CERIC

Central European
Research Infrastructure
Consortium

Report

2025

ERIC established by the European
Commision Implementing Decision
392/2014/EU

Open for Science

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Providing Open Access to Excellent Researchers

The Central European Research Infrastructure Consortium, CERIC-ERIC (in the following, CERIC, or the Consortium), is an integrated multidisciplinary research infrastructure for basic and applied research in materials and biomaterials sciences and nanotechnology.
It operates through a Partner Facility in each of its 8 Member Countries (Austria, Croatia, Czech Republic, Hungary, Italy, Poland, Romania and Slovenia) which contribute through these facilities. CERIC allows open access to the best researchers from all over the world through a single-entry point and international evaluation of the proposed research.
The Partner Facilities (PFs), which are periodically evaluated by the International Scientific and Technical Advisory Committee (ISTAC), are strongly complementary to each other. They allow the integrated use of analytical and synthesis techniques based on different microscopic probes for nano-level science and technology. Available methods include the use of photons, electrons, ions and neutrons in X-ray spectroscopy, diffraction and imaging, light scattering, ion beam analysis, high-resolution electron microscopy and neutron scattering.

Andrew Harrison
CERIC Executive Director

Dear Colleagues, Partners and Friends,

2025 marks the start of a new decade for CERIC, building on the first ten years of growing research capabilities and achievements with an ambition to further strengthen the European research landscape with a particular focus on Central European countries.

This ambition has been strongly supported by the Ministries of our eight Member states, primarily through the provision of open-access to some of their leading research facilities. Looking forward, we are glad to report that the same Members are also supporting very significant development of those Facilities. For example, 2025 saw the start of the main physical work of the ELETTRA 2.0 storage ring upgrade, complemented by substantial enhancements of the Austrian and Czech Partner Facility beamlines there, while the upgrade of the Croatian Partner Facility made great progress too. Further details of these and indeed developments at all Partner Facilities can be found in these pages.

This Annual Report also highlights the outstanding and diverse science enabled by CERIC, much of which takes advantage of one of our defining strengths: the ability to provide access to multiple complementary techniques through a single proposal. This unique model allows researchers to address increasingly complex scientific challenges in a highly effective and efficient manner. Our supported access processes also play a crucial role in boosting the delivery of high-impact science in countries and research communities with limited prior experience of large-scale user facilities, helping to broaden participation and build scientific capacity across Europe.

The majority of this work to date has been in the field of materials science so in 2025 we started to develop a strategy to enhance and exploit our capabilities in areas of the life sciences, identifying the science of aging as an area in which CERIC may have particular opportunities to make an impact.

CERIC is also playing an important role in the co-ordination, collaboration in or the delivery of a range of projects at national and the wider European level where we bring particular insights in addressing the challenges of the ‘widening’ agenda and for which we have become a sought-after partner in successful pan-European projects.

I would like thank warmly everyone who contributes to the success of CERIC-ERIC—our staff, facility teams, users, and stakeholders, across borders and disciplines, You make CERIC-ERIC the vibrant and impactful organisation it is today.

Dr. Andrew Harrison
Executive Director

2025 Key Achievements

Promoting Scientific Excellence

- Implementation of two Calls for free open access to which 247 proposals, for a total number of 326 instrument requests, were received. Proposals were submitted from 36 countries.
- Continuous fast-track access for feasibility studies and commissioning, and possibility to perform experiments via remote access.
- Positive evaluation of the Italian, Austrian and Slovenian Partner Facilities.
- Participation in externally funded projects: IMPRESS, ReMade@ARI, ERA-Shuttle, OPVStability, ERIC Forum 2, OSCARS, ACTNXT.

Developing and strengthening CERIC's portfolio

- Infrastructure upgrade: New accelerators under construction at the Austrian, Croatian and Italian PFs; secured funding for the CUBES beamline at the Czech PF; equipment upgrade at the Polish, Romanian and Slovenian PFs, and at the JRC AF.
- New instruments added to the CERIC open access offer: TomoLab-offline, TeraFermi online and offline (Italian PF), Microfabrication Laboratory (Austrian PF), 600 MHz NMR spectrometer (Slovenian PF).
- Five projects funded via the CERIC Call for Expression of Interest started in 2025.

Upskilling staff at CERIC and beyond

- ~250 hours of training delivered to CERIC staff
- 60+ scientists gathered together for a symposium on Life Sciences
- 45 high-school pupils trained during the PaGES 9 project.
- 13 CERIC-supported PhD projects completed.
- 450+ people engaged via science dissemination events: Trieste Next and Genoa Science Festival.

Cultivating Innovation and Industry Coopertaion

- Promotion of the CERIC services for the industry at major events: EIC webinar, FEM Euromat, EU Hydrogen Week.
- New ongoing negotiations with two EIC Beneficiaries operating in the fuel cells and nanomaterials domains, feasibility tests carried out for a third Beneficiary on PFAS domain.
- Collaboration with a venture capital firm.
- 6% of the articles from open access research was related to industry.

Advancing the European Research Infrastructure ecosystem

- Strengthened CERIC's position as a key reference for the ERIC community by advancing work on a European employment contract and contributing to the identification of challenges and recommendations inherent to the ERIC Regulation.
- Fostering staff and researcher mobility within CERIC's headquarters and its Partner and Associated Facilities.

Operations and Finance

- CERIC's Internal Regulations updated.
- New ISTAC Chair and Deputy Chair.
- Development of the CERIC's Proposal Management System continued in 2025.
- Financial and in-kind annual account.

Executive Summary

Throughout 2025, CERIC strengthened its position across its key strategic pillars, including scientific excellence, innovation, industrial collaboration, and European policies support. The level of demand for open access remained stable (Table 1), and Consortium continued to grow through the addition of new experimental techniques.

Headline Indicators	2022	2023	2024	2025	% Change 2025-2024
Proposals received	343	333	317	247	-22%[1]
Number of papers	120	109	129	129	/
Share of papers among 10% top cited[2]	9,9%	12,2%	12,7%	14,9%	+17,3%

Table 1 Headline indicators for 2022-2025 and changes in the last reported year.

Promoting Scientific Excellence

In 2025, CERIC continued to offer open access to over 60 analytical techniques distributed across its Partner and Associated Facilities (PFs/Afs). During the year, two Calls for Proposals attracted 247 submissions, corresponding to 326 single-instrument requests. Due to limited operations at the Croatian and Italian Partner Facilities, including a shutdown at the Italian synchrotron for a major upgrade to a fourth-generation facility, applications decreased by 22% compared to the previous year. Nevertheless, 152 proposals (204 single-instrument requests) were approved, accounting for nearly 17.000 experimental hours. Fast Track Access continued throughout the year, enabling rapid access to selected instruments within one month. This scheme received 56 proposals, a 70% increase over 2024.

The Consortium maintained a strong international profile, attracting principal investigators from 36 countries, while researchers from Member Countries accounted for 62% of submissions. Gender balance also remained a priority, with women representing 44% of principal investigators and 40% of facility users.

Research output remained strong, with 129 publications generated during 2025. Although the average Impact Factor decreased slightly to 7,06, citation performance improved, with a higher share of papers among the most cited in their fields. CERIC also strengthened its international engagement through several European projects, including the launch of ACTNXT, and continued participation in Horizon Europe and Marie Skłodowska-Curie initiatives.

Developing and strengthening CERIC's portfolio

Supported by annual contributions from the Italian Ministry for University and Research and, since 2024, by a revised membership-fee funding model, also in 2025 CERIC has strengthened infrastructure, expanded access to advanced instruments, and recruited scientific and technical staff across its Facilities.

Main results in 2025 included the construction of new accelerators in Croatia and Italy, funding secured for the CUBES beamline in the Czech PF, and equipment upgrades in Poland, Romania, Slovenia, and the JRC Associated Facility. New instruments added to the open-access portfolio included TomoLab, TeraFermi, the Austrian Microfabrication Laboratory, and a 600 MHz NMR spectrometer in Slovenia.

A major initiative was the Expression of Interest (EoI) programme, supporting collaborative, high-impact projects across Member Countries. In 2025, the CH-ERIC project on Cultural Heritage research was completed, enhancing multidisciplinary analysis through collaboration among Croatian, Hungarian, Italian, and Slovenian PFs. Five new EoI projects were launched: BatERIC (battery research), HF-SAXS 2.0 (beamline upgrade), PathChip@CERIC (host–pathogen interaction studies), FAITH (advanced imaging and tomography), and AEMWE (electrocatalyst research). These projects combine infrastructure development with specialised human-resource recruitment, reinforcing CERIC's scientific capabilities and supporting strategic research areas such as energy, health, materials science, and cultural heritage.

Upskilling staff at CERIC and beyond

In 2025, CERIC strengthened its commitment to education, training, and public engagement across all levels of the research community. Staff development remained a priority, with nearly 250 hours of training delivered on topics ranging from software development and scientific evaluation to GDPR, risk management, HR, technology transfer, and communication. CERIC also advanced scientific networking through a Life Sciences symposium in Warsaw, bringing together over 60 researchers to discuss aging-related challenges in structural biology, neurodegeneration, and musculoskeletal disorders, while highlighting the growing importance of AI and support laboratories in modern research.

Science communication and outreach were further reinforced through the PaGES 9 project, which involved 45 high-school students from four schools, increasing their interest in STEM subjects and research careers. Support for early-career researchers also continued through CERIC's PhD scholarship programme, which contributed to scientific publications, conference participation, and award-winning research presentations.

Public engagement remained a central focus: CERIC participated in major science events such as the Genoa Science Festival and Trieste Next, organising conferences on cultural heritage, research infrastructures, and technology transfer. These activities engaged hundreds of participants, promoted scientific literacy, and strengthened connections between research, education, industry, and society.

Cultivating Innovation and Industry Cooperation

In 2025, CERIC strengthened its contribution to the European innovation ecosystem by expanding collaborations with industry, investors, and innovation networks. Through engagement with the European Innovation Council (EIC), the Consortium promoted the role of research infrastructures in innovation and initiated collaborations with EIC-funded companies in areas such as fuel cells, nanomaterials, and PFAS detection. Through the ReMade@ARI project, three companies accessed CERIC Romanian, and Polish PFs.

CERIC also enhanced its integration within innovation networks by signing a framework agreement with an Italian venture capital firm to provide scientific support to technology-based start-ups and by exploring membership in the DeepTech Alliance, which connects start-ups, corporations, investors, and research organisations across Europe.

Moreover, to promote its services to industrial users, CERIC participated in key research-to-business events, including FEM Euromat, EU Hydrogen Week, and CPHI 2025.

These efforts generated measurable results: in 2025, industry-related projects represented 6% of users accesses, while 6% of scientific publications involved company-affiliated authors or originated from industry-linked research activities, demonstrating CERIC's growing impact on innovation and technology transfer.

Advancing the European Research Infrastructure ecosystem

In 2025, CERIC led a major ERIC Forum initiative aimed at developing a common European employment framework for researchers and support staff. The work began with the publication of a report analysing employment regulations and practices across European Research Infrastructures and international organizations. Building on this analysis, the project explored key issues such as unified employment contracts, standardised job titles, staff classification, competence frameworks, and career development pathways. To advance these goals, ERIC Forum organised workshops involving the European Commission and experts from policy, legal, and operational fields. Discussions focused on creating a strategic roadmap toward a European employment contract for ERICs. The group also adopted the European Commission's RMComp competence framework to define skills and job families. A second workshop with major research infrastructures, including CERN, EMBL, ESA, and several ERICs, examined workforce development, skills assessment, and staff grading systems.

Operations and Finance

In 2025, CERIC continued strengthening its governance and operational framework through updates to its Internal Regulations (IRs), which translate the Consortium's strategic objectives into practical procedures. The General Assembly approved revisions concerning the roles of Representing Entities, PFs and AFs, including the introduction of Membership Fees. The International Scientific and Technical Advisory Committee (ISTAC) also underwent leadership changes: Annalisa Pastore of King's College London was elected Chair, while Robert McGreevy of STFC Rutherford Appleton Laboratory became Deputy Chair, bringing expertise in structural biology and neutron scattering respectively.

Meanwhile, development of the Proposal Management System (PMS) progressed significantly. The web-based platform, which supports the entire user application process for accessing CERIC Facilities, released a Beta version in December 2025 with enhanced functionality.

The final section of this report provides a comprehensive overview of the financial and economic status of the Consortium for the year 2025. This overview is presented in accordance with the International Public Sector Accounting Standards (IPSAS) under the accrual basis of accounting. This financial reporting ensures transparency and provides a clear picture of CERIC's financial health to stakeholders and members alike.

