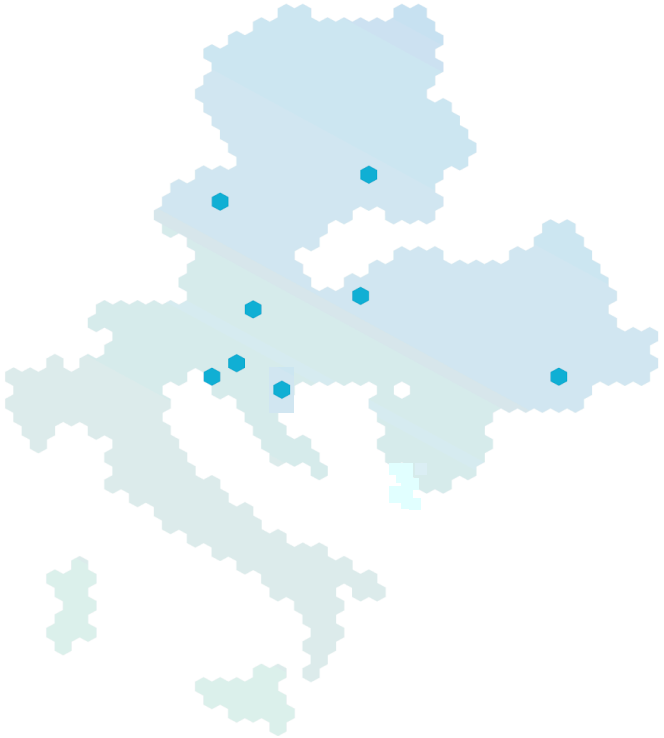
CERIC

Central European
Research Infrastructure
Consortium

CERIC-ERIC

Central European infrastructure for Research in Materials and Life Science

CERIC-ERIC in brief

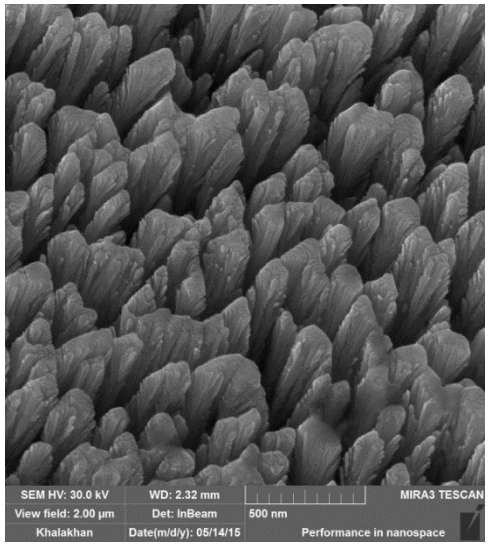


CERIC is a **multi-site open access** research infrastructure

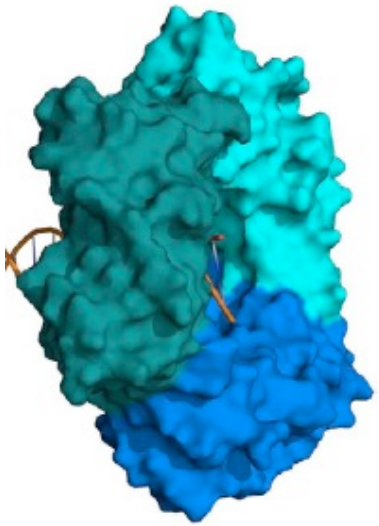
CERIC has facilities in 8 countries in **Central and Eastern Europe**

CERIC offers access to **nearly 50 instruments** via a for multidisciplinary research in all fields of **advanced materials, biomaterials and nanotechnology**

