

## REGISTRATION

Please use the on-line registration form:  
<http://iuca.unizar.es/science-and-past-registration>

REGISTRATION PERIOD	DATE	SENIOR REGISTRATION FEE	STUDENT REGISTRATION FEE
Early registration	January 20, 2017	200 €	110 €
Late registration	from January 21, 2017	275 €	180 €

### Registration fees include:

- Attendance to course sessions
- Program and course documentation
- Certificate of attendance
- Coffee breaks

### PAYMENT:

Payment (in euro) should be made by bank transfer to:

Bank: Ibercaja  
IBAN: ES 82 2085 0111 79 0330788546  
Swift code: CAZRES2Z

Please, include clearly your name in the bank transfer boucher

### CONFIRMATION OF REGISTRATION:

Your registration will be confirmed when the payment of the registration fee is received (please, send copy of the bank transfer to [iuca@unizar.es](mailto:iuca@unizar.es))

### FINANCIAL SUPPORT:

Financial support will be given for a limited number of participants to cover travel expenses in full or partly. Application deadline January 16th 2017.

### COURSE COORDINATOR:

Dr. Josefina Pérez-Arantegui  
(IUCA, University of Zaragoza)

### FURTHER INFORMATION:

Environmental Sciences Institute (IUCA),  
University of Zaragoza (Spain)  
c/ Pedro Cerbuna, 12. 50009 Zaragoza  
Email: [iuca@unizar.es](mailto:iuca@unizar.es)  
<http://iuca.unizar.es> Twitter: @IUCAunizar

# SCIENCE & PAST

## Mastering Materials

to know our  
Heritage



### ATTENDEES PROFILE

Students, researchers and professionals in **chemistry, physics, geology, biology, archaeology, conservation science, palaeontology...** to acquire a solid knowledge on natural and material sciences applied to the study, safeguarding, conservation and authentication of material heritage

**VENUE:** Biblioteca María Moliner  
Campus San Francisco, University of Zaragoza

### ORGANIZATION

**Environmental Sciences Institute – IUCA**  
(University of Zaragoza)  
Facultad de Ciencias. C/ Pedro Cerbuna, 12

50009 Zaragoza – Spain  
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**FEBRUARY 1-3, 2017**

**University of Zaragoza**  
(SPAIN)

**8th Interdisciplinary Course**

### REGISTRATION

<http://iuca.unizar.es>

Deadline for early registration:  
**JANUARY 20, 2017**

Deadline for financial support  
applications:  
**JANUARY 16, 2017**



Facultad de  
Filosofía y Letras  
Universidad Zaragoza



Instituto Universitario de Investigación  
en Ciencias Ambientales  
de Aragón  
Universidad Zaragoza



Universidad  
Zaragoza

# MASTERING MATERIALS TO KNOW OUR HERITAGE

## 8th INTERDISCIPLINARY COURSE

The course is focused on the development and use of scientific techniques in order to extract archaeological, historical and conservation information from the cultural heritage. In this edition, special focus will be given on understand materials through an in-depth scientific approach.

The lectures are addressed to students in chemistry, physics, geology, biology, archaeology, conservation science, palaeontology, etc., to acquire a solid knowledge on natural and material sciences applied to the study, safeguarding, conservation and authentication of material heritage.

### Wednesday, 1<sup>st</sup> February

09:00. Registration

09:25. Presentation

09:30. X-ray synchrotron microtomography helps to reveal the past: Part I, Principles

**Vincent Beyrand.** European Synchrotron Radiation Facility (France)

10:30 Coffee break

11:00 X-ray synchrotron microtomography helps to reveal the past: Part II, Applications

**Vincent Beyrand.** European Synchrotron Radiation Facility (France)

12:00 Studying ancient ceramics: from the supply of raw materials to the laboratory

**Elisabetta Gliozzo.** Università degli Studi di Siena (Italy)

13:30. Discussion

*Lunch*

15:30. Production technology and trade routes of ancient glass materials

**Elisabetta Gliozzo.** Università degli Studi di Siena (Italy)

17:00. Discussion

# PROGRAM

### Thursday, 2<sup>nd</sup> February

9:30 Research and applications of nanomaterials in Cultural Heritage

**Silvestro A. Ruffolo** (Università della Calabria, Italy)

11:00. Coffee break

11:30. Organic residues analysis in archaeology: focus on chromatography and mass spectrometry

**Erika Ribechini.** Università di Pisa (Italy)

13:30. Discussion

*Lunch*

15:30. The materials of modern and contemporary art

**Francesca Modugno.** Università di Pisa (Italy)

17:30. Discussion

### Friday, 3<sup>rd</sup> February

9:30. Archaeometallurgy: questions and methods

**Marcos Martín-Torres.** University College of London (United Kingdom)

10:30. Coffee break

11:00. Archaeometallurgy case studies: America and China

**Marcos Martín-Torres.** University College of London (United Kingdom)

13:00. Discussion and concluding remarks