[1] Croatian and Italian Partner Facilities had limited operations in 2025. For full explanation see Chapter 1.

[2] Percentage of publications based on research performed using facilities/resources of the RI that, compared with the publications in the same field and in the same year, belong to the top 10% most frequently cited.

About CERIC

CERIC* has established and has been operating a multidisciplinary distributed RI on a non-economic basis.

Mission

CERIC is a research infrastructure integrating and providing open access to some of the best facilities in Europe, to help science and industry advance in all fields of materials, biomaterials and nanotechnology. It enables the delivery of innovative solutions to societal challenges in the fields of energy, health, food, cultural heritage and more.

Vision

CERIC co-creates the European Research Area (ERA) by enabling the best global researchers to realize their ideas in a multicultural research environment with a worldwide reach. By expanding insight into materials on the nanoscale, CERIC contributes to solving contemporary societal challenges.

*in line with the ERIC Regulation (EC No 723/2009)

CERIC integrates leading national research institutes into a unique international infrastructure, having its statutory seat in Trieste – Italy, and its nodes distributed across its Member Countries - Austria, Croatia, Czech Republic, Hungary, Poland, Romania and Slovenia (Serbia is currently pending full membership).

Each Member Country contributes in kind to CERIC by making available and supporting a Partner Facility (PF) which provides users from all over the world outreach and access to over 60 techniques based on the use of electrons, ions, neutrons and photons for the analysis and synthesis of materials. A number of Associated Facilities (AFs) in France, Italy and the Netherlands complement the offer. Access to all PFs and AFs is managed through a single-entry point on the basis of competitive peer-reviewed scientific excellence, or for commercial users, who may need to keep data and results confidential, it may be purchased at the market rate for the particular infrastructure required. The PFs are strongly complementary to each other and act as a whole as an international agency providing support to the best researchers and research projects, contributing access to advanced analytical and synthesis facilities.

The governance structure involves ministerial representatives of the Member Countries, as well as the directors of the PFs. CERIC management and research activities are distributed in the participating countries and cover administration, communication, technology transfer and project management. A common support system allows the distributed staff to operate in an integrated way for transnational and cooperative projects and joint ventures.

CERIC Partner Facilities, Instruments and Techniques

AUSTRIA

Graz University of Technology

is dedicated to the structural characterisation of nanosystems with scattering techniques covering topics such as advanced materials, (bio-)polymers, proteins in solids, surfaces, liquids and in the gas phase. The facility provides access to its light and X-ray scattering laboratories, as well as to the Austrian SAXS beamline and Deep X-ray Lithography beamline, both at Elettra.

CROATIA

Ruđer Bošković Institute

develops and provides access to ion beam techniques for materials' modification and characterisation, such as PIXE and RBS, as well as a heavy ion microprobe, dual beam irradiation chamber with RBS/channelling, and TOF ERDA spectrometer.

CZECH REPUBLIC

Charles University Prague

has expertise in surface and materials science, electrochemistry and hydrogen technologies. It offers access to the Surface Science Laboratory and the Materials Science Beamline at the synchrotron Elettra for photoelectron and X-ray absorption spectroscopies, low energy electron diffraction and microscopy techniques, as well as to the Hydrogen Technology Centre to study materials and their assemblies in hydrogen fuel cells and water electrolysers, also under operating conditions.

HUNGARY

Budapest Neutron Centre

performs and offers R&D in nuclear science and technology, studying the interaction of radiation with matter and performing isotope and nuclear chemistry, radiography and radiation chemistry, surface chemistry and catalysis. Neutron scattering instruments allow investigation of the microscopic properties of solids, liquids, soft materials, biological objects and condensed matter.

ITALY

Elettra Sincrotrone Trieste

offers a third-generation synchrotron light source specialised in the fine analysis of matter. Its beamlines cover a wide variety of experimental techniques and scientific fields, including photoemission and spectroscopy, crystallography, imaging at micro and nanoscale, X-ray imaging, X-ray and IR microscopy, etc. The investigated research fields span materials science, surface science, solid-state chemistry, atomic and molecular physics, as well as biology, medicine and cultural heritage.

POLAND

National Synchrotron Radiation Centre SOLARIS

offers X-ray photoemission, absorption spectroscopy of soft, tender and hard X-rays, scanning transmission X-ray microscopy, photoemission electron microscopy, angle- and spin-resolved photoelectron spectroscopy, hard X-ray microimaging and microspectroscopy, and the cryo transmission electron microscope enabling researchers to look at the macromolecules almost in their natural environment.

ROMANIA

National Institute of Materials Physics

offers access to high-resolution transmission electron microscopy and electron paramagnetic resonance laboratories for research in solid state physics and materials science, including the synthesis and characterisation of advanced materials for applications in microelectronics, catalysis, energy industry and ICT.

SLOVENIA

National Institute of Chemistry

offers NMR spectroscopy for chemical analysis and identification, for determining 3D structures and studying the dynamics of small and larger bio-macro-molecules, for tracking chemical reactions in analytical and bioanalytical procedures, for studying polycrystallinity and identifying metabolites and various amorphous forms.

Associated Facilities

EUROPEAN COMMISSION

European Commission's Joint Research Centre (JRC) Nanobiotechnology Laboratory in Ispra
Offers facilities and instruments for interdisciplinary studies with a special focus on nanomaterials, nanomedicines, advanced materials, micro(nano)plastics, and innovative technologies for health.

European Commission's Joint Research Centre (JRC) Fuel Cell and Electrolyser Testing Facility (FCTEST)
Which allows testing of low and high-temperature PEM fuel cell and electrolysis test stations in single cell and stack.

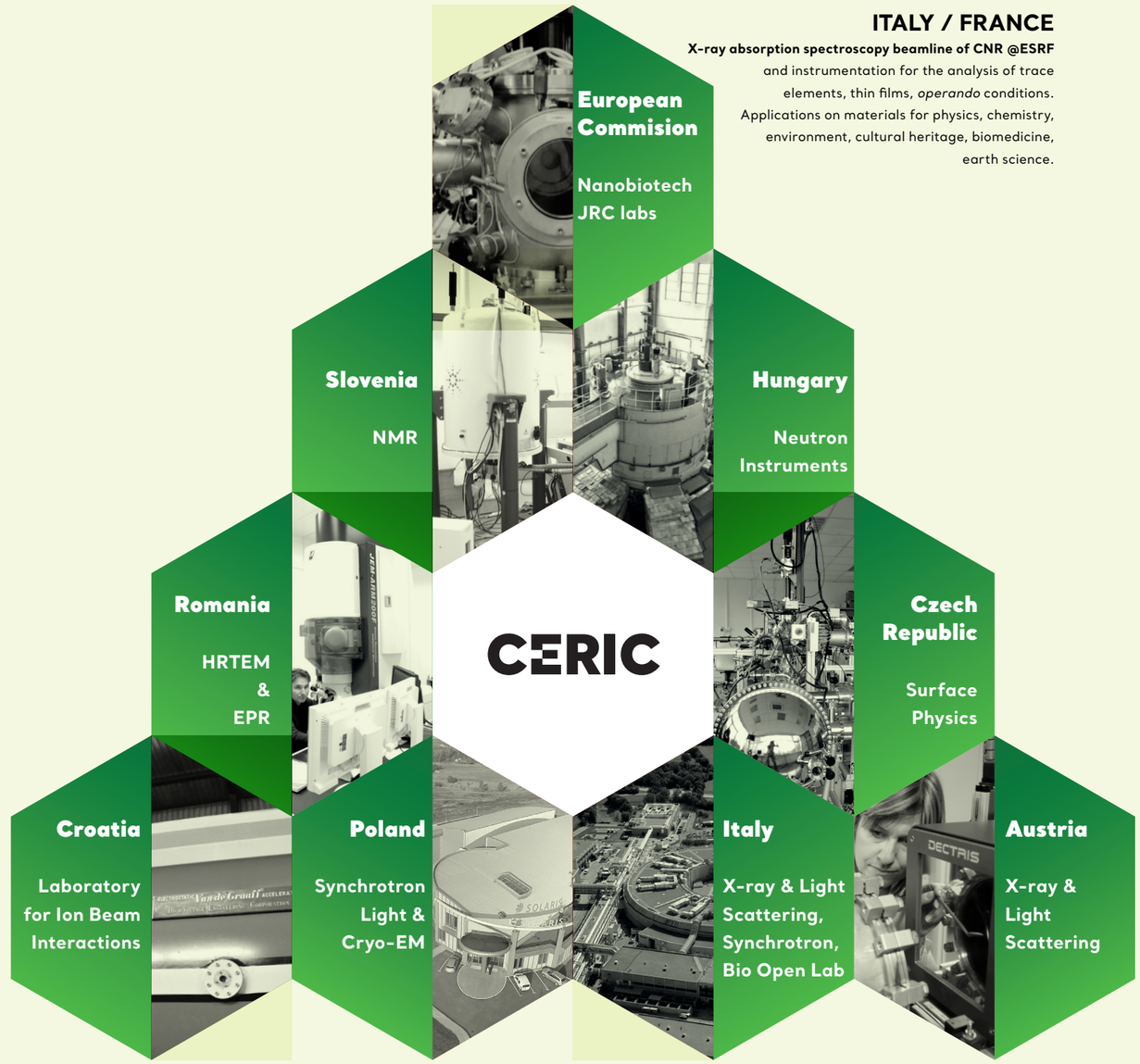
European Commission's Joint Research Centre (JRC) Battery Energy Storage Testing Laboratory (BESTEST)
Allowing to analyse the performance of battery materials and devices by cycling them under controlled environmental conditions.

ITALY

Bio Open Lab (BOL) in Salento, Salerno and Trieste
Providing an integrated system of research equipment and instruments dedicated to investigations in the field of biological and biomedical research.

ITALY / FRANCE

X-ray absorption spectroscopy beamline of CNR @ESRF
and instrumentation for the analysis of trace elements, thin films, *operando* conditions. Applications on materials for physics, chemistry, environment, cultural heritage, biomedicine, earth science.



1

Promoting Scientific Excellence

The objectives of CERIC, as described in the Statutes, are to:

- Contribute to European top-level research and technological development and demonstration programmes and projects, thus representing an added value for the development of the European Research Area (ERA) and its innovation potential while stimulating a beneficial impact on the scientific, industrial and economic development.
- Further the integration of national Facilities operating mainly in the Central European Area, into a unique, EU-level distributed RI, open to researchers at world level.
- Make optimum use of resources and know-how by coordinating research and development of relevant technologies, by promoting and coordinating joint training of scientific and technical personnel and young researchers, and by collaborating with neighbouring communities and industry

Main Achievements in 2025

1. **Implementation of two Calls for free open access to which 247 proposals, for a total number of 326 instrument requests, were received. Proposals were submitted from 36 countries.**
2. **Continuous fast-track access for feasibility studies and commissioning, and possibility to perform experiments via remote access.**
3. **Positive evaluation of the Italian, Austrian and Slovenian Partner Facilities.**
4. **Participation in externally funded projects: IMPRESS, ReMade@ARI, ERA-Shuttle, OPVStability, ERIC Forum 2, OSCARS, ACTNXT.**

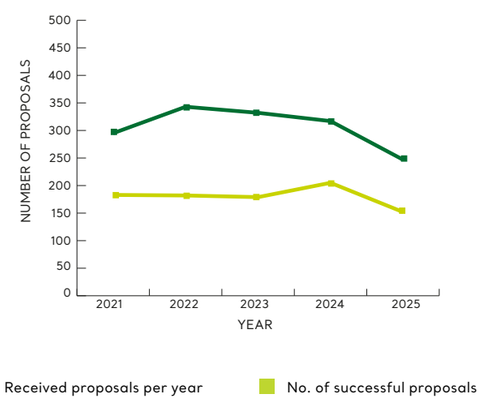
Open Access

CERIC's main aim is to enable excellent science, both as a service to international users and as an in-house activity. This is achieved mainly by providing merit-based open access to its research facilities and promoting internal research. In 2025, CERIC launched two Calls for Proposals to use the Consortium's research instruments: 247 proposals were received. Given the multi-technique character of many of them, this corresponds to 326 single-instrument requests.

In 2025 both the Croatian and the Italian Partner Facilities had limited operations. In particular, the Italian one underwent a shutdown of the online beamlines for the planned upgrade of the experimental hall, which will lead to the completion of a fourth-generation synchrotron, whose first beamlines are expected to be operational by the end of 2026. This resulted to a downward shift (-22%) in the number of received applications.