CERIC-ERIC: Scientific case



a new catalyst

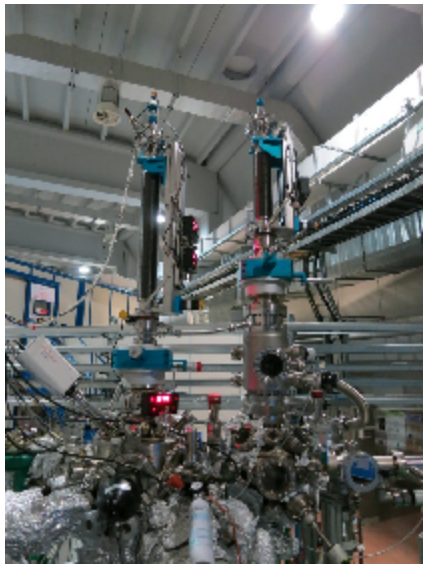


a new enzyme structure

Lykhach, Y., et al. *Catal.Sci Technol,* **2017**, 7, 4315

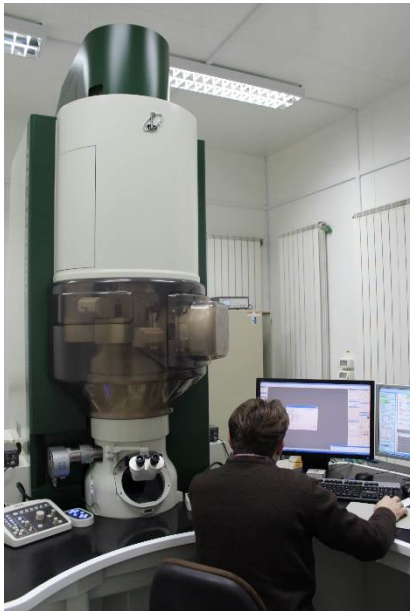
De March, M. et al. *Nat Comms,* **2017**, 8, 13953

For characterisation you need:



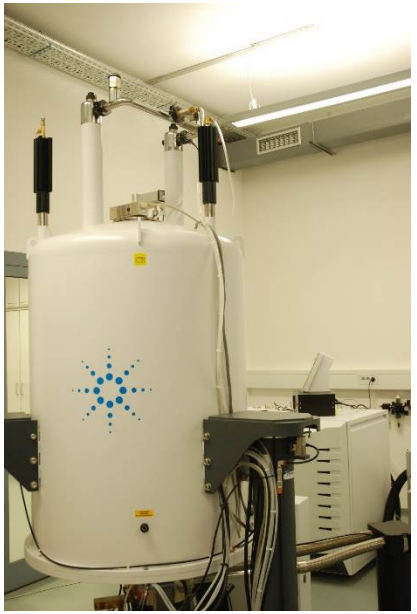
ESCA

HR-TEM



SANS

NMR



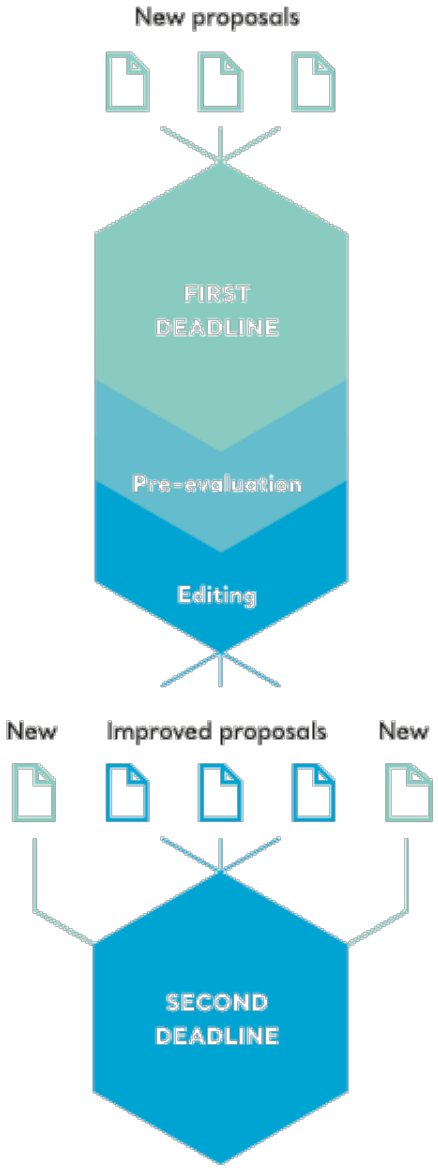
Open Access to multiple facilities: the traditional way

