pharaoh's desiccated brain was also stuck to the left side of his skull, suggesting that someone laid him on his side after his death, either at the place where he fell or while his body was being transported for embalming.

Seqenenre Taa II may have lost his life in battle, but his successors eventually won the war. After Kamose died, Seqenenre Taa II's consort, Ahhotep I, likely acted as regent, continuing the rebellion against the Hyskos. When Seqenenre Taa II and Ahhotep I's son Ahmose I came of age, he inherited the throne and finally pushed out the foreign occupiers. Ahmose I would unify Egypt and launch the New Kingdom, the period of ancient Egypt's peak power between the 16th and 11th centuries B.C.

Originally published on Live Science

Please visit the site: <https://www.livescience.com/egyptian-pharaoh-battlefield-death.html> [Go there for pix]

## **HOW DID ANCIENT EGYPTIANS BAKE?** **AFTER 54 LOAVES, SCHOLAR FINDS** **ANSWERS, BY ROSSELLA TERCATIN**

The technique implies covering the inside of the conical bread moulds with a layer of fine sandy clay, heating the moulds up horizontally and shaping the dough in advance into elongated pieces.

How did the Egyptians bake bread some 4,500 years ago? The question has puzzled archaeologists for many years, in light of the profusion of cooking vessel remains and even iconographic evidence that pointed toward the Israelites' nemesis baked their dough in conical molds.

Until one researcher decided to take the matter literally into her own hands and to start baking with one goal in mind: to uncover the technique used to bake bread so many millennia ago, including the recipe.

“The production of bread is well documented for Pharaonic Egypt, particularly through images of food processing that are part of the decoration of Old and Middle Kingdom elite tombs, and so-called bread molds – ceramic cooking utensils found in large numbers in archaeological sites,” wrote Dr. Adeline Bats of the Sorbonne University in Paris in a paper recently published in the *Journal of Archaeological Science: Reports*. “Nevertheless, despite this rich documentation, the chaîne opératoire is not well known and understood.”

Bats started the project, which was part of her doctoral dissertation, by analyzing the iconography. During the Old Kingdom (2750–2250 BCE), most of the images, usually featured in burial places, could be grouped into three categories: heating the mold in the fire, removing it and pouring liquid into its interior. During the Middle Kingdom, molds appeared to be heated up in a fireplace and then filled with semi-solid dough.

For her experiments, the archaeologist decided to heat and bake the bread in open fireplaces in shallow pits.

“For all the experiments, several bread molds were either produced in Aubechies (Belgium) or Ain Sukhna (Egypt), each time using local clay. Fresh donkey dung and gravel were used as temper. The ceramics were fired in open fireplaces at temperatures between 850° C and 950° C,” she pointed out.

While for millennia, bread has been a staple of human diet prepared by kneading a mixture of flour and water, the specific recipe used by Egyptians at the time was not known. Organic findings from the relevant archaeological sites indicated two types of grain were cultivated at the time, common barley and emmer wheat.

"It was essential to work with at least one of these plants, which are very rarely cultivated in the world today. So, R. Feuillas, a farmer-baker and specialist in ‘old wheat’ varieties,



was asked to participate in this research project. R. Feuillas provided an organic ‘black emmer’ flour. This cereal was used during all the experiments.

Emmer produces a tasty, low gluten and highly digestible flour,” Bats noted.

“In the absence of reliable data regarding the use of yeast and sourdough in association with the conical molds of the Middle Kingdom, I opted to carry out several tests with sourdough starter of einkorn (*Triticum monococcum*) at our disposal, or long spontaneous fermentations,” she wrote.

The researcher carried out several experiments, with different mixtures, temperatures and humidity levels, with the goal of producing “a perfectly baked bread (with no trace of charring or a semi-baked mushy appearance) that would release itself perfectly from the ceramic without breaking it.”

Some 54 loaves were produced during the study. After several attempts, the most successful dough was the one comprised of 1 kg. of 100% bran black emmer, 15 gr. of salt, 170 gr. of einkorn sourdough starter and 750 gr. of water.

The technique implies covering the inside of the conical bread molds with a layer of fine sandy clay, heating the molds up horizontally and shaping the dough in advance into elongated pieces.