152 proposals, equivalent to 204 single-instrument proposals, were selected (Figure 1) for the use of the over 60 techniques available in the CERIC open access offer, to perform experiments for a total of 16.912 experimental hours. In addition to physical access to the CERIC facilities, all facilities continued to offer the possibility of performing measurements remotely through sample mailing. In 2025, 18% of experiments were conducted in this modality.

Figure 1
Number of received and successful proposals per year



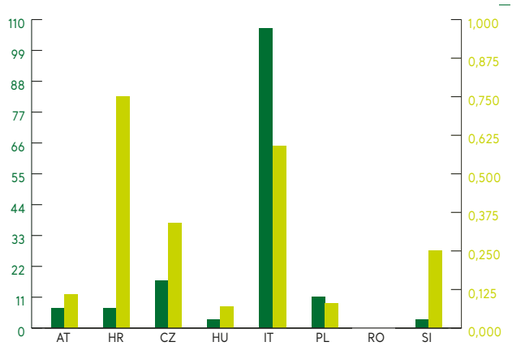
CERIC remains a highly internationalised RI, with principal investigators coming from 36 countries, both European and non-EU (19%), in 2025.

To summarise:

- **2 Calls for Proposals**
- **247 proposals received**
- **204 allocated instrument requests**
- **Research groups from 36 countries**

The majority (62%) of submitted proposals in 2025 came from CERIC Member Countries, as in the previous years. The most active researchers, in relation to the number of full-time employees in Research & Development in a country, are from Croatia, followed by Italy and Czech Republic (Figure 2).

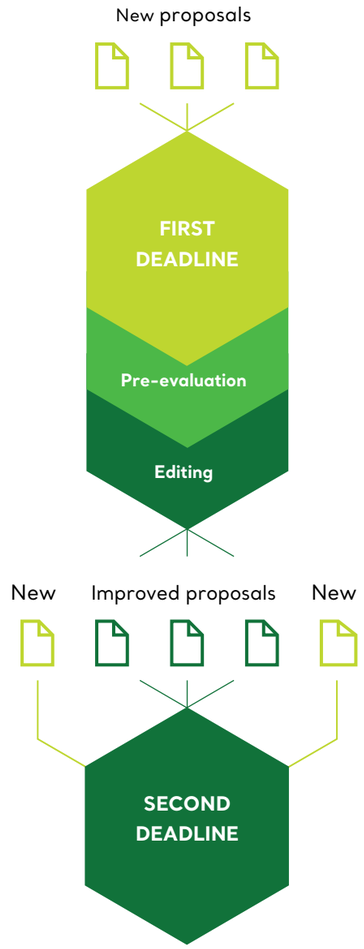
Figure 2
Submited proposals per 1K full-time employees (FTE) in R&D in Member Countries. The FTE values are calculated from data available on the Eurostat website of the European Commission, by selecting the country, the year of interest, and 'researchers' as the professional position.



In 2025, 44% of the principal investigators and 40% of the researchers who performed the measurements at the facilities were women (Figure 3).

Figure 3
Gender distribution of CERIC users

CERIC Two-steps Deadline Procedure



Fast Track Access

Fast Track Access stayed open throughout the whole year 2025, allowing access to a set of relevant instruments for research and testing to be scheduled within one month from the submission of the proposal, based on an evaluation performed by the PF. As in the previous year, a wide number of techniques at the Austrian, Czech, Italian, and Slovenian PFs have been devoted to this purpose. During 2025, 56 proposals were received for this access mode, with a large increase (+70%) compared to the previous year. In particular, 10 proposals were related to commissioning of the Inelastic Ultraviolet Scattering Offline laboratory (IUVS-Offline) at Elettra Sincrotrone Trieste.

Quantity and quality of the research output

In 2025, the total number of publications arising from data gathered at CERIC's facilities reached the same amount (129) of 2024. The average Impact Factor (IF) slightly decreased (-9%) if compared to 2025, with a value of 7,06. However, it is important to note that this decrease is not significant, and that IF alone is not an ideal indicator of output quality. Then, also in 2025, CERIC collected data on the most cited publications, expressed as the share of CERIC's papers among the top 10% (figure 6) and top 20% most frequently cited ones. In 2025, 14,09% of CERIC papers are in the top 10% most cited studies in their related fields, which is a significant increase compared to the previous year.

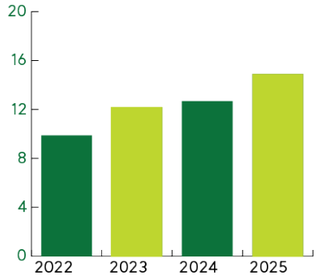


Figure 4
Share of publications, based on the research performed using facilities/resources of RIs, in top 10% most cited papers among a comparable field in the latest 3 years. All the publications tied at the threshold of top10% are taken in consideration.

International Scientific and Technical Advisory Committee - ISTAC

The primary role of the ISTAC within CERIC is to offer guidance to the General Assembly (GA) regarding scientific and technological matters that significantly influence the optimal use of CERIC as a cutting-edge RI. Specifically, ISTAC assesses proposals for potential new PFs and oversees the functioning of existing ones, making recommendations to the GA concerning acceptability and continuation in CERIC's open access service. Within this framework, the periodic evaluation of the Italian and Austrian PFs was held in May 2025, with a site visit by the members of the ISTAC and additional international experts (from Diamond Light Source and MAX IV) at Elettra Sincrotrone Trieste. The Slovenian PF was also reviewed by members of ISTAC in October 2025, with a site visit by the members of the ISTAC and additional international experts (from the University of Turin and the Central European Institute of Technology) at the National Institute of Chemistry in Ljubljana.

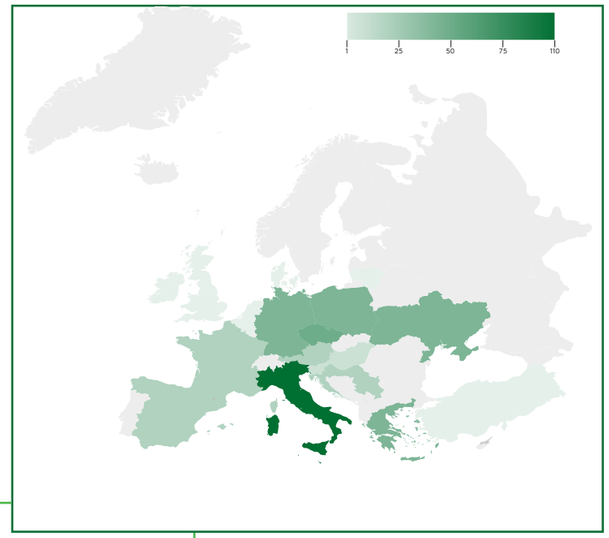
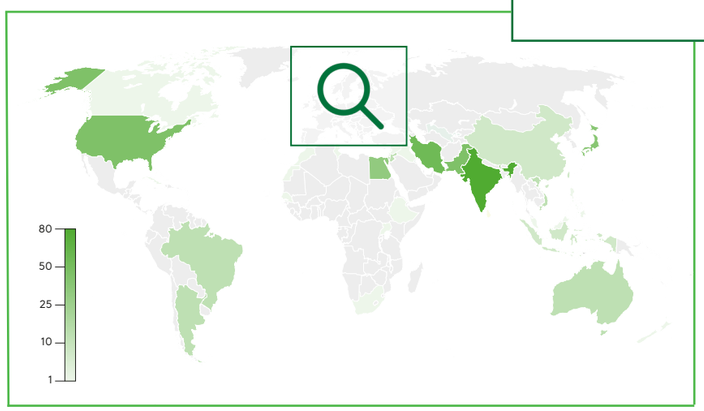


Figure 5a and 5b
Proposals received from European and non-European countries between 2014 and 2025.



68 COUNTRIES ENGAGED WORLDWIDE SINCE 2014

Scientific Highlights

A nanoscale shield for more durable perovskite solar cells[3]

ENERGY | SOLAR CELLS

X-RAY PHOTOELECTRON SPECTROSCOPY

Perovskite solar cells have revolutionised the photovoltaics world. Yet, one major obstacle still stands between perovskites and widespread commercial use: long-term stability, because this material tends to degrade when exposed to heat, moisture, light, and even their own neighboring layers inside the solar cell.

Das Chittaranjan

Kedia Mayank

Seliba Michael

Das Chittaranjan, Kedia Mayank, Saliba Michael (University of Stuttgart) and colleagues tackled this problem by focusing on one of the most vulnerable parts of a perovskite solar cell: the interfaces between layers, in which unwanted chemical species can migrate, accelerating degradation over time. Researchers borrowed a technique, atomic layer deposition (ALD), from microelectronics: ALD allows materials to be deposited into one atomic layer at a time, producing extremely thin and uniform coatings. The team deposited an ultrathin layer of aluminum oxide (alumina) onto a state-of-the-art perovskite absorber at room temperature, thus avoiding to damage the sensitive perovskite underneath.

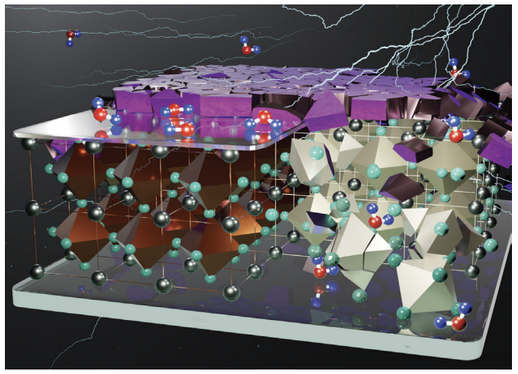


Figure 6
The cover of Energy & Environmental Science (2025, volume 18) related to the present research. alloy scientific picture

Then, using high-resolution techniques, including Near Ambient Pressure X-ray Photoelectron Spectroscopy available at the CERIC Czech Partner facility, scientists confirmed that the alumina layer forms a continuous, conformal “nanoscale shield” over the perovskite surface. Despite being so thin, this layer had a big impact: solar cell efficiency increased and, more importantly, stability improved dramatically. Unencapsulated cells with the alumina layer retained about 75% of their initial performance after six months, while unprotected cells dropped to just 10%. Moreover, in outdoor-like testing over 1.500 hours, the protected devices maintained almost all their efficiency.

These results show that alumina layers block moisture from entering the perovskite, and also that they prevent harmful compounds from the adjacent charge-transport layer to diffuse into it. The ultrathin coating preserves the perovskite’s crystal structure and slows degradation, bringing perovskite solar cells one step closer to real-world deployment.

"Atomic layer deposition has been used to create an ultrathin alumina nanoscale shield that boosts perovskite solar-cell efficiency and delivers unprecedented long-term stability."

[3] **Mitigating the amorphization of perovskite layers by using atomic layer deposition of alumina**, Kedia M., Das C., Kot M., Yalcinkaya Y., Zuo W., Tabah Tanko K., Matvija P., Ezquer M., Cornago I., Hempel W., Kauffmann F., Plate P., Lira-Cantu M., Weber S.A., Saliba M., Energy and Environmental Science, 2025, DOI: https://doi.org/10.1039/D4EE05703A

Hybrid Photoanodes for solar fuels: when molecular catalysis makes the difference[4]

ENERGY | CATALYSIS

X-RAY ABSORPTION SPECTROSCOPY

Turning sunlight into fuel is one of the most compelling challenges in modern energy research. Photoelectrochemical (PEC) cells aim to do that, converting solar energy into hydrogen - a clean fuel with exceptional energy density - by splitting water. Among the most promising materials for this task are metal oxide semiconductors such as $BiVO_4$ and WO_3, valued for their stability and affordability. However, their performance is often limited by inefficient charge transport and rapid recombination of photogenerated carriers.

Alberto Piccioni

"This work highlights how combining molecular precision with solid-state platforms can unlock new pathways toward efficient solar fuel generation."

Federico Boscherini, **Alberto Piccioni**, **Luca Pasquini**, **Raffaello Mazzaro** (University of Bologna) and colleagues tackles this problem by integrating a molecular copper-based water oxidation catalyst (WOC) into a $BiVO_4$–WO_3 heterojunction. The catalyst, based on a robust tetra-amidomacrocyclic ligand framework, is electropolymerized onto the semiconductor surface, forming a hybrid material. As demonstrated by state-of-the art spectroscopic analyses, partly performed at the LISA X-ray absorption spectroscopy beamline at CNR@ESRF (CERIC Associated Facility), this molecular system retains its integrity under operating conditions that mimic real-life operations.