BNC	Elettra	SloNMR
Deadline May	Deadline March	No open access
Review Panel	Review Panel	Collaborators
Access procedures	Access procedures	Access procedures
Report	Report	Report
www.bnc.hu	www.elettra.eu	www.slonmr.si

Our way (our services)

- Possibility to ask for **several instruments** in a single proposal;
- **Free and open access** upon selection by an independent panel of international experts
- **Two-steps** submission;
- Access to **support laboratories;**
- Continuous **fast track access** to selected instruments;
- Dedicated scientific support with **promotional access;**
- **Mobility support** for two users**, dissemination.**

2-step submission



To have a pre-evaluation and the possibility of improving your proposal

Applications solely for the 2nd deadline are recommended only for expert users

Fast track access

Available on selected instruments for feasibility studies and very short measurements. Proposals should:

- Show a multi technique approach or
- prove the need to test a new sample, new instrument or
- be necessary to validate results for an imminent publication.

For fast track access, discussion with the beamline scientist is mandatory!

ACCELERATE has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N. 731112

Fast track access

Continuous submission through the VUO.

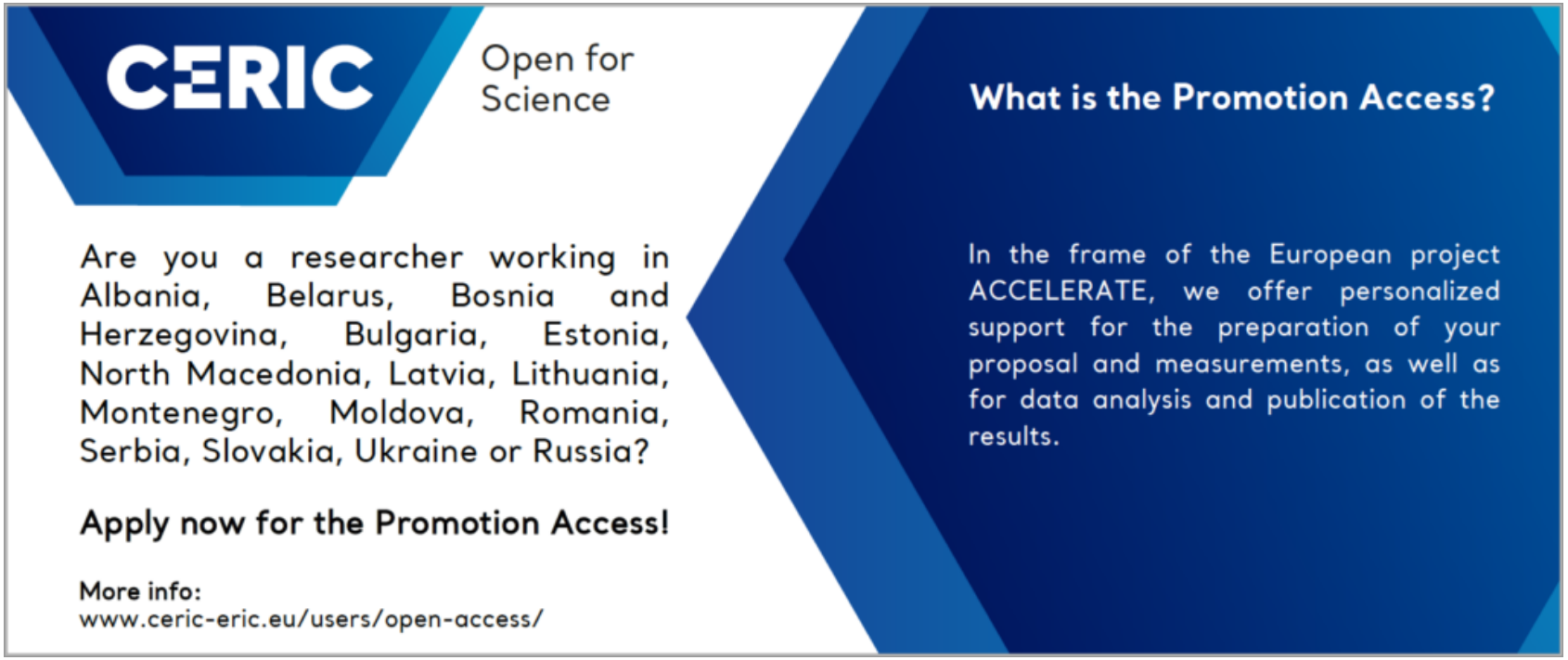
Evaluation by the local contact within **7 days** after submission.