“In accordance with certain iconographic representations, the molds were staggered and rolled regularly (every five minutes in order to maintain a rhythm and to record temperatures), a positioning facilitated by the conical shape of the ceramics,” Bats added. “After 60 minutes of baking between 100° C and 120° C, the dough was completely baked. During the firing process, it slightly detached from the ceramic and a crust formed on the outside. On the inside, thanks to the presence of sourdough starter, a dense honeycomb formed, allowing a good distribution of hot air during baking.”

In this way, the molds were not broken while taking out the loaves, and only a small quantity of charcoals was used to bake several breads at the same time.

“In my dream, similarly, there were three openwork baskets on my head.

In the uppermost basket were all kinds of food for Pharaoh that a baker prepares; and the birds were eating it out of the basket above my head,” Pharaoh’s chief baker tells Joseph in the biblical Book of Genesis, as the two find themselves in prison together along with the King of Egypt’s chief cupbearer.

Were some of the foods he prepared for Pharaoh baked in a conical mold? This mystery might remain hard to solve.

**Please visit the site: <https://www.jpost.com/archaeology/how-did-ancient-egyptians-bake-after-54-loaves-scholar-finds-answers-659163>**



## ANCIENT LARNACA CEMETERY

An ancient cemetery was found recently as a result of anti-flooding works in the city of Larnaca, Cyprus. Dating back to the 12th century BC, but in use up to Roman times, the find is considered quite significant by archaeologists.

The cemetery, which contained approximately ten graves, was uncovered on Larnaca's Petrakis Kyprianou Street during excavations for the "S9" antiflooding project, in which gigantic drainage pipes are being laid under the street.

Polina Christofi, an archaeologist at Cyprus' Department of Antiquities, says that "numerous" archaeological discoveries have been made in the last year in the ancient city of Larnaca as a result of the enormous project.

The street under which the new drainage is being constructed was already known to have been in the middle of all the necropolises of ancient Kition.

The Cyprus News Agency, in a report on the find, stated that Christofi said that more than 60 tombs have been identified along Petrakis Kyprianou Street and its side streets, which date all the way back to the 12th century BC and up to the Roman period.

The oldest tombs were fewer in number and constructed in a more rough way compared to the later graves, according to Christofi. "These are tombs carved from the natural rock of the area and are of a rectangular floor plan," she explained to the Cyprus Mail.

The archaeologist went on to say that even at that time, people could only gain access to the tombs by a set of stairs. All the movable objects from the finds, after being documented, were transferred to the Larnaca district's archaeological museum for preservation and storage, according to Christofi.

Naturally, the care taken to manage this process with respect for the remains also means significant delays regarding the much-needed construction of the rainwater drainage system for the city.

Angelos Hadjiharalambous, the head of the Larnaca Sewage Board, told the Cyprus News Agency that the drainage project was indeed a very important project, but the discovery of antiquities has greatly delayed its completion.

### **Possible further delays if additional graves found**

The official explained that workers were just about to lay the last 170 meters (558 feet) of pipeline along Petrakis Kyprianou Street when they came across the ancient cemetery. Ever since that time, because of all the delays which took place, they have only been able to lay five meters (15 feet) of pipeline per week, he said.

"In the event the cemetery grounds extend throughout the entirety of Petrakis Kyprianou Street, then a great delay is expected as regards the project," Hadjiharalambous stated.

Of course, the additional time lag translates to a great increase in costs for the desperately- needed drainage project. The anti-flooding measures are expected to provide

a solution “to the many and serious problems faced in the area with rainwater and heavy rainfall observed in Cyprus in recent years,” he explained.

The approximately five-foot diameter drainage pipe will serve the areas of Mitropolis and Prodromos, which are “very sensitive areas with multiple and long-term problems regarding rainfall,” Hadjiharalambous stated.

**Please visit the site: <https://greekreporter.com/2021/01/08/ancient-cemetery-discovered-under-street-in-larnaca-cyprus/> [Go there for pix]**

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## **HIDDEN SCENES IN ANCIENT ETRUSCAN PAINTINGS REVEALED, BY OWEN JARUS**

Scientists using a new technique have uncovered the colorful and once-hidden scenes in paintings of the ancient Etruscans, a group of people who flourished on the Italian peninsula around 2,500 years ago at a time before Rome became powerful.

For instance, they found new details in a painting from the "Tomb of the Monkey" and scenes of an underworld in another work of art.

The Etruscans created detailed paintings, but the passage of time has meant that many of them are now only partly visible and that much of their color has been lost.