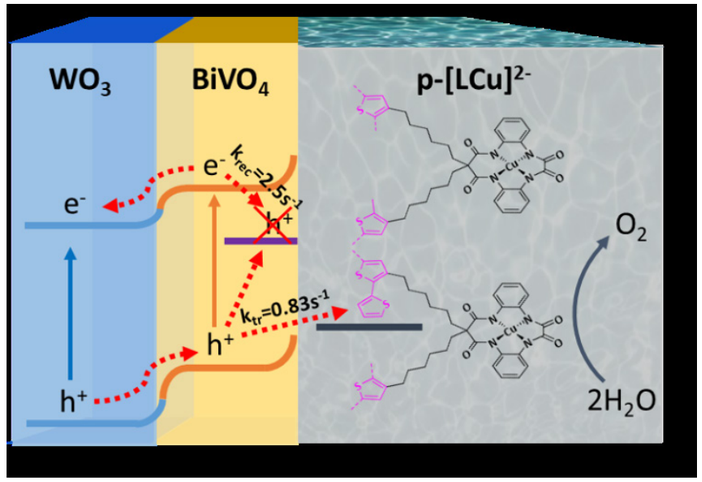


Figure 7
Schematic representation of the charge transfer mechanism with and without p-[LCu]2- correlated with the recombination and charge transfer rate constants.

The result is a marked improvement in device performance: charge recombination is reduced by 62%, while the catalyst actively mediates hole transfer to water, enhancing both efficiency and stability during prolonged operation. Rather than acting as a passive coating, the copper complex plays a dynamic role in facilitating the oxygen evolution reaction.

[4] **Hybrid Molecular Photoanodes for Water Oxidation Based on Electropolymerized Cu Macrocyclic Complexes on BiVO4-WO3**, Bellido C.G., Mazzanti M., Ranu K., Piccioni A., Mazzaro R., Boscherini F., Salomón F.F., Grau S., Sala X., Pasquini L., Llobet A., Caramori S., Advanced Energy Materials, 2025, DOI: https://doi.org/10.1002/aenm.202500253

X-RAY SCATTERING

Scientists developed a homeostatic photonic device inspired by nature[5]

MATERIALS SCIENCE | PHOTONICS

Homeostasis, the ability to dynamically regulate internal conditions in response to external stimuli to optimise perfomance, is one of the most difficult feature to replicate from biological systems (that apply it in many different situation: from the adaptive sensitivity of the human eye to the light-management strategies of plant leaves).

Marco Faustini

Cédric Boissière

Marco Faustini, Cédric Boissière and colleagues try to tackle this using the knowledge of materials science, developing and characterising an artificial optical device that mimics these sophisticated behaviors. Key element of the developd device is a graded mesoporous one-dimensional photonic crystal, fabricated via sol-gel processing and dip-coating. This structure acts simultaneously as a sensor and an actuator, responding to light intensity by modulating its optical and thermal properties. Coupled with a photothermal layer, the device can either amplify or suppress light absorption and local heating, effectively switching between positive and negative feedback regimes depending on illumination conditions. Using advanced techniques, such as Grazing-Incidence Small-Angle X-ray Scattering (GI-SAXS) available at CERIC Austrian Partner Facility, researchers gained nanoscale insight into the layered architecture and its evolution under operating conditions, which is critical

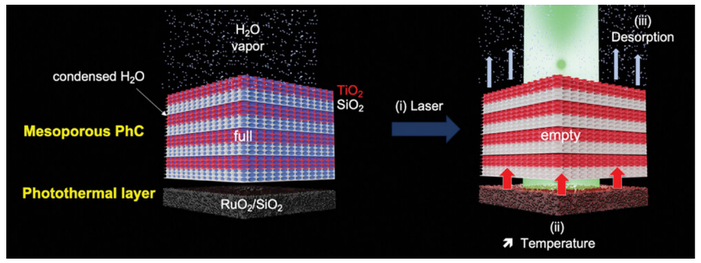


Figure 8
Illustration of a device composed of a photothermal layer and a 1D mesoporous photonic crystal in presence of vapor. i) Laser irradiation results in ii) an increase in temperature in the device due to photothermal effect. Local heating provokes (iii) water desorption from the mesoporosity processes resulting in a decrease in the refractive index of the mesoporous layer and a blue-shift of the photonic band.

for understanding how structural features translate into macroscopic optical responses.

This proof-of-concept device represents a significant step toward autonomous, life-like optical systems. By combining thermal, optical, and sorptive feedback in a single platform, it opens new possibilities for smart windows, adaptive filters, and responsive photonic technologies. Interestingly, the developed polymer showed a high chemical stability, as well as anisotropic fluorescent response. The use of 3D-oriented MOF systems as precursors could then be considered an efficient strategy to prepare oriented porous polymers, which will advance optical components and microdevices for photonic applications.

"We developed and tested a photonic device that exploits responsive porous materials to replicate optical homeostasis, one of the most intriguing ability of biological system".

[5] **A Homeostatic Photonic Device Integrating Vapor-Regulated Thermo-Optical Feedback Mechanisms**, Byun C., Ceratti D.R., Mimoso C., Boissière C., Faustini M., Advanced Functional Materials, 2025, DOI: https://doi.org/10.1002/adfm.202424453

X-RAY MAGNETIC IMAGING, PHOTOEMISSION ELECTRON MICROSCOPY

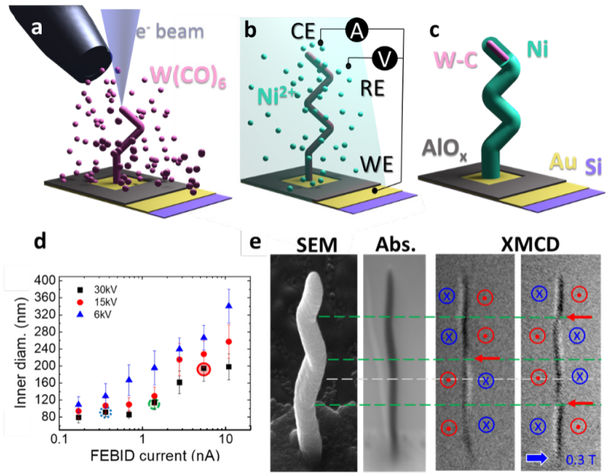
Curved nanotubes as a new frontier for 3D magnetic control[6]

MATERIALS SCIENCE | MAGNETISM

When two-dimensional films are bent into curved forms, entirely new phenomena emerge, changing the physics and behaviour of low-dimensional materials. This is particularly true for three-dimensional magnetic nanotubes, structures with a closed, edge-free geometry that breaks symmetry in ways that give rise to curvature-induced anisotropy and magnetochirality.

Claudia Fernández-González

Claudia Fernández-González, **Sandra Ruiz-Gomez** and colleagues combined focused electron beam induced deposition with electrodeposition to fabricate complex 3D nanotubes, including helical and zigzag structures. These architectures introduce controlled curvature and vertices, enabling direct investigation of how geometry influences magnetism at the nanoscale. Scientists then studied the properties of the developed nanotubes using advanced X-ray magnetic imaging and photoemission electron microscopy (PEEM) of the DEMETER beamline, available at the CERIC Polish Partner Facility. These measurements revealed that all nanotubes host azimuthal magnetic configurations, with domain walls pinned at regions of curvature



such as vertices. This observation, supported by micromagnetic simulations, demonstrates that geometry can be used as a tool to engineer magnetic energy landscapes.

This research opens a pathway toward designing multifunctional 3D nanomagnetic systems, with potential applications ranging from spintronics to unconventional computing architectures.
This research opens a pathway toward designing multifunctional 3D nanomagnetic systems, with potential applications ranging from spintronics to unconventional computing architectures.

Figure 9
a-c) Fabrication of 3D nanotubes. a) Step 1: Direct patterning of the conductive W 3D nanostructure scaffolds by FEBID. b) Step 2: Electrodeposition of a magnetic nickel shell (CE: Counter Electrode; RE: Reference Electrode; WE: Working Electrode; A: current measurement; V: voltage application). c) A schematic of the resulting 3D nanotube structure is shown. (d) Dependence of the inner diameter of W pillars on the e-beam current and voltage settings during the FEBID deposition of W scaffolds. (e) Observation of magnetic vortex state in complex-shape nanotubes by shadow-PEEM. From left to right: SEM image of a zig-zag nanotube; shadow projection of the nanotube; XMCD images of the "as grown" state and after the application of external magnetic field of 0.3 T in the direction of the blue arrow. The blue and red circles represent the orientation of the magnetization vector.

Sandra Ruiz-Gomez

"We fabricated complex magnetic nanotubes by 3D-printing conductive scaffolds followed by conformal magnetic coating. These architected core–shell nanostructures highlight geometry as a powerful design element for next-generation 3D spintronic devices. ".

[6] **Realization of Complex-Shaped Magnetic Nanotubes with 3D Printing and Electrodeposition**, Fernández-González C., Morales-Fernández P., Turnbull L.A., Abert C., Suess D., Foerster M., Niño M.Á., Nita P., A. Mandziak, Finizio S., Bagués N., Pereiro E., Fernández-Pacheco A., Pérez L., Ruiz-Gómez S., Donnelly C., Advanced Functional Materials, 2025, DOI: https://doi.org/10.1002/adfm.202515722

SYNCHROTRON-BASED MICROCT

Bioengineered scaffolds to preserve fertility after ovarian tissue transplantation[7]

BIOLOGY | HEALTH

In recent decades, breakthroughs in cancer treatments have improved survival rates for young female patients. However, the gonadotoxic effects of chemotherapy and radiotherapy often leave survivors facing premature menopause and infertility, heavily affecting long-term quality of life. For prepubertal girls, ovarian tissue cryopreservation and transplantation represents the first-choice approach. Yet, revascularization remains a challenge, since ovarian grafts experience a critical ischemic window - a period of 5 to 10 days before new blood vessels form and perfuse the tissue.

To overcome this problem **Maria Giulia Spazzapan** (University of Trieste), **Chiara Agostinis, Lorella Pascolo** (IRCCS Burlo Garofolo) and colleagues tested the pro-angiogenic potential of four different 3D biomaterial scaffolds (engineered dermal matrices that mimic the natural extracellular environment and encourage tissue regeneration), assessing their ability to interact with ovarian endothelial cells (OVEC). The most suitable skin substitute were employed for seeding OVECs and testing transplantation of human ovarian tissue in the animal model.

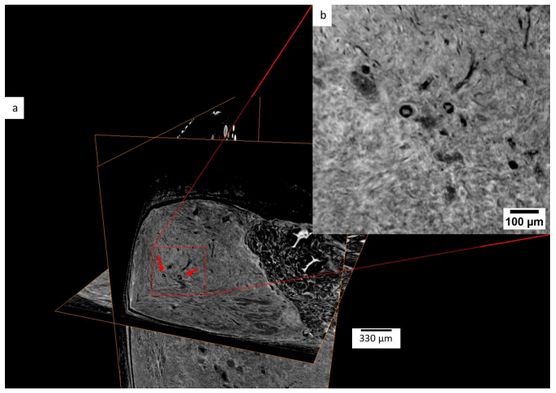


Figure 10
Representations of arbitrary orthogonal planes within the imaged OVECs supplemented tissue: (a) Red arrows point out healthy follicles within a well-preserved tissue (b) Zoomed image of the two follicles (adapted from Spazzapan et al., Bioactive Materials, 2025).


Maria Giulia Spazzapan


Chiara Agostinis


Lorella Pascolo

To investigate the revascularization process researchers used, among ot her techniques, synchrotron radiation-based phase-contrast microtomography (microCT) at the SYRMEP beamline, available at CERIC Italian Partner Facility in Elettra Sincrotrone Trieste. This analytical technique offered non-invasive, high-resolution 3D images that revealed formation of new vascular structures within the scaffold matrix, accumulation of red blood cells in vessel-like formations, clear evidence of OVEC migration into the ovarian tissue, and preservation of healthy primordial follicles post-transplantation. Notably, grafts without endothelial supplementation did not show these vascular features, emphasizing the effectiveness of the OVEC-enhanced scaffold.

These findings mark a significant step forward in fertility preservation for cancer survivors, by combining cryopreserved tissue with endothelial cell-supplemented 3D scaffolds. Moreover, this approach exemplifies the potential of tailored, bioengineered regenerative therapies.

"Through microCT, we showed 3D scaffolds with endothelial cells improve vascularization and follicle survival, supporting future fertility preservation. ".