Scheduling within **1 month** after evaluation.

Max. 48hrs of measurement time. Mobility support for 2 users.

Report and proposal for regular call.

Promotional access



- 2 weeks to 1 month of professional support fully dedicated;
- Support for up to 3 participants, through the European project ACCELERATE (www.ACCELERATE2020.eu)

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The Partner Facilities

Austria

X-ray Scattering
TU Graz and
Elettra

Croatia

Ion Beam
Analysis and
modification
Ruđer-Bošković
Institute

Czech Republic

Surface science
Charles University
and Elettra

Romania

HRTEM and
EPR
National
Institute for
Material
Physics

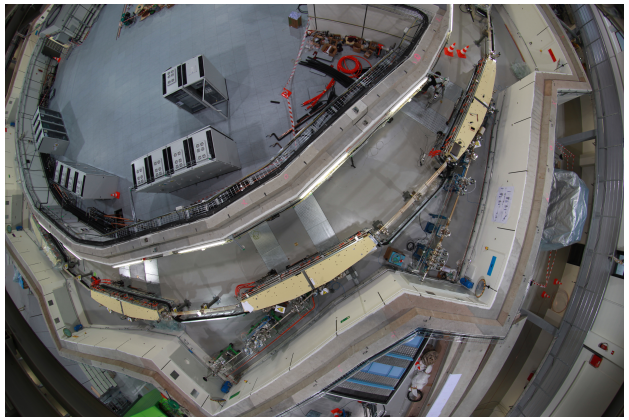
The Partner Facilities

Hungary

Budapest Neutron Centre

Poland

Synchrotron Radiation at SOLARIS and Cryo-EM



Italy

Synchrotron Radiation Elettra

Slovenia

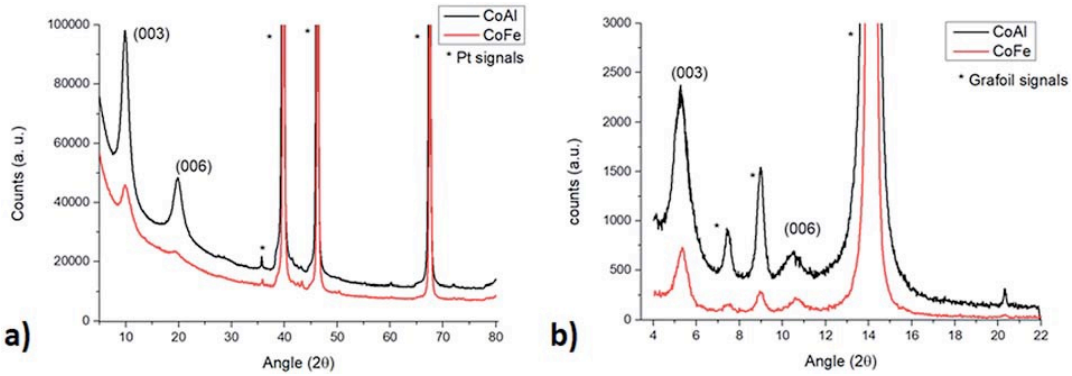
SloNMR Centre, National Institute of Chemistry

