

CERIC-ERIC

<https://www.ceric-eric.eu/>

About CERIC-ERIC

The Central European Research Infrastructure Consortium, CERIC-ERIC, is a distributed Research Infrastructure, with one single entry point to nearly 50 complementary instruments and techniques for multidisciplinary research in all fields of **advanced materials, biomaterials and nanotechnology.**



- One facility per country
- **No transfer of money**, but transfer and share of values
- **Access to commercial users** under market-based conditions



CERIC operation is supported by:

- A financial contribution of the hosting country, Italy
- **In-kind contributions** by the other Members

STRUCTURE:
Participating Country (member)
Representing Entity
Partner Facilities

The Partner Facilities



※ **Austria**

Scattering
TU Graz and
Elettra



※ **Croatia**

Ion Beam
Ruđer-
Bošković
Institute



※ **Czech
Republic**

Surface analysis
Charles
University
Prague and
Elettra



※ **Hungary**

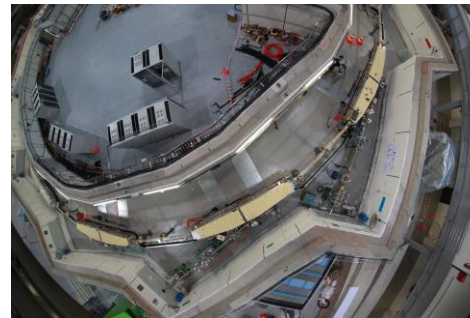
Budapest
Neutron
Centre

The Partner Facilities



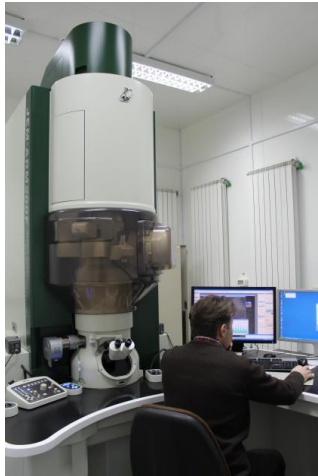
※ **Italy**

Elettra
Sincrotron
e Trieste



※ **Poland**

Synchrotron
Solaris



※ **Romania**

TEM and EPR
National
Institute for
Material
Physics



※ **Slovenia**

NMR Centre
of the National
Institute
For Chemistry

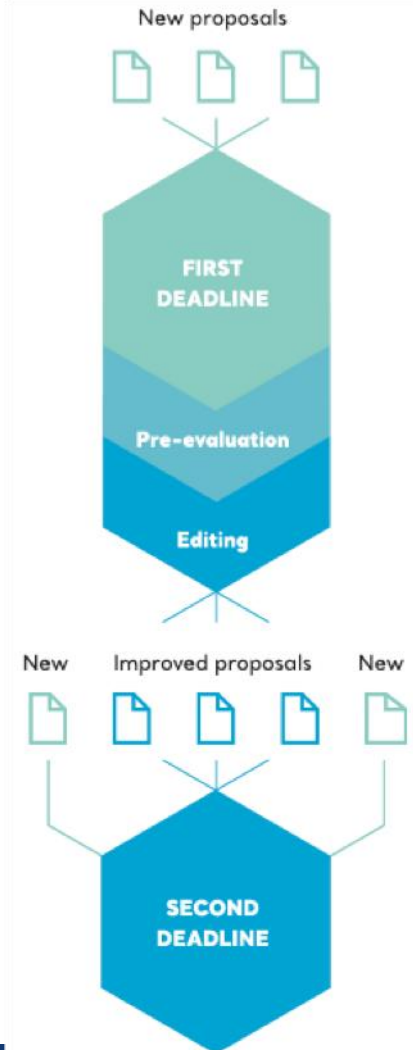
Open Access

- **Single entry point** to nearly 50 techniques;
- Possibility to ask for **several instruments** in a single proposal;
- **Free and open access** to select the best single or multi-technique proposals through **external peer evaluation**;
- Access to **support laboratories**;
- **Mobility support** for 2 users per measurement;
- **Support** in proposals preparation;
- **Awards** to the best publications;
- Dissemination of research impact to the community.

Open Access (2 calls per year)



2-step access procedure

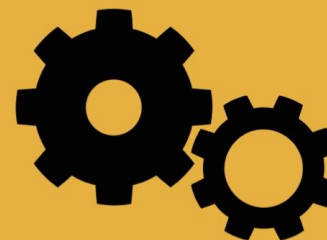


Commercial Access

CERIC collaborates with industry, contributing to science-driven innovation.