"A major issue is the significant loss of information on the polychromy [colors] of the preserved paintings, with special regard to some specific colors owing to their physical chemical composition," Gloria Adinolfi, a researcher at Pegaso Srl Archeologia Arte Archeometria (a research institute), said in a presentation given Jan. 8 at the virtual joint annual meeting of the Archaeological Institute of America and the Society for Classical Studies.

The fact that some colors survive the passage of time better than others can give a distorted view of what ancient paintings looked like at the time they were painted, Adinolfi said. For example, some shades of green tend not to survive well, whereas red often does, she said.

"Red oaks usually seem to be more resistant so that sometimes reds are dominant and alter the correct perception of the original polychromy of the pictorial decoration," Adinolfi said.

### **Revealing ancient paintings**

To reveal the paintings, the scientists used a technique called multi-illumination hyperspectral extraction (MHX), which involves taking dozens of images in the visible, infrared and ultraviolet bands of light and processing them using statistical algorithms developed at the National Research Council of Italy in Pisa, said team member Vincenzo Palleschi, a senior researcher at the research council.

The technique can detect Egyptian blue, a color developed in ancient Egypt that "has a very specific response in a single spectral band," Palleschi said. The team also analyzed the residual remains of other remaining colors to help determine what colors were in the painting.

By combining the MHX and color analyses, the team revealed vanished scenes from ancient Etruscan paintings. The researchers unveiled several examples during the presentation, including details of paintings depicting the Etruscan underworld showing rocks, trees and water.

In the Tomb of the Monkey, so named because a painting in the tomb shows a monkey on a tree, the researchers uncovered details of a painting depicting a person. To the naked

eye, the painting looks like a red blur, but after the MHX and color analyses were complete, the painting clearly showed a person carrying an object and details of their hair and face. The tomb was discovered in the 19th century but now, with the new technology, the painting has become much more visible.

The team's research is ongoing, and more paintings may be revealed in the future.

Please visit the site: <https://www.livescience.com/ancient-etruscan-paintings-hidden-images.html>

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## **POMPEII: ARCHAEOLOGISTS UNVEIL CEREMONIAL CHARIOT DISCOVERY**

Archaeologists in Italy have unveiled a ceremonial chariot they discovered near the ancient Roman city of Pompeii.

The four-wheeled carriage was found near a stable where three horses were uncovered back in 2018.

Experts believe it was likely used in festivities and parades, with the find described as "exceptional" and "in an excellent state of preservation".

Pompeii, engulfed by a volcanic eruption from Mount Vesuvius in AD79, is an archaeological treasure trove.

The volcanic eruption buried the city in a thick layer of ash, preserving many of its residents and buildings.

The chariot was found in a double-level portico connected to stables at an ancient villa at Civita Giuliana, north of the walls of the ancient city.

A statement by the park described the ceremonial chariot as having "iron components, beautiful bronze and tin decorations" as well as ropes and floral decoration discovered "almost intact".

Archaeologists say efforts to safely free the chariot took weeks after it first emerged during an excavation effort on 7 January.

They said the fragility of the materials involved made their effort particularly complex, with special techniques, including plaster moulding, used to uncover it without damage.

The operation was carried out in collaboration with a local prosecutor's office amid criminal efforts to loot items of cultural heritage from the site using means such as illegal tunnels.

### **'Extraordinary discovery'**

Officials described the carriage as without parallel among other finds in Italy.

"This is an extraordinary discovery that advances our understanding of the ancient world," Massimo Osanna, the director of the site, said in a press release.

He said some of the ornate decorations on the chariot allude to it being used for community festivities, possibly including wedding ceremonies.

"Considering that the ancient sources allude to the use of the Pileum by priestesses and ladies, one cannot exclude the possibility that this could have been a chariot used for rituals relating to marriage, for leading the bride to her new household," he said.

Dario Franceschini, Italy's Culture Minister, said Pompeii "continues to amaze us with its discoveries and it will do so for many years, with 20 hectares still to be dug up".

The ancient city, which lies around 23km (14 miles) to the south-east of Naples, is a Unesco world heritage site.

It is usually one of Italy's most popular tourist spots but is currently closed due to the coronavirus pandemic.

**Please visit the site: <https://www.bbc.com/news/world-europe-56222992> [Go there for pix of medallions]**

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## **HOW THE ANCIENT GREEKS SET US ON THE PATH TO MARS, BY DUNCAN HOWITT-MARSHALL**

Long before landers arrived on Mars, ancient astronomers plotted its path across the night sky and associated it with deities of fire, war and destruction.