Energy: fuel cells

Layered Double Hydroxides (LDHs) for energy storage, sensing, and electrocatalysis

Thin films of CoAl or CoFe LDHs on graphitic supports resulted in better stability and reproducibility, thus enabling future applications of noble metal-free, low cost and eco-compatible electrocatalysts and sensors

MCX, XAFS, HRTEM



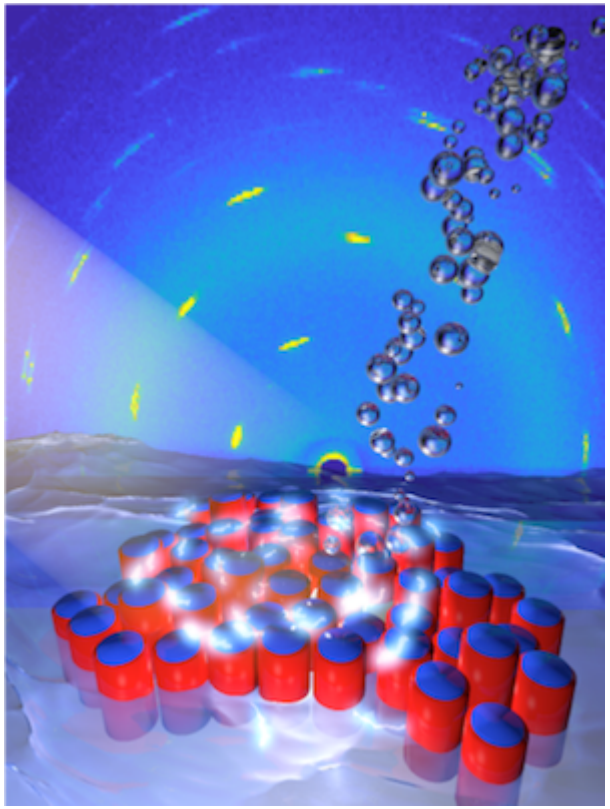
Musella, Elisa, et al. "Newly developed electrochemical synthesis of Co-based layered double hydroxides: toward noble metal-free electro-catalysis." ***Journal of Materials Chemistry A*** 7.18 (2019): 11241-11249.

Energy: artificial photosynthesis

Artificial photosynthesis for energy applications.

A new combination of an artificial light-harvesting antenna and a metallic catalyzer is capable of self-assembling in water, resulting in a high efficiency structure that mimics the natural PSII, able to split water using visible light.

SAXS, XRD



Model representation of a quantasome

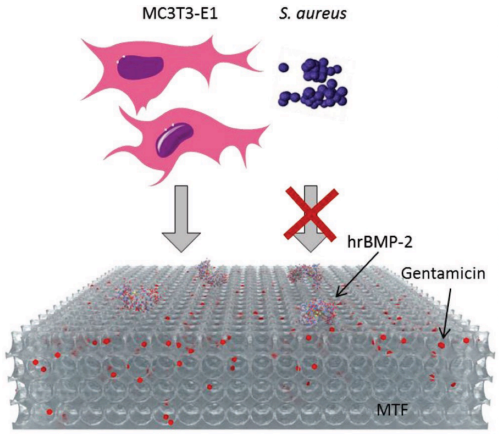
Bonchio, Marcella, et al. "Hierarchical organization of perylene bisimides and polyoxometalates for photo-assisted water oxidation." ***Nature chemistry*** 11.2 (2019): 146.

Health: bone implants

A titania mesoporous film (MTF) modified with a bone growth factor and embedded with antibiotics for promoting tissue recovery while reducing infection risk.

This technology will lead to better and safer recovery after major fractures or bone amputations.