[7] **Endothelial cell supplementation promotes xenograft revascularization during short-term ovarian tissue transplantation**, Spazzapan M., Pegoraro S., Vuerich R., Zito G., Balduit A., Longo E., Pascolo L., Toffoli M., Meshini G., Mangogna A., Ros G., Buonomo F., Romano F., Lombardelli I., Papa G., Piccinni M.-P. , Zacchigna S. , Agostinis C., Bulla R., Ricci G., Bioactive Materials, 2025, DOI: https://doi.org/10.1016/j.bioactmat.2025.03.021

NMR SPECTROSCOPY

Scientists understood how cytosine methylation shapes G-quadruplex DNA structures[8]

BIOLOGY | GENOMICS

DNA methylation – where a methyl group is linked to position 5 of cytosine residue – is one of the most important examples of epigenetic gene regulation, with wide-reaching effects from development leading to disease. But what happens when this chemical mark meets the architecture of G-quadruplexes (G4s), which are noncanonical, four-stranded DNA conformations formed by guanine-rich sequences?

The introduction of a single 5-methylcytosine into a G-rich sequence originating from the B-cell lymphoma 2 (BCL2) gene promoter affects both the folding kinetics and thermodynamics of the two G4 structures and thus plays a crucial role in regulating G4 folding pathways, which has significant implications for the control of gene expression.

Nataša Medved, **Prof Janez Plavec** and colleagues of the Slovenian NMR Centre studied a GC-rich region upstream of the P1 promoter of the BCL2 gene, which adopts a major G4 structure with a [3+1] hybrid topology—three guanine strands oriented in one direction and the fourth in the opposite – containing cytosine residues that play critical roles in loop formation and structural stability. By introducing individual 5-methylcytosine (5mC) residues, they found that methylation shifts the equilibrium toward a previously uncharacterized minor G4 structure with a parallel topology. This shift was accompanied by slower folding kinetics and decreased thermodynamic stability of the major structure. Using DAVID and ASKA spectrometers available at the Slovenian CERIC Partner facility (Slovenian NMR Centre at National Institute of Chemistry), researchers characterised this minor G4 structure in atomic detail: it features three G-quartets connected by propeller-type loops and a snapback element that fills a structural gap at the 5' end, enhancing its stability. Scientists then showed that cytosine methylation effects are context-dependent: the process can redirect folding pathways, modulate polymorphism, and influence how these structures interact with regulatory proteins.

These findings add a new piece to the puzzle of how epigenetic marks, like 5mC, shape the dynamic structure of DNA, with potential consequences for gene expression, cellular identity, and disease. Moreover, understanding how methylation affects G4s formation and stability opens new doors for epigenetic drug design and precision medicine.

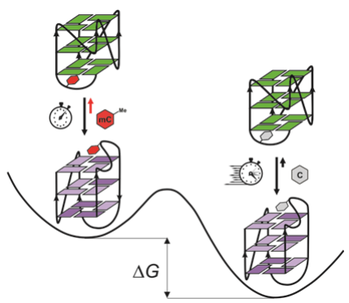


Figure 11
The introduction of a single 5-methylcytosine into a G-rich sequence originating from the B-cell lymphoma 2 (BCL2) gene promoter affects both the folding kinetics and thermodynamics of the two G4 structures and thus plays a crucial role in regulating G4 folding pathways, which has significant implications for the control of gene expression.


Nataša Medved

"Cytosine methylation in the BCL2 promoter affects G-quadruplex folding kinetics and structural equilibrium, regulating transcription factor interactions as a new layer of epigenetic control."


Janez Plavec

[8] **Beyond Structure: Methylation Fine-Tunes Stability and Folding Kinetics of bcl2Mid G-Quadruplex**, Medved N., Cevec M., Javornik U., Lah J., Hadži S., Plavec J., Angewandte Chemie – International Edition, 2025, DOI: https://doi.org/10.1002/anie.202507544

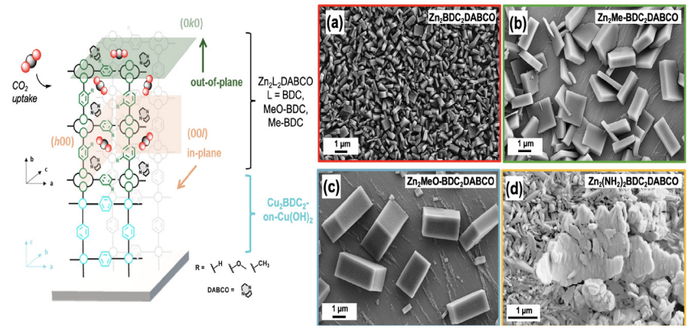
X-RAY SCATTERING, INFRARED MICROSCOPY

Light-responsive MOF films offer scalable solution for carbon capture and storage[9]

NANOTECHNOLOGIES | ENVIRONMENT

Carbon neutrality goals aim to mitigate human impact on climate change achieving a balance between carbon dioxide (CO2) emissions and its adsorption or sequestration from the atmosphere. Within this context, Metal-Organic Frameworks (MOFs), known for their exceptional porosity and tunable chemistry, are among the most promising candidates for future CO_2 mitigation strategies. However, their integration and use have been slowed down by difficulties in fabricating functional, stable forms - especially films or membranes - compatible with industrial systems.

To solve this, **Sumea Klokic** (former CERIC-ERIC post-doc, now researcher at TU Graz), **Giovanni Birarda** (Elettra Sincrotrone Trieste) and colleagues engineered flexible Zn-based MOF films grown as heteroepitaxial layered structures on substrates. These films incorporate functionalized organic linkers, including photo-switchable molecules like azobenzene, enabling reversible CO_2 capture triggered by light (both ultraviolet and visible). Using a combination of cutting-edge analytical techniques available in CERIC-ERIC Austrian and Italian Partner Facilities - including grazing incidence wide angle X-ray scattering (GIWAXS) and infrared spectromicroscopy - scientists



have been able to deeply characterise the developed reversible, low-pressure CO2 capturing film system, observing molecular-scale interactions and quantifying CO_2 uptake in real time (especially under external stimuli such as light and temperature).

These findings show that heteroepitaxial Zn-MOF films can reversibly adsorb CO2 at near-ambient conditions while their flexibility and uptake behaviour can be tuned and remotely controlled using light. Such insights could unlock further application of MOFs besides carbon storage, including gas separation devices, mixed matrix membranes, and environmental sensors.

Figure 12
Structure of the Zn-MOF films and Scanning Electron Microscopy (SEM) micrographs. Schematics for the heteroepitaxial growth of the Zn2L2DABCO structures. Two planes align in-plane (orange highlighted areas), whilst another one (green highlighted area) orients in the out-of-plane direction being parallel to the substrate. SEM micrographs of the functionalized structures are shown for (a) Zn2BDC2DABCO, (b) Zn2Me-BDC2DABCO, (c) Zn2MeO-BDC2DABCO and (d) Zn2(NH2)2-BDC2DABCO [adapted from Klokic et al., Flexible metal-organic framework films for reversible low-pressure carbon capture and release, Nature Communications (2025)].


Sumea Klokic


Giovanni Birarda

"Our findings show that it is possible to design MOF films that not only operate at near-ambient conditions but can be controlled remotely using light."

[9] **Flexible metal-organic framework films for reversible low-pressure carbon capture and release**, Klokic S., Marmiroli B., Birarda G., Lackner F., Holzer P., Sartori B., Abbasgholi-NA B., Dal Zilio S., Kargl R., Stana Kleinschek K., Stani C., Vaccari L., Amenitsch H., Nature Communications, 2025, DOI: https://doi.org/10.1038/s41467-025-60027-6

WATER ELECTROLYSER TESTING

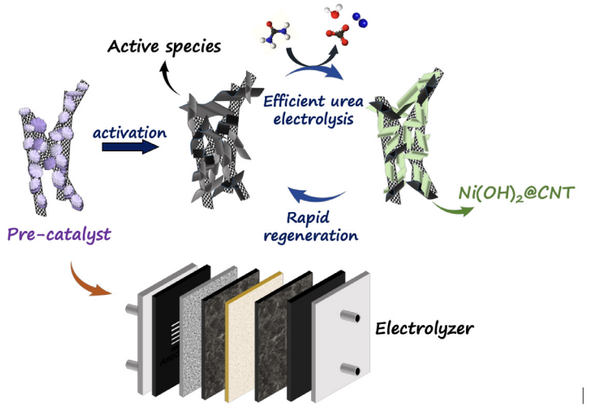
Self-transforming nickel pre-catalyst powers hydrogen from urea[10]

CATALYSIS | HYDROGEN

Urea electrolysis is an emerging energy conversion technology that uses the oxidation of urea, commonly found in wastewater — as a low-energy pathway for hydrogen generation. Because urea breaks down at a much lower voltage than water, this process can significantly reduce the energy required for hydrogen production while simultaneously treating urea-rich waste streams.

In this context, a research team led by **Dr. Neena S. John** and Ph.D student, Mr. **Nikhil N. Rao** at the Centre for Nano and Soft Matter Sciences (CeNS),Bengaluru, an autonomous institute under Department of Science and Technology (DST, Govt. of India) has developed a nickel hydrazine chloride "pre-catalyst" that transforms itself into a highly active material during electrolysis. This self-generated active phase enables efficient hydrogen production from urea-containing solutions.

Under operating conditions, the catalyst reconstructs into a highly efficient active phase that shows excellent electrocatalytic activity and long-term stability. Using CERIC-supported access and in collaboration with Dr. **Peter Kúš** at the Czech partner facility, Hydrogen Technology Centre (HTC), Charles University, Prague, the team successfully implemented these advanced pre-catalysts in state-of-the-art anion-exchange membrane electrolyser systems. These device-level studies demonstrated the catalyst's strong performance in a realistic operational environment.



The combination of in situ characterisation methods and advanced electrolyser testing highlights the significant potential of these nickel-based pre-catalysts to enhance hydrogen generation through urea-assisted water electrolysis.


Nikhil N. Rao
Neena S. John
Peter Kúš

"AEM electrolyser tests show that a self-transforming nickel pre-catalyst delivers efficient urea electrolysis, highlighting strong potential for clean hydrogen production."

Figure 13
Use of the nickel hydrazine chloride pre-catalyst to enhance hydrogen production from urea.

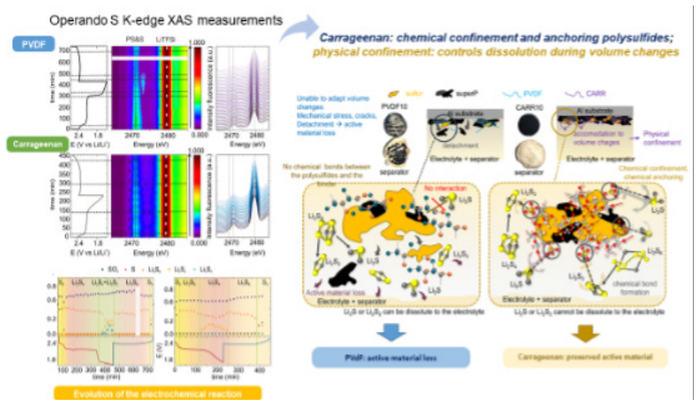
[10] **Accelerated Electro-Conversion of a Nickel Coordination Complex for Hybrid Water Electrolysis,** Rao N.N., Kumar A.A., Kus P., Alex C., Kovilakath M.S.N., Hrbek T., Matolinova I., John N.S., Small, 21, e07907 (2025). DOI: 10.1002/smll.202507907

X-RAY ABSORPTION SPECTROSCOPY

Scientists exploited a seaweed-based natural binder to enhance lithium–sulfur batteries[11]

ENERGY | BATTERIES

Lithium-sulfur (Li-S) batteries have long been considered a next-generation energy storage technology because of their higher energy density and longer lifetimes than conventional lithium-ion systems. However, their practical deployment has been blocked by a persistent issue: the so called “shuttle effect” which happens when soluble polysulfide intermediates migrate within the cell, degrading performance and efficiency.



Dóra Zalka

Figure 14
Combined mechanistic and operando spectroscopic evidence shows that, unlike PVdF, the CARR binder enables mechanical accommodation and chemical anchoring of sulfur species, suppressing Li2S2/Li2S dissolution and stabilizing Li–S conversion pathways.