The space above planet Mars has been getting busy of late. Two national space agencies, those of China and the UAE, have sent rockets in the past year, each containing sophisticated instruments to study the planet's atmosphere and weather patterns.

They join other orbiters from NASA, the European Space Agency (ESA) and India's own Mars Orbiter Mission. As of 2021, there are as many as 11 functional spacecraft on or above Mars: eight in orbit, three on the surface.

While it is only in recent decades that humanity has acquired the technical means to actually reach Mars, our fascination with the red planet can be traced back thousands of years to hallowed antiquity, when ancient Babylonian, Assyrian, and Egyptian stargazers made complex observations of Mars and other planets visible to the naked eye.

Subsequently, the ancient Greeks built on the work of their predecessors and developed an even deeper understanding of the cosmos, its structure and origins, by weaving together a rich tapestry of astronomy (largely based on mathematics), philosophy, mythology, and symbolism. Their millennia-old contributions laid the groundwork for much of our understanding of the solar system, setting us on the path to the modern-day exploration of Mars.

### **THE DEVELOPMENT OF ANCIENT GREEK ASTRONOMY**

Western astronomy has its origins in ancient Mesopotamia ("the land between the rivers" – the Tigris and Euphrates), where Babylonian mathematicians and astronomers carefully observed and recorded celestial objects and astronomical events such as lunar and solar eclipses, and associated the red glow of Mars in the night sky with Nergal, god of war and strife.

They developed advanced arithmetical techniques to calculate the timing of these phenomena for rituals and religious purposes, similar to the ancient Maya in Central America. The ancient Britons and Polynesians also developed systems to track the movements of the Sun and the moon.

The ancient Egyptians were the first to notice that the stars were fixed and the Sun moved relative to the stars. They plotted the approximate positions of Mercury, Mars, Venus, Jupiter and Saturn, all visible to the naked eye, and noted that Mars followed an irregular loop in the night sky. As such, they referred to it as Sekded-ef em khetkhet (meaning "One who travels backward"), or Har Decher – simply, the "Red One".

Influenced by the earlier Babylonian and Egyptian astronomers, the ancient Greeks developed the emerging field of astronomy as a sub-branch of mathematics. Greek stargazers made a significant number of increasingly accurate observations and developed core theories that form the basis of our own understanding of astronomy, including the earliest known heliocentric theory of the solar system.

Aristarchus of Samos (Ἀρίσταρχος ὁ Σάμιος, c. 310–230 BC) was the first to place the Sun (or “central fire”) at the center of the known universe, with the Earth and other known planets revolving around it.

Indeed, the word “planet” comes from the Greek planetes (πλανήτης), meaning “wanderers”. Aristarchus also attempted to calculate the sizes and distances of the moon and the Sun, and speculated, correctly, that stars were other suns.

The first known astronomical calendar is the Antikythera Mechanism, discovered in a shipwreck off the Greek island of Antikythera by sponge divers in 1900. Generally referred to as the oldest analogue computer, its complex construction was based on astronomy and mathematics developed by the Hellenistic astronomers of the third and second centuries BC, including Archimedes of Syracuse (Ἀρχιμήδης, c. 287–212 BC).

The mechanism is remarkable not only for its complexity and precise engineering, including the miniaturization of at least 30 gears, but as a device to accurately calculate the mean positions of the Sun, moon, and five known planets, including Mars.

## **WHAT THE ANCIENT GREEKS KNEW ABOUT MARS**

The five known planets in ancient Greece – Mercury, Venus, Mars, Jupiter and Saturn – are often referred to as the “classical” or “naked-eye planets”. Early Greek astronomers and philosophers, including the shadowy Pythagoras (c. 570–495 BC), correctly observed the irregular movements of the planets in relation to the fixed stars, and were among the first to identify the morning star and the evening star, referred to by Homer, as being the same celestial object of Venus.

Hipparchus of Nicaea (Ἱππαρχος, c. 190–120 BC) erected an early observatory on the island of Rhodes around 150 BC, and set about compiling a star catalogue with approximately 850 entries. He calculated the celestial coordinates for each star using the first known trigonometric table, and developed and improved several astronomical instruments, including the astrolabe (ἀστρολάβος) – an analogue calculator used to measure the angles of celestial objects relative to the Earth.