SAXS



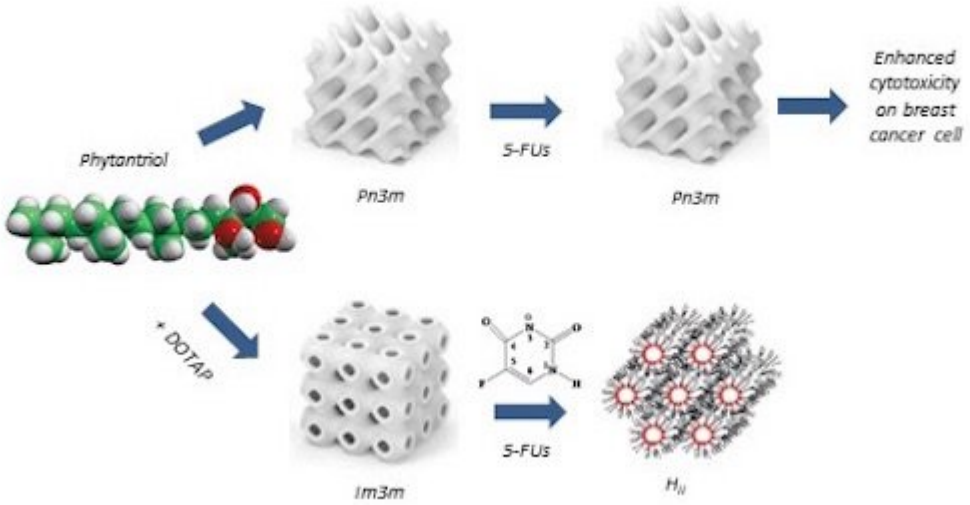
Escobar, Ane, et al. "Antibacterial Mesoporous Titania Films with Embedded Gentamicin and Surface Modified with Bone Morphogenetic Protein 2 to Promote Osseointegration in Bone Implants." ***Advanced Materials Interfaces*** 6.9 (2019): 1801648.

Health: drug delivery

Nanotechnology for medical applications.

Drug delivery can improve chemotherapics' effectivity while reducing their side effects. Phytantriol, a commonly used molecule in cosmetics, has been used as a carrier for the chemotherapic 5-FU, resulting in improved effectivity.

SAXS, DLS, FT-IR and UV resonant raman



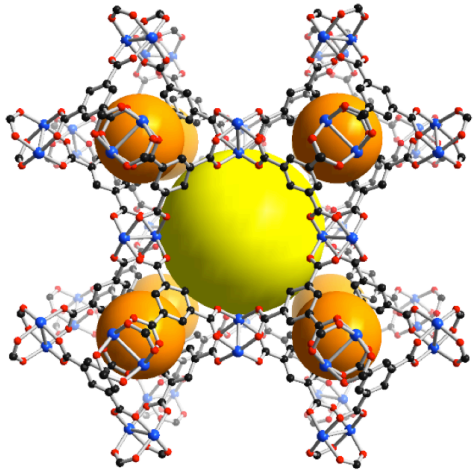
Astolfi, Paola, et al. "Lyotropic liquid-crystalline nanosystems as drug delivery agents for 5-fluorouracil: structure and cytotoxicity." ***Langmuir*** 33.43 (2017): 12369-12378.

Materials: Metal-Organic Frameworks

Metal-Organic Frameworks (MOFs) have impactful applications in semiconductors and space industry for gas storage and filtration.

Our users demonstrated a new route for the production of MOFs starting from copper carbonate, allowing low costs and environmental impact.