While research has mostly focused on engineering increasingly complex cathode architectures, **Dóra Zalka, Andrea Strakova Fedorkova, Alexey Maximenko, Pál Jóvári** and their colleagues investigated an often-overlooked component: the binder. Up to now mainly polyvinylidene fluoride (PVDF) has been used as binder material, Scientists studied the behaviour of a sustainable alternative: carrageenan, a polysaccharide derived from red seaweed. By systematically varying binder content and keeping all other parameters constant, researchers could isolate the binder’s true role: electrodes with 10 wt% carrageenan outperform PVDF-based ones in capacity, sulfur utilization, and cycling stability. Moreover, researchers analysed the structural integrity, sulfur distribution, and reaction kinetics applying advanced investigation techniques, such as X-ray absorption spectroscopy performed in transmission mode (an approach rarely applied to operating Li-S cells) carried out at the ASTRA beamline of the SOLARIS National Synchrotron Radiation Centre, available at CERIC Polish Partner Facility. These experiments enabled precise quantification of polysulfides throughout the electrolyte volume, showing that carrageenan actively binds and stabilizes intermediate species, suppressing the loss of active material.

Besides improving batteries performance, carrageenan offers a greener and scalable solution, eliminating toxic solvents and costly processing steps and bringing Li-S batteries one step closer to real-life application.

“Red-algae-derived carrageenan binder material outperformed PVDF in Li–S cathodes, and transmission S K-edge XAS confirmed short-chain polysulfide trapping, consistent with high-capacity retention after 1000 cycles.”

[11] **Improving lithium-sulfur battery performance using a polysaccharide binder derived from red algae**, Zalka D., Vizintin A., Maximenko A., Pászti Z., Dankházi Z., Hegedüs K., Shankar L., Kun R., Saksl K., Strakova A., Jóvári P., Communications Materials, 2025, DOI: https://doi.org/10.1038/s43246-025-00734-1

INFRARED MICROSCOPY

Even Antarctica toughest insect ingests microplastics, but – for now – with low risk[12]

ENVIORNMENT | MICROPLASTIC

Plastic pollution has become a defining environmental issue worldwide. Although Antarctica is geographically isolated, previous research has already shown that microplastics can reach the continent. However, until now, little was known about how these pollutants affect the tiny soil-dwelling invertebrates that form the foundation of Antarctic land ecosystems.

Nicholas Teets (University of Kentucky), Elisa Bergami (University of Modena and Reggio Emilia), Lisa Vaccari (Elettra Sincrotrone Trieste) and colleagues analysed, using state-of-the-art techniques (such as micro–Fourier Transform Infrared spectroscopy available at CERIC Italian Partner Facility), both lab-exposed and wild-collected midge larvae of Belgica antarctica, the continent’s only endemic insect and one of its most abundant terrestrial animals.

Researchers could then detect for the first time microplastic fragments inside the digestive tracts of wild midge larvae, even if ingestion was rare and detected in fewer than 7% of field-collected individuals. Interestingly, when larvae were experimentally exposed to microplastic beads for 10 days, researchers found neither effect on survival (even at doses far exceeding expected environmental levels) nor detectable change in metabolic rate. However, they observed a decrease in lipid reserves at high doses.

Nicholas Teets

Elisa Bergami

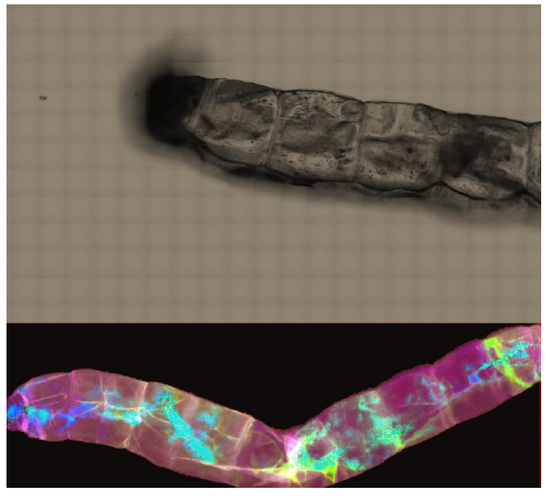


Figure 15
Overlay of optical and IR images of two Belgica antarctica laying one along the other after being deposited on CaF2 slides. The false-color RGB image has been obtained by merging three IR channels: the red represents the vinyl C-H stretching present in some plastics but also in the cuticle, the green channel depicts the overall lipid distribution, and the blue channel portrays the overall protein distribution.

While the immediate physiological effects on B. antarctica appear minimal, the long-term consequences - especially under increasing environmental stress - remain unknown. More in-depth studies are then urgently needed, also to examine possible tissue damage or molecular responses within insects exposed to plastics.

Lisa Vaccari

“For the first time, we have demonstrated ingestion of microplastics by the only endemic insect in Antarctica in its natural habitat, and we quantified physiological effects in the laboratory.”

[12] **Prevalence and consequences of microplastic ingestion in the world’s southernmost insect, Belgica antarctica**, Devlin J.J., Lima C., Kawarasaki Y., Gantz J.D., Pavinato V.A.C., Scaramelli M., Ferrari V., Vaccari L., Birarda G., Bergami E., Michel A.P., Convey P., Hayward S.A.L., Teets N.M., Science of the Total Environment, 2025, DOI: https://doi.org/10.1016/j.scitotenv.2025.180800

HIGH-RESOLUTION TRANSMISSION ELECTRON MICROSCOPY, ELECTRON PARAMAGNETIC RESONANCE

Improving low-temperature NO_2 nano-sensors exploiting surface defects[13]

SENSING | SEMICONDUCTORS

Tin dioxide (SnO_2) has long stood out as a versatile semiconductor, prized for its stability, low cost, and wide band gap. Yet, its full potential in gas sensing — especially for pollutants like NO_2 — has been limited by high operating temperatures and an incomplete understanding of how surface defects influence performance. A recent study takes a decisive step forward by dissecting, at the atomic scale, how synthesis conditions shape these crucial defects.

Using a base-free hydrothermal route with a $SnCl_2$ precursor, a research group at NIMP - National Institute of Materials Physics (Bucharest), including CERIC PhD **Catalina Mihalcea**, engineered SnO_2 nanoparticles with controlled morphology and defect populations. In this way residual Sn^{2+} ions in the lattice promote the formation of oxygen vacancies, widely suspected to enhance gas sensing. By simply tuning the growth temperature (120-160 °C), the team achieved striking differences in sensor response: the sample synthesized at 120 °C exhibited a signal up to nine times higher than its higher-temperature counterpart, operating effectively even at just 100 °C. Thanks to the High-Resolution Transmission Electron Microscopy (HRTEM) and Electron Paramagnetic Resonance (EPR) analyses performed at the CERIC Romanian Partner Facility at NIMP, scientists discovered slight yet decisive structural changes that can explain these differences in performance: smaller, quasi-isotropic nanoparticles with a higher proportion of reactive, high-index facets in the best-performing samples, versus larger, elongated grains dominated by less active facets at higher synthesis temperatures.

Combined with electrical measurements under controlled atmosphere and XPS data, the study demonstrates that not just the presence, but also the concentration and organization, of surface oxygen vacancy complexes govern NO_2 sensitivity, paving the way for more efficient, low-temperature and cleaner gas sensors.

"This work evidences the direct correlation between the gas sensing properties and the morphology-related surface properties of SnO2 nanoparticles controlled by fine adjustment of the synthesis conditions."

[13] **Tailoring surface defects and faceting in SnO2 nanocrystals to improve their NO2 sensing potential**, Ghica C., Stefan M., Stanoiu A., Simion C.E., Vlaicu I.D., Apostol N.G., Mihalcea C.G., Iacoban A.C., Florea O.G., Bulat S., Ghica D., Surfaces and Interfaces, DOI: 10.1016/j.surfin.2025.107212

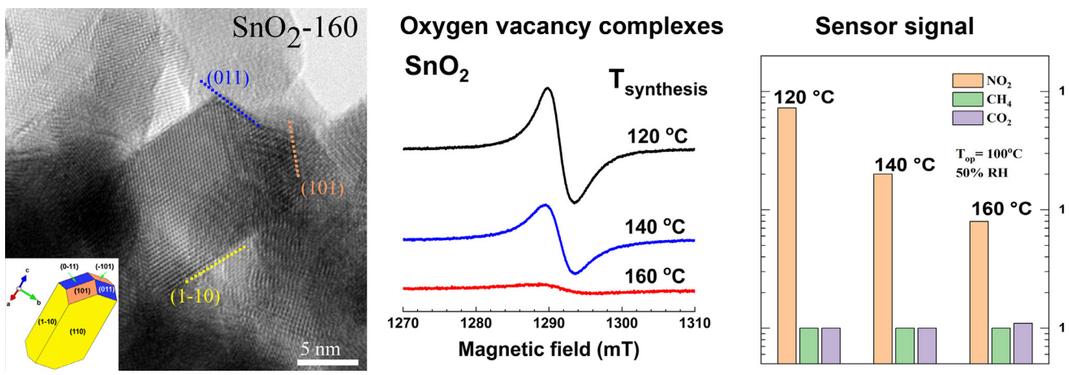


Figure 16
Summary of the analyses conducted and the main results obtained (adapted from Ghica et al., Surfaces and Interfaces, 2025).

X-RAY DIFFRACTION, NEUTRON DIFFRACTION

How Rare-Earth ions doping can turn YPO_4 into a multifunctional phosphor[14]

MATERIALS SCIENCE | PHOTONICS

Phosphors, or photoluminescent materials – materials that emit visible and infrared light upon irradiation with visible light, ultraviolet radiation or X-rays - are central to modern photonics and devices, from LEDs to biomedical imaging. Scientists are therefore always on the lookout for new materials – whether natural or synthetic – with photoluminescent properties.

Suruchi Sharma, **Atul Khanna**, **Margit Fabian** and colleagues explored how yttrium phosphate (YPO_4), a robust and chemically stable host lattice, can be transformed into a versatile light emitter through selective doping with rare-earth ions. The key lies in YPO_4's zircon-type tetragonal structure, which incorporates rare-earth ions without disrupting its crystalline framework. Using high-temperature solid-state sintering, researchers avoided the incorporation of water molecules that reduces luminescence, obtaining a structurally pure material with enhanced optical performance. In fact, optically, the material proves to be remarkably tunable: depending on the dopant, YPO_4 emits across a wide spectral range:blue (Ce^{3+}, Dy^{3+}), red (Eu^{3+}, Sm^{3+}), green and red upconversion (Er^{3+}) and even mid-infrared (Nd^{3+}). Moreover, using neutron diffraction PSD beamline available at the CERIC Hungarian Partner Facility of Budapest Neutron Center, scientists confirmed that doping does not significantly alter the local structure, preserving the YO_8 and PO_4 building units essential for efficient light emission.

These insights not only advance the understanding of rare-earth-doped phosphates, but also point toward customisable, high-performance materials for next-generation photonic technologies.

"We have shown, characterising the local structure of host compound, how YPO_4 can be transformed into a versatile light emitter through doping with rare-earth ions."

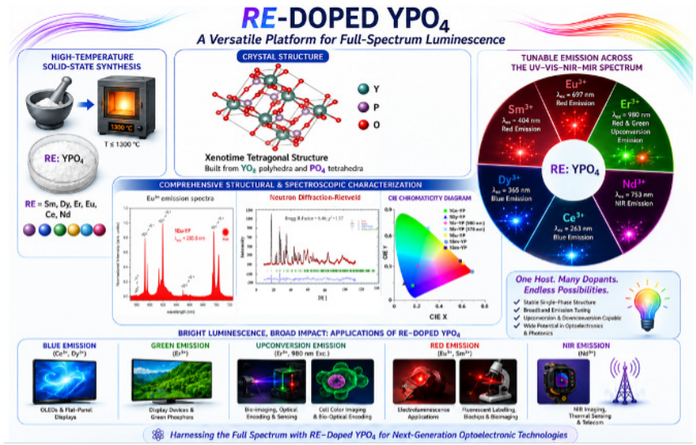


Figure 17
Structure-property correlation studies in rare earth ion doped YPO_4.

[14] **Structural and photoluminescence properties of Sm, Dy, Er, Eu, Ce and Nd ions doped YPO4**, Sharma S., Khanna A., Fabian M., González-Alonso D., Valiente R., González-Barriuso M., González F., Ceramics International, DOI: 10.1016/j.ceramint.2025.04.118

DUAL BEAM IRRADIATION

Targeting Toll-like receptor to Break Stemness in Head and Neck Tumors[15]

BIOLOGY ! HEALTH

Head and neck squamous cell carcinoma (HNSCC) represents a serious clinical challenge, due in part to a resilient subpopulation of cancer stem cells (CSCs) that sustain tumor growth, relapse, and therapy resistance.