Hipparchus’ contribution to the early study of the solar system is commemorated in the form of a 93 km-wide impact crater on the surface of Mars, named after him in 1973. An even bigger crater on the moon, 150 km-wide, was also named after the ancient Greek astronomer.

Arguably the most important Greek astronomer was Claudius Ptolemy, or Ptolemaeus (Κλαύδιος Πτολεμαῖος, c. 100–170 AD), an Alexandrian Greek who, building on the data collected by Hipparchus, devised the much vaunted “Planetary System”, a geometric representation of the solar system that could predict the positions of the naked-eye



planets for any desired date and time. Most importantly, the system placed the five planets in order, closest to Earth to furthest away.

Ptolemy was the first astronomer to accurately describe the precise location of Mars, and developed a mathematical solution (epicycle) to account for the complicated retrograde movement of the planet relative to Earth – the irregular loop previously observed by the Egyptians.

Ptolemy's calculations formed the basis for subsequent cosmological models that endured until the time of Copernicus, nearly 14 centuries later.

## **MARS AND THE PERSONIFICATION OF THE GOD, ARES**

The astronomical and astrological symbol of the planet Mars, a circle with a small arrow pointing to the upper right, is a stylized representation of a shield and spear used by Ares (Άρης), the Greek god of war. It is also the gender symbol for male and the alchemical symbol of iron.

Ares was one of the Twelve Olympians, the son of Zeus and Hera. He was mostly reviled by his fellow gods, associating him with bloodlust and the more violent and brutal aspects of war. In Homer's Iliad, he was also depicted as a coward, running away to Mount Olympus when challenged by the Greek hero, Diomedes, to single combat in the Trojan War. His sister, Athena, by contrast, represented the more thoughtful and strategic aspects of war.

Mars' twin moons (or satellites), first discovered by American astronomer Asaph Hall III in 1877, were named Deimos ("terror" or "dread") and Phobos (meaning "panic" or "fear"), the twin sons of Ares and Aphrodite. In the Iliad, they both accompany their father into battle, sowing terror and confusion in the midst of battle.

The ancient Greeks themselves built precious few temples or places of worship in Ares' honour, and the existence of cults were extremely rare. Only the warlike city-state of Sparta bucked the trend, indicative of the cultural divisions that existed between them and the rest of Greece.

The Spartans viewed him as the model soldier, brave, resilient, and strong. They called him Ares Enyalios ("the warlike"), and in the famed agoge, where Spartan youths were sent to train in the arts of war from the age of 7, each company would sacrifice a puppy prior to ritual combat.

## **HOW THE ANCIENT GREEKS HAVE INSPIRED MODERN-DAY MARS EXPLORATION**

Over the course of nearly a millennia, ancient Greek astronomers developed increasingly complex geometric theories in an effort to understand the movement of the planets, placing them more precisely in time and space.

Their calculations enabled a greater understanding of time and time-keeping, key to all civic and religious calendars in ancient Greece. Lunar and solar/seasonal cycles, for example, were vital for agriculture and navigation, and bespoke mechanical devices, like the Antikythera Mechanism, could be used to predict astronomical positions.

As spacecraft amass in orbit around Mars, and sophisticated autonomous landers explore its rocky, barren surface, it is important to remember the collective achievement of the ancient astronomers who first inspired humankind to reach beyond the limits of our own planet.

The reason for the sharp increase in activity on and above Mars is down to fundamental logistics, calculations that were first attempted by ancient astronomers. Once every 26 months, Earth and Mars are aligned, closest in distance (a mere 56 million km – as opposed to 400 million km at its furthest distance) thereby minimising the amount of required fuel.

Hipparchus, Ptolemy et al. paved the way for our understanding of Mars' orbit around the Sun, and its relative position to Earth, laying the foundations for our understanding of the timing and duration of this crucially important launch window.

If successful, Mars exploration, which had its roots in ancient astronomy, will enable humans to land on the planet in the not-too-distant future. At which point, humanity, for the first time in our history, will become a multi-planetary species.

**Please visit the site: <https://www.greece-is.com/how-the-ancient-greeks-set-us-on-the-path-to-mars/>**

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## **TOP 10 HISTORICAL BOARD GAMES**

Try your hand at ten games spanning over 5,000 years of history – including ancient board games still played today, like the Game of Ur, senet, warri, mahjong and chess.