SAXS



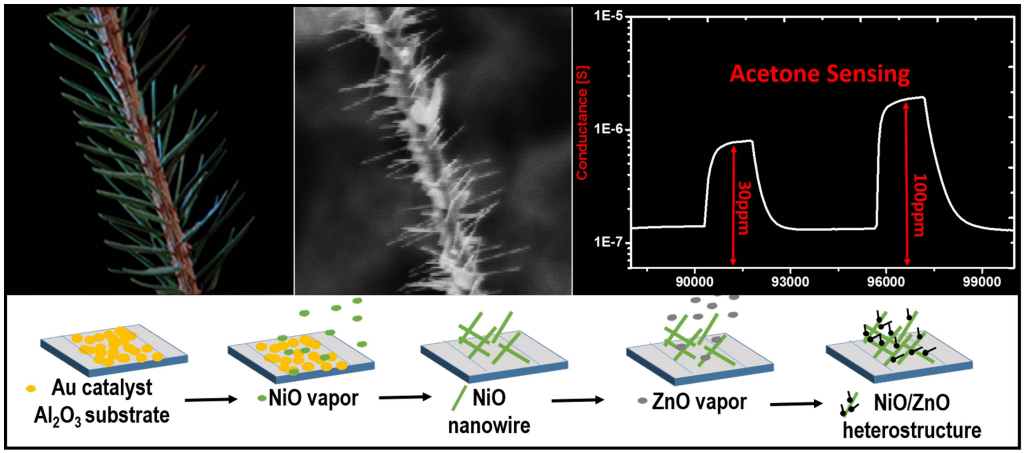
Riccò, Raffaele, et al. "Conversion of Copper Carbonate into a Metal–Organic Framework." ***Chemistry of Materials*** 30.16 (2018): 5630-5638.

Materials: carbon lithography

Manufacture of nanowire-based heterostructures for the production of gas sensing devices with improved sensitivity.

This application will have an impact on the detection of hazardous gases like the Volatile Organic Compounds (VOC), like acetone, benzene, and formaldehyde.

HR-TEM



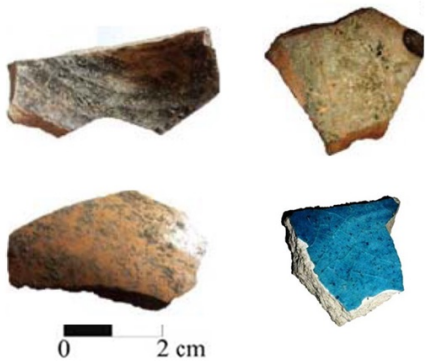
Kaur, Navpreet, et al. "Branch-like NiO/ZnO heterostructures for VOC sensing." ***Sensors and Actuators B: Chemical*** 262 (2018): 477-485.

Cultural heritage: ceramic potteries

Multitechnique analysis for unveiling information hidden in the deep details of our cultural heritage.

An example is tracking the origin, and the firing temperature, of ancient potteries from the town of Agsu, in Azerbaijan.

RBS, Ion Microbeam, PIXE, PGAA, FT-IR, UV Raman, SEM



Torrisi, Lorenzo, et al. "RBS, PIXE, Ion-Microbeam and SR-FTIR Analyses of Pottery Fragments from Azerbaijan." ***Heritage*** 2.3 (2019): 1852-1873.

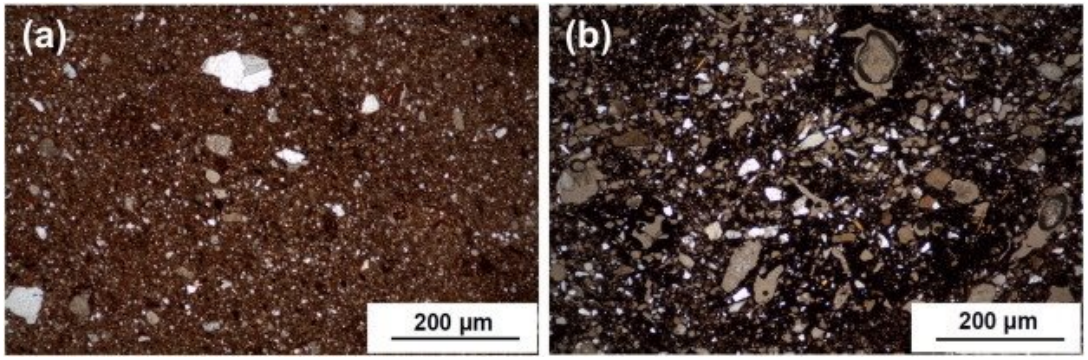
Crupi, Vincenza, et al. "EVALUATION OF COMPLEMENTARY METHODOLOGIES APPLIED TO A PRELIMINARY ARCHAEOMETRIC STUDY OF GLAZED POTTERY FROM AGSU (AZERBAIJAN)." ***International Journal of Conservation Science*** (2016).