Tea Vasiljevic, **Tanja Matijevic Glavan**, **Iva Bozicevic Mihalic** (Ruder Boskovic Institute) and colleagues studied and shed new light on an unexpected actor in this process: Toll-like receptor 3 (TLR3), traditionally known for its role in antiviral immunity. In fact, rather than simply triggering tumor cell death, TLR3 activation appears to promote malignant behavior: scientists demonstrated that TLR3 enhances “stemness” in HNSCC cells, boosting tumor sphere formation, epithelial-to-mesenchymal transition, and the expression of stem cell markers. This effect is tightly linked to the release of damage-associated molecular patterns (DAMPs), endogenous signals that reshape the tumor microenvironment, fostering inflammation, migration, and further CSC activation.

Then, inhibiting DAMP signaling using common medication, such as aspirin and metformin, disrupts some of these processes, interrupting tumor cells migration. To further enhance the treatment efficacy, researchers combined – using dual ion beam microprobe (DuMi) available at the CERIC Croatian Partner Facility – drugs with ion irradiation: while conventional γ-irradiation showed limited efficacy against CSCs, proton therapy emerged as a promising alternative. When combined with a TLR3 agonist and aspirin, proton irradiation effectively eradicated tumor spheres, highlighting a potential path to overcome resistance.

These results highlight the importance of TLR3 in cancer biology and underscore the therapeutic potential of integrating drug-based immunomodulation with advanced radiation modalities.

Tanja M. Glavan

Iva B. Mihalic

“We have shown the potent synergy between aspirin, TLR3 activation, and proton irradiation for eradicating cancer stem cells, noting that proton therapy significantly outperforms gamma radiation.”

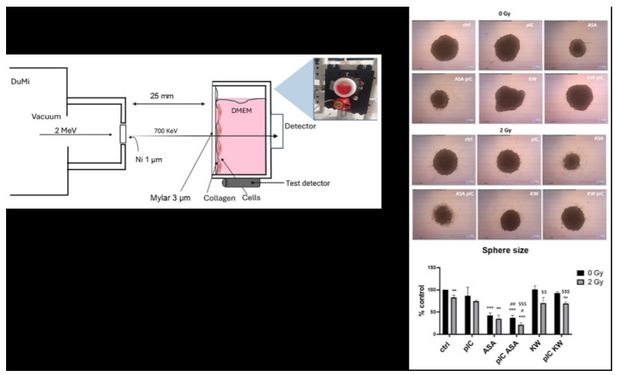


Figure 18
Proton irradiation experimental setup and the effect of TLR3 agonist poly (I:C) (pIC) and aspirin (ASA) on tumor sphere size and survival.

[15] **Targeting DAMPs by Aspirin Inhibits Head and Neck Cancer Stem Cells and Stimulates Radio-Sensitization to Proton Therapy**, Vasiljevic T., Zapletal E., Tarle M., Bozicevic Mihalic I., Gouasmia S., Provatas G., Vukovic Djerfi K., Müller D., Hat K., Luksic I., Matijevic Glavan T., Cancers, DOI: 10.3390/cancers17132157

NMR SPECTROSCOPY

Highlights from CERIC PhDs

New insights on the effect of oxidative stress on DNA[16]

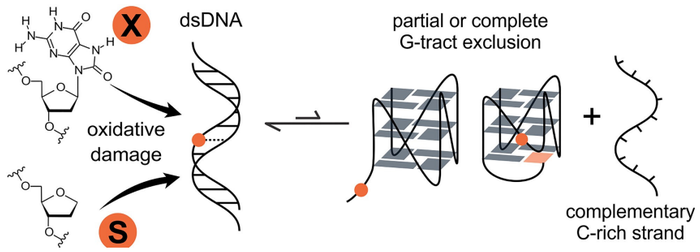
BIOLOGY | GENOMICS

In certain contexts, DNA – especially in guanine-rich regions – can twist itself into entirely different architectures such as G-quadruplexes (G4s), four-stranded structures stabilized by planar arrangements of guanine bases, called G-quartets. G4s can play essential roles in gene regulation processes, but may also have a role in one of DNA's greatest challenges: oxidative damage.


Simon Aleksič


Peter Podbevšek

Guanine is unique among DNA bases because it combines two properties of particular biological importance; its ability to associate into G-quartets and G4 structures, and its high susceptibility to oxidation. The interplay between these two features is crucial for genome stability and regulation. Under oxidative stress, guanine can be converted into 8-oxoguanine and later enzymatically cleaved, yielding abasic sites. The structural and functional outcome of these modifications depends strongly on their position within a G4-forming sequence: at some sites, the damaged base can still participate in the planar G-quartet, whereas at others it disrupts G4 folding entirely, shifting the equilibrium between duplex DNA and G-quadruplex structures. Interestingly, many regulatory DNA regions contain "backup" G-tracts that enable damaged guanines to be bypassed, thus helping preserve the G4 fold even under oxidative conditions. To better understand how oxidative damage destabilizes duplex DNA while promoting G-quadruplex formation, CERIC PhD student **Simon Aleksič**, his supervisor Dr **Peter Podbevšek**, and Prof. **Janez Plavec** investigated model systems consisting of a G-rich strand with an incorporated oxidized lesion, and its complementary C-rich strand. Using the DAVID, ASKA, and LARA spectrometers at the SloNMR, CERIC Slovenian



Partner Facility, they showed that G4 structures could still form thanks to the presence of backup G-tracts. However, most of these structures represented kinetically trapped intermediates – sufficiently stable to persist transiently, but not necessarily the thermodynamically preferred state compared to duplex DNA.

By uncovering how G4s respond to oxidative damage – and how backup G-tracts rescue their function – scientists gain new insights into how cells and their biomacromolecular constituents face oxidative stress.

"Oxidative DNA lesions in G-rich strands destabilise the double helix and kinetically trap G-quadruplexes, rescued by spare G-tracts, but dsDNA remains the thermodynamic equilibrium state.".

Figure 19
Incorporation of oxidized lesions into a dsDNA model system promotes formation of kinetically-trapped G-quadruplexes. [from Aleksič S. et al. (2025) Nucleic Acids Research 53(6)].


Janez Plavec

[16] **Nanoscale Oxidative events in a double helix system promote the formation of kinetically trapped G-quadruplexes**, Aleksič S., Podbevšek P., Plavec J., Nucleic Acids Research, 2025, DOI: https://doi.org/10.1093/nar/gkaf260

X-RAY SPECTROSCOPY, SCANNING ELECTRON MICROSCOPY

The hidden dynamics of platinum-nickel alloys revealed[17]

ENERGY | FUEL CELLS

Platinum-based alloys such as Pt_3Ni have long been central for fuel cell technology, thanks to their superior catalytic activity in the oxygen reduction reaction. Traditionally, their performance boost over pure platinum has been explained by two key factors, ligand and strain effects, which tune the electronic structure of surface Pt atoms and optimize how reaction intermediates bind. However, Pt_3Ni nanoparticles are not static entities under operating conditions, but their structure evolves in response to the applied electrochemical potential.


Hassan Javed


Rik V. Mom

To deeply study this phenomenon, **Hassan Javed** and **Rik V. Mom** (Leiden University), CERIC PhD **Athira Lekshmi Mohandas Sandhya**, **Ivan Khalakhan** (Charles University Prague), and other colleagues used advanced characterisation techniques, such as Energy Dispersive X-ray Spectroscopy and Scanning Electron Microscopy, available at the CERIC Czech Partner Facility. Then, exploiting electrochemical X-ray photoelectron spectroscopy (XPS) at the near ambient pressure end station B-07C at Diamond Light Source (UK), researchers observed that while a platinum-rich shell consistently surrounds the alloy core due to initial nickel leaching, its thickness is not fixed: nickel atoms can migrate within the particle, thinning or thickening the Pt shell depending on the electrochemical environment. This restructuring is driven by interactions between electron-withdrawing adsorbates on the Pt shell and the subsurface Ni atoms, involving charge transfer processes that polarize the Ni atoms to a δ+ state. This dynamic migration occurs on remarkably short timescales, with Ni atoms relocating over several atomic spaces in a matter of minutes. Moreover, scientists proved that even subtle shifts in shell thickness significantly impact catalytic performance, modulating the hydrogen evolution reaction (HER) activity by over 30%.

These results suggest that the design of the next-generation high-performance electrocatalysts should then move beyond static models and embrace the responsive and adaptive nature of alloy systems, incorporating in situ restructuring as a critical design parameter.

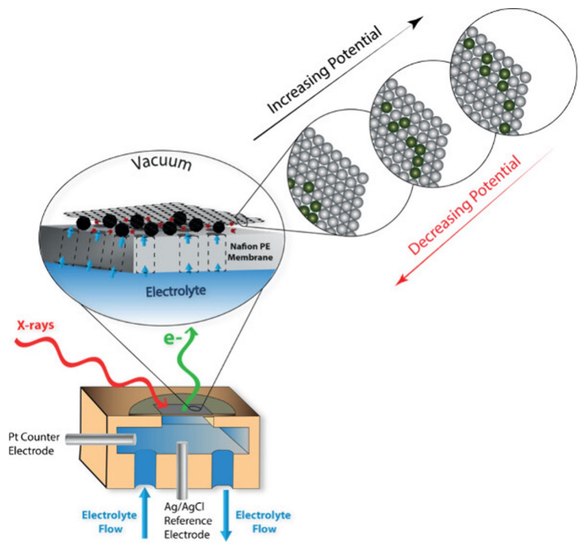


Figure 20
Reversibile potential-driven Ni migration in Pt3Ni nanoparticles probed by electrochemical XPS.

"Using electrochemical XPS on graphene-covered MEAs, we revealed potential-dependent Ni migration in Pt_3Ni alloys, which modifies the Pt shell thickness and significantly influences catalytic activity, offering important insights for electrocatalyst design."


Athira Lekshmi
Mohandas Sandhya

[17] **The Potential-Dependent Structure of Pt3Ni Alloy Electrocatalysts and Its Effect on Electrocatalytic Activity,** Javed H., Kolmeijer K., Deka N., van Spronsen M.A., van Huis M.A., Mohandas Sandhya A.L., Khalakhan I., Mom R.V., ACS Catalysis, DOI: 10.1021/acscatal.5c02601

HIGH RESOLUTION TRANSMISSION ELECTRON MICROSCOPY

Here's how layered ferroelectrics enable negative capacitance[18]

MATERIALS SCIENCE | FERROELECTRICS

Ferroelectric materials, which are known for their switchable polarization, have long been at the centre of non-volatile memory technologies. Yet, beyond their established applications lies a more elusive and intriguing phenomenon: negative capacitance (NC). Predicted decades ago, NC emerges from an unstable region in the energy landscape of ferroelectrics, where polarization and electric field evolve in opposite directions. Fully understanding and exploiting this effect could revolutionise low-power electronics by overcoming fundamental limits in transistor efficiency.

Andra Georgia Boni

Cristian Radu

Andra Georgia Boni, CERIC Phd **Cristian Radu** and colleagues of the National Institute of Materials Physics (NIMP, Bucharest) found an elegant approach to stabilising negative capacitance using multilayer ferroelectric structures. Rather than combining dissimilar materials, the researchers engineered and characterise (using different techniques, such as high resolution transmission electron microscopy available at the CERIC Romanian Partner Facility) bilayers of lead zirconate titanate with slight differences introduced through controlled doping, such as Fe-, Nb-, and Bi-doped variants. These small variations in polarization between layers generate internal electric fields, which can push one layer into the elusive NC regime without requiring external bias. Compared to traditional ferroelectric-dielectric stacks, this bilayer approach reduces damaging depolarisation effects, making the NC state more robust.

These findings offer a promising pathway toward next-generation electronic devices, where internal material design enables unprecedented control over energy efficiency.

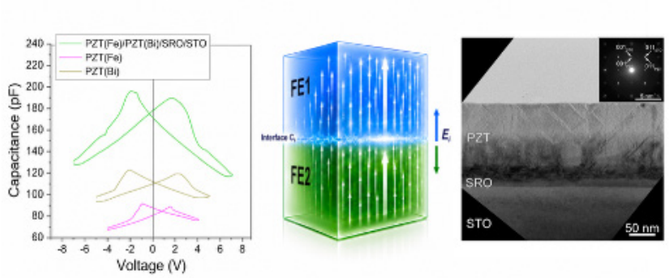


Figure 21
Capacitance amplification in FE bilayers: electrical response, FE bilayer model, and TEM structural characterization.

"Capacitance enhancement via negative capacitance is shown in bilayer ferroelectrics, where small polarization mismatch and interface effects stabilize ferroelectricity over broad temperature ranges."