If you're feeling the need to step away from the screen, here are 10 historical board games from the collection – some of which you can still play today. You can buy replicas of some of the games from our online shop.

### **1. The Royal Game of Ur**

The Royal Game of Ur. Wood and shell, found in the Royal Cemetery of Ur, south Iraq, 2600–2400 BC.

The Royal Game of Ur is the oldest playable boardgame in the world, originating around 4,600 years ago in ancient Mesopotamia.

The game's rules were written on a cuneiform tablet by a Babylonian astronomer in 177 BC. From this, curator Irving Finkel was able to decipher the rules – two players compete to race their pieces from one end of the board to the other. The central squares were also used for fortune telling.

If you want to try the game for yourself, you can buy your very own replica from our online shop [here](#).

Discover how to play this game of speed and strategy with Tom Scott and Irving Finkel in this video:

### **2. The Lewis Chessmen**

The Lewis Chessmen. Carved walrus ivory and whales' teeth, found on the Isle of Lewis, Scotland, 1150–1175.

These charismatic chess pieces are the Lewis Chessmen – some of the most iconic objects in the Museum.

Made in Scandinavia in the late 12th century, the skilfully carved chess pieces were found on the Isle of Lewis in Scotland around 1831.

It's thought they belonged to a merchant travelling from Norway to Ireland, and various stories have emerged to explain why they may have been concealed there.

The chessmen are strongly influenced by Norse culture. This is most evident in the figures of the warders or rooks which take the form of berserkers – fierce mythical warriors.

'Check' out all our replica chess sets in our online shop [here](#).

Hear how the Lewis Chessmen are linked to a certain boy wizard in this video:

### 3. Warri

Wooden warri board, Sierra Leone.

Warri is a game of calculation and strategy played widely within West Africa and also popular elsewhere in the world – you might know it as mancala.

The aim of the game is to capture the seeds of your opponent, moving them from their six playing holes to your bank.

This game board was made in Sierra Leone and is notable for its elaborate sculptural base. It's decorated with an animal, possibly a pig.

If you don't have a game board at home, you can play by drawing two rows of six circles on a piece of paper, with an oval at each end, and use 48 marbles, beads, pebbles, or even sweets as your counters.

Find out how to play with a blog from the spruce crafts here ([external link](#)).

### 4. Senet

Ivory game-box for senet. Egypt, 1400–1200BC.

Beloved by Tutankhamun and Queen Nefertari alike, senet is one of the earliest known board games, dating to around 3100 BC.

The game board comprises 30 squares, laid out in three rows of 10. Two players compete to race all their pieces to the end of the board, using casting sticks or bones, rather than dice, to determine the number of squares moved with each throw.

Ivory game-box for senet. Egypt, 1400–1200 BC.

Some boards, like this one made from a hollowed-out piece of wood faced with ivory, have completely blank squares, whereas others include squares decorated with hieroglyphs representing additional game rules.

On this papyrus, dating to around 1250–1150 BC, a lion plays senet with a gazelle, despite having a bit of trouble holding the pieces.

Papyrus with satirical vignettes. Deir el-Medina (Thebes), 1250–1150 BC.

### 5. Mahjong

Set of mahjong tiles made of bone, bamboo, pigment. China, 1800–1900.

First played during the Qing dynasty in China (1644–1912), mahjong is a strategy based game played using tiles. They are traditionally decorated with Chinese characters, bamboo branches and dots, and special tiles are indicated with winds, dragons, flowers and seasons.

This incomplete set has 140 of the original 144 tiles, which are made from bamboo and bone – each tile weighs just six grams.

It is similar in practice to the card game rummy, and four players draw and discard tiles to complete their hand. The aim of the game is to get all 14 of your tiles into four sets and one pair.

Mahjong was introduced to the West in the 19th century, and has grown in popularity internationally since. You can find an exquisitely-made mahjong set in our online shop here, and master the game for yourself.

## **6. The Game of the Goose**

‘The Royal and Entertaining Game of the Goose’. Hand-coloured etching, varnished, framed and backed with green baize. Glasgow, 1800–1820.

The earliest commercially produced board game, the Game of the Goose is a game of chance and luck, involving no strategy at all.

Duke Francesco de Medici first gifted the game, then called *Gioco dell’Oca* to Philip II of Spain between 1574 and 1587, and the pastime quickly spread in popularity throughout Europe. These examples dating from 1774 to the late 19th century include the rules in French, German and Italian.