Cultural heritage: restoration

A widely accepted approach in cultural heritage restoration is to use the best compatible materials.

Finding the firing temperature of clay bricks is crucial for producing suitable replacing materials.

MCX, SANS



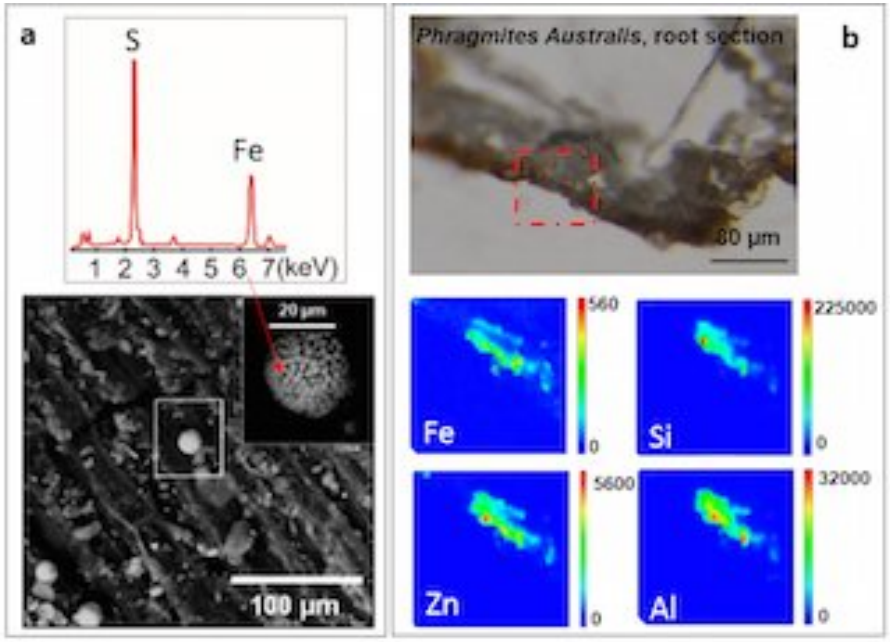
Viani, Alberto, et al. "Assessment of firing conditions in old fired-clay bricks: The contribution of X-ray powder diffraction with the Rietveld method and small angle neutron scattering." ***Materials Characterization*** 116 (2016): 33-43.

Environment: bioremediation

Synchrotron techniques allow to investigate the bioaccumulation of Zn and Fe in the roots of Phragmites australis

Understanding the interactions between geosphere and biosphere revealed useful insights for rescuing polluted environments.

TWINMIC, XAFS



De Giudici, Giovanni, et al. "The role of natural biogeochemical barriers in limiting metal loading to a stream affected by mine drainage." ***Applied geochemistry*** 76 (2017): 124-135.

Access to CERIC-ERIC infrastructures: hints

The proposal must be scientifically compelling and competitive

- Build a **strong scientific case** how your experiment could give a result which allows a **significant advance** in a specific field.

- Write a **highly targeted proposal** that responds to a clear scientific problem. Try to avoid to broad or blurry aims and goals

Access to CERIC-ERIC infrastructures: hints

- **Consult the instrument/beamline scientist**
  - Target the measurements to the instruments you need.
  - Clearly identify how your experiment can be done and whether it can give you the results you need.
  - Get advice on the number of shifts needed.

- **The reviewers have a lot of proposals to read!**
  - The proposal has to be self-contained.
  - All important information must be given in the proposal.
  - Technically poorly written proposals (typos, errors, not respecting the format) might get a bad mark.
  - Structure is important! Write clear and easy to read.

Where to find us

Website:
www.ceric-eric.eu

LinkedIn:
www.linkedin.com/company/ceric-eric

Twitter:
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CERIC

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Consortium

Thank you!

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