Services for commercial users are offered under market-based conditions and include:

- ※ **Research and Development (R&D)**, through:
 - **Access to instrumentation**
 - **Contract research**
 - **Joint application for projects**
- ※ Training
- ※ Innovations' marketplace
- ※ Spin-off and start-up support



Fields of application:
chemical, medicine and diagnostics, optics, electronics and informatics, micro- and nano-technologies and high-tech materials, environment, energy, food and cultural heritage

Services

➤ **Access to instrumentation.**

- ***Specific measurement/s***, when for is clear which kind of instrument and measurement is needed.

OR

- As ***outsourced proprietary research*** when the Third Party will present a request and it needs to be analysed and find the best technique or techniques to accomplish with the request.

- **Contract Research** advanced development research on topics of interest for industry to develop innovative solutions.

- **Joint Application for Projects.** building consortium for financed project, help to find the proper partners and support for specific financing instruments.

- **Other services** could also be offered such as trainings on state of the art techniques and how to make a profit with them for industrial applications.

Some Sectors

※ ENERGY

*Studies are being carried out including the development **novel materials with advanced properties to be applied on solar and fuel cells and batteries** and CERIC can offer solutions for main topics related to materials applied to the newest systems.*

※ METAL/METALLURGY

*Build on current **micro and nano-manufacturing capabilities related to metals and developing intelligent multi-functional surface properties** for metal components and solutions is key for metal industry. CERIC can support the study of these properties and define new grades of metals and alloys with higher strength, formability and corrosion resistance.*

※ OPTOELECTRONICS

*Enhanced **conductive and magnetic properties of materials and miniaturisation** are the areas where the industry is focusing its efforts in order to come up with better innovations and inventions. CERIC Partner facilities can offer an extensive knowledge and a wide range of solutions for materials development in this area.*

※ AUTOMOTIVE AND AEROSPACE

*Supporting aerospace and automotive industry on advanced materials and devices to **meet critical safety and performance requirements, assessing the capabilities and limitations of materials even in extreme conditions.***

Some Sectors

※ CHEMICAL

Controlling structures at the micro- and nano-levels is essential to develop new products, meanwhile Almost all chemical industries nowadays rely on development, selection, and application of catalysts. CERIC Partners facilities can offer their expertise on this "hot topics" for Chemical industry.

※ PHARMACEUTICAL, MEDICAL AND BIOTECH

*Obtaining much more precise information of the **molecular structure and behaviour** offering the possibility to understand unsolved issues so far. Among others, CERIC Partner facilities help to understand **variability in drugs and their behaviour**, critical to address the problem of failing to identify effective drug, or to study biosimilars.*

※ CULTURAL HERITAGE

*Offering a wide complementary set of characterisation techniques, essential due to the complexity and heterogeneity of the samples, through **low or non-destructive analytical methods and providing information from atomic to the structural level of the samples.***

※ ENVIRONMENTAL

*Every aspect of materials usage, from extraction to production, and disposal is now related to environmental considerations. CERIC Partner facilities also collaborates on **systems and processes for analysis, monitoring and control of contaminant particles, nanoparticles and trace elements** too.*

Example of techniques on residual stress

Materials characterisation by x-ray diffraction Beamline (MCX) at Elettra

- Studying materials surfaces at atomic level.
- Offering very sensitive analysis of materials microstructure and its thermal behaviour through residual stress test for, among others, metallurgy, construction, aeronautics, aerospace, cultural heritage and environmental related issues too
- Powders structures can be well studied too, along with distribution and size of nanoparticles

Example of techniques on residual stress

**The M(aterial) TEST
neutron diffractometer
at Budapest Neutron
Center**

- Bulk-phase information in contrast to laboratory x-ray diffraction techniques as penetration depth is higher. Applied to define the stress field experienced by the material.
- It covers the range of medium-resolution powder, liquid and amorphous total diffraction
- It sees light elements in the presence of heavy ones.
- Among other sectors the technique can be applied to stresses studies for automotive, aerospace, metallurgy sectors
- Chemical and petrochemical industry to understand the diffusion behaviour of molecules in microporous materials for the design of membranes for separations and for catalysts.

Thank you

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