French, German and Italian versions of the ‘Game of the Goose’

The aim of the game is to get your counter to the centre of the board, moving counterclockwise according to rolls of a die. Some spaces are accompanied by special rules – for example, if you land on number 58 you must start the game again, or if you land on number 19 you might pay a forfeit and drink until your next turn. Players must score a perfect 63 to win the game.

To play ‘Game of the Goose’ at home, simply copy or print out any of the versions linked in the captions above, which handily hold all the rules on the board, find two dice, and enjoy!

## **7. Ajax and Achilles’ game of dice**

Made in Athens around 530 BC, this amphora shows Ajax and Achilles – two of the heroes of the Trojan war – playing a board game, possibly with pessi, or dice.

Seven counters or dice are visible on the game board, and Ajax reaches out to pick up one of his pieces for the next throw, as they pass the hours between the fighting.

We can’t be sure what game they were playing, or how the dice were scored, but an equivalent might be backgammon, which involves both counters and dice. It dates back nearly 5,000 years to Mesopotamia, and versions were played in the Byzantine Empire in 5th-century and in 6th-century Persia.

Hear from curator Irving Finkel about the history of board games – including chess and backgammon – in this audio clip.

Curator Victoria Donnellan invites us into the world of Ajax and Achilles' game in this video:

## 8. Sugoroku

New Board Game of the Four Ranks (Shi-nō-kō-shō shin sugoroku.  
Woodblock print, Japan, 18th century.

First brought to Japan from China in the 8th century, sugoroku was originally a complex game played by two people with a pair of dice and fifteen counters each, popular among the Japanese elite.

Affordable woodblock-printed sugoroku sheets were developed in the Edo period (1615–1868), meaning this form of the game – e-sugoroku – meaning ‘picture sugoroku’, could be played widely. It is similar in style to western snakes and ladders, and this 18th-century example uses the hierarchical status system, from merchant to artisan, farmer and warrior in ascending order.

It can be played by two or more people, who advance their pieces according to dice rolls around a clockwise spiral. Each player starts at the ‘merchant’ square, in the bottom right-hand corner, and the goal is to reach the largest square in the centre – ‘daimyo lord’s first arrow shooting of the year’, with a picture of a samurai drawing his bow in the presence of high-ranking courtiers.

Each square is illustrated with a different occupation, including fishmongers, pharmacists, plasterers, priests, doctors and scholars.  
Print the game out and play it for yourself to see if you can spot them all – you’ll just need dice and some counters to get started.

## 9. Pachisi

(Left) A beadwork gaming board for pachisi, north west India, 1850–1900, (Right) A cotton and velvet game board for pachisi, Sri Lanka, 19th century

Pachisi is an Indian game played since at least the 16th century on a board shaped like a symmetrical cross. The aim of the game is to move all four of your pieces around the board before your opponents do, with the central square acting as the start and finish point.

The number of spaces moved on each turn is determined by a throw, traditionally of cowrie shells, and the number of shells which land with their opening upwards dictates the number of spaces moved. In other iterations of the game, shells are replaced by beehive-shaped pieces, like these below.

12 pachisi pieces made of crystal. Assam, India, 19th century The name of the game is derived from the Hindi word paccīs, meaning twenty-five – the largest score possible with one throw, where none of the pieces land upside down, and so the game is also known as Twenty Five.

The principles of pachisi were taken to create Ludo – a simplified version of the same game – in England in 1896. Find out more here.

### **10. Mehen**

A pale-yellow limestone circular game for mehen. Egypt, Early Dynastic period (around 2925–2575 BC).

Named after the Egyptian snake god, Mehen was played from around 3000 BC until 2300 BC.

The game board is in the shape of a coiled snake, whose body is divided up into rectangular segments, and teams of up to six players race from the tail to the head and back again, with additional lion-shaped gaming pieces.

The rules and scoring system of Mehen are unknown, but a modern equivalent might be Hyena – a North African game where players race a mother piece along a spiral track from the outside (the village), to the centre (the well), and back. The first to finish wins and releases a hyena, which also travels along the spiral, eating other players' pieces as it goes!

**Please visit the site: <https://blog.britishmuseum.org/top-10-historical-board-games>  
[Go there for pix, videos, and linx to rules]**

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