[18] **Steady state negative capacitance in p-n ferroelectric junctions**, Boni A.G., Chirila C.F., Filip L.D., Botea M.I., Radu C., Popescu D.G., Husanu M.A., Hrib L., Trupina L., Pintilie I., Acta Materialia, DOI: 10.1016/j.actamat.2025.121177

Externally-funded projects

In 2025, CERIC has been involved has been involved in a number of international projects, ranging from those of a purely scientific nature – with the direct participation of one or more of its facilities – to those aimed at enhancing cooperation, training and the exchange of knowledge between institutions, research infrastructures and other ERICs. In particular, one EU funded project (ACTNXT) kicked off, while the Horizon Europe (HE) projects ReMade@ARI, IMPRESS, ERA_Shuttle, ERIC Forum 2 and OSCARS, as well as the Marie Skłodowska-Curie Action project OPVStability, continued to be implemented throughout the year.

HE project - REcyclable MAterials DEvelopment at Analytical Research Infrastructures (ReMade@ARI)

The ReMade@ARI (REcyclable MAterials DEvelopment at Analytical Research Infrastructures) European-funded project provides scientists working on the design of new recyclable materials with analytical tools that enable them to explore the properties and the structure of their material in smallest details up to atomic resolution. The project commits to leverage the development of innovative, sustainable materials for key components in the most diverse sectors, such as electronics, batteries, vehicles, construction, packaging, plastics, textiles and food on an unprecedented level. It represents the central hub in Europe for all sectors and research areas in which new materials for a circular economy will be developed. Within this framework, CERIC participates in the initiative with the Partner Facilities hosted at the following Institutions: National Institute of Materials Physics, National Synchrotron Radiation Centre SOLARIS, Slovenian Nuclear Magnetic Resonance Centre, Charles University in Prague CUP. Specifically, during 2025, the above-mentioned facilities hosted both Transnational Access (TNA) and Small and Medium Enterprise (SME) proposals, reaching a total of approximately 1000 hours of access provided to ReMade@ARI users.

HE project - Interoperable electron Microscopy Platform for advanced RESearch and Services (IMPRESS)

IMPRESS (Interoperable electron Microscopy Platform for Advanced RESearch and Services) is a European-funded project, which aims at designing and delivering cutting-edge Transmission Electron Microscopy (TEM) instrumentation, thanks to a close collaboration between scientists, companies, experts in the field of electron microscopy and RIs. The core principle of IMPRESS is the development of an interoperable platform based on modular, standardised and interchangeable components, which will facilitate a wide range of multimodal experiments, correlative workflows and methodological options (currently not available on commercially accessible electron microscopes). During 2025, the EU IMPRESS project undergone some revisions in order to reflect the need to adapt to new design, development, implementation, and testing approaches, which led to the transitioning from the Pre-Commercial Procurement (PCP) model to a more flexible subcontracting approach. Over the past year, CERIC has continued its support for the Work Package dedicated to Communication and Dissemination (WP7), with a particular focus on training. In particular, a four-day School for 20 early-career researchers has been organised and held, in May, at the ALBA Synchrotron (Barcelona)/ The School offered an immersive learning experience to explore advanced operando and correlative techniques, combining in-depth lectures by renowned experts with hands-on training at state-of-the-art beamlines and laboratories.

HE project - Accelerating ERA by Sharing Unique Talents for healThy Life and Environment (ERA_Shuttle)

The Accelerating ERA by Sharing Unique Talents for healThy Life and Environment (ERA_Shuttle) project aims to establish a cross-sectoral framework that enables collaboration and creates opportunities for talents from diverse backgrounds to address contemporary health and environmental challenges, ultimately delivering innovative solutions for the benefit of society. A key objective is to foster Research and Innovation capacity in the ERA to benefit the participating widening countries Poland, Croatia, and Malta. Within this context, in 2025 CERIC hosted a secondee from the University of Malta, Elena Sultana, at its headquarters in Trieste, within the User Office department. In addition, the CERIC Italian Partner Facility at Elettra Sincrotrone Trieste the Romanian Partner Facility at the National Institute of Materials Physics hosted two further secondments, which activity focused on scientific research. These initiatives contributed to reducing existing barriers and fostering a shared approach to common challenges, by offering training and mobility opportunities that promote diversity and facilitate knowledge exchange across the ERA. CERIC was also involved in several complementary project activities, including participation in the project Summer School, held at the University of Gdańsk, with three lectures on data management, collaboration between academia and industry, and science communication. Furthermore, it contributed to policy-oriented initiatives such as the ERA Act consultation, addressing long-standing challenges in the EU research and innovation system, including fragmented regulatory frameworks, disparities in R&D investment, and barriers to researcher mobility and knowledge sharing. Finally, in terms of communication and dissemination, CERIC supported the relevant Work Package by developing multimedia and graphic content to promote the project across its social media channels.

HE project - Second implementation project for the ERIC Forum (ERIC Forum 2)

The ERIC Forum 2 project, funded by the European Commission, aims to develop a platform for collecting data and documentation about ERICs, work on implementing the ERIC Regulation, and enhance the ERIC community and its representatives' voice. CERIC's contribution spans multiple areas. The Consortium has continued its preliminary work on a possible European employment contract, developing extensive documentation on competence frameworks for the various areas of expertise, drawing on the informational materials produced by the European Union on the subject. It has also organised several high-level webinars to engage with the inherent diversity of the ERIC community and present examples from international research infrastructures. CERIC has furthermore committed to taking the lead on Work Package 8, dedicated to digitalisation and green transition. Finally, it has continued its work within the working group on the ERIC Regulation, fostering opportunities for exchange and study within the Forum community. With regard to communications, CERIC has continued to manage its main communication channels (newsletter, website, and social media), focusing its efforts on collaboration with other working teams for the graphic production of promotional materials for ERICs. It is also collaborating with Work Package 2 on the communication aspects of the reporting platform, which is currently under development.

HE project - Open Science Action for Research & Society (OSCARS)

CERIC contributes to the OSCARS (Open Science Clusters' Action for Research and Society) project, funded by the European Commission, which aims to foster the uptake of Open Science in Europe by advancing and further integrating FAIR research data and cross-disciplinary services within the European Open Science Cloud (EOSC).
Through close collaboration among Research Infrastructures within the five EOSC Science Clusters, and by supporting small-scale Open Science projects and services via cascading grants, OSCARS promotes the adoption of FAIR and Open Science practices across diverse scientific domains.
Within this framework, CERIC plays an active role in Work Package 4 (WP4) – Management, Communication and Open Calls. This work package oversees the design, publication, and implementation of the two OSCARS Open Calls, which led to the selection of 70 cross-RI and/or cross-domain Open Science projects and services. It also contributes to the onboarding of project outputs, including data and results, into the EOSC ecosystem.
CERIC has contributed to the promotion of the Open Calls and the funded projects, highlighting their Open Science challenges and proposed solutions across a wide range of digital and more traditional communication channels, and supporting the collection and analysis of their results and impacts for further dissemination during the second half of the project.
Furthermore, CERIC supports communication and dissemination activities across OSCARS, contributing to the visibility of achievements generated by the Science Clusters across all work packages.

HE project - Advanced Characterization of Technical Components for New Power-to-X Technologies (ACTNXT)

The HORIZON-INFRA-2024-TECH-01 ACTNXT (Advanced Characterization of Technical Components for New Power-to-X Technologies) project commenced in 2025, with the primary goal of advancing Power-to-X (PtX) technologies through the upgrade of neutron and synchrotron research infrastructures across Europe. CERIC participates in the project along with its Partner Facilities hosted at Charles University in Prague and the Technology University in Graz, leading Work Package 3 - "Materials under hydrogen exposure", with the main objective to develop specialized instrumentation necessary to perform in-situ studies of materials exposed to hydrogen in different pressure and temperature environments. The instrumentation should enable new pathways for investigating critical challenges associated with the development of PtX components, such as hydrogen embrittlement, high temperature hydrogen attack, and hydrogen permeability. Moreover, CERIC support communication and dissemination activities of the Project.

MSCA project - Understanding, Predicting and Enhancing the Stability of Organic Photovoltaics (OPVStability)

The OPVStability (Understanding, Predicting and Enhancing the Stability of Organic Photovoltaics) Marie Skłodowska-Curie Actions Doctoral Network (MSCA-DN) is an interdisciplinary research training network of ten beneficiary universities from seven countries. Funded under the Excellent Science cluster of the Horizon Europe programme, the project supports the research of ten PhD candidates investigating stability and degradation mechanisms in organic photovoltaics.
In 2025, CERIC researcher Devina Gupta continued her training path, taking part in the workshop organised by industrial partner InfinityPV, the Quantsol Winter School 2025, as well as the training sessions included in the progress meetings held by the project at the Johannes Kepler University and at the Karlstad University. In collaboration with CERIC's communications office, she also took part in the dissemination activities organised at the Trieste Next festival.

Figure 22
Devina Gupta at the workshop organised by the industrial partner InfinityPV for the OPVStability project.

2

Developing and strengthening CERIC's portfolio

Since its establishment, CERIC has pursued the strategic development of its infrastructure, with a continuous focus on integrating national multidisciplinary PFs into a single EU-level distributed Research Infrastructure (RI). This integration represents a core priority of the Consortium, enabling the effective sharing of resources, expertise, and data across national boundaries, and thereby strengthening research capacity, efficiency, and scientific impact at the European level.

In accordance with the directives of the General Assembly, CERIC has implemented a structured programme of activities aimed at supporting transnational joint research projects, enhancing the professional competencies of PF staff, and upgrading key infrastructure components. These actions have been partially financed through annual ordinary contributions provided by the Italian Ministry for University and Research. Moreover, following the introduction of the revised CERIC funding model in 2024 - based on annual membership fees coming from Member Countries - additional financial resources have been mobilised. These funds have been strategically allocated to further advance infrastructure capabilities and to reinforce human resources through the recruitment of scientific and technical personnel across the PFs.

The following section provides an overview of the principal activities carried out, outlining the specific contributions and key achievements associated with each Member Country.

Main Achievements in 2025

1. **Infrastructure upgrade: New accelerators under construction at the Austrian, Croatian and Italian PFs; secured funding for the CUBES beamline at the Czech PF; equipment upgrade at the Polish, Romanian and Slovenian PFs, and at the JRC AF.**
2. **New instruments added to the CERIC open access offer: TomoLab-offline, TeraFermi online and offline (Italian PF), Microfabrication Laboratory (Austrian PF), 600 MHz NMR spectrometer (Slovenian PF).**
3. **Five projects funded via the CERIC Call for Expression of Interest started in 2025.**

AUSTRIA

In July 2025, the Austrian Partner Facility shut down user activities at Elettra Sincrotrone Trieste, due to the planned decommissioning of the storage ring, after a full period of proposals at the SAXS and the Deep X-ray Lithography beamlines. By 15th August 2025 the whole Austrian SAXS beamline was disassembled.

In parallel, for the internal project HF-SAXS beamline, the main components of the new beamline (monochromator, mirror, mirror chamber, slits) have been specified and the missing parts have been purchased within the project HF-SAXS 2.0. Overall, the project is on track with the projected timeline and will be complemented by in kind contributions from Elettra and TU Graz. Meanwhile, Microfabrication Laboratory has been made available to users: the lab, which has a special focus on microfluidics and micro components production, offers a pool of instruments to perform standard microfabrication processes based on UV-lithography and/or PDMS casting.

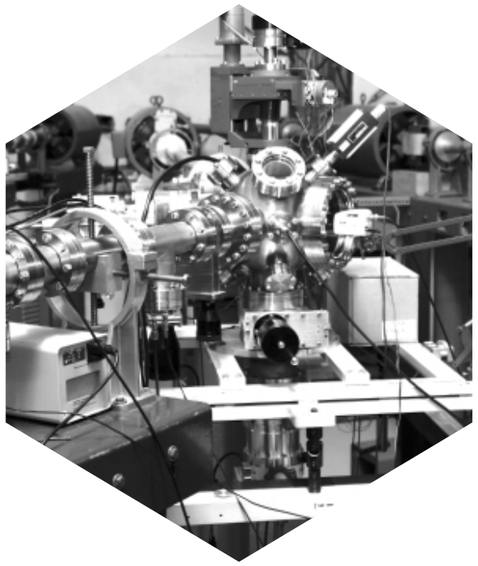
For the ACTNXT project, the activity of the design of the hydrogen attack GISAXS cell has been started and the report regarding its operational parameters has been delivered.

The user access to the scattering techniques (SAXS & DLS) at the TU Graz has been improved by an upgrade of the SAXS station from a SAXSpoint 2.0 to a SAXSpoint 700 instrument (Anton Paar, Austria). Scattering data are collected on an Eiger 1M detector (Dectris, Switzerland) automatically positioned at different sample-to-detector distances between 73 - 1629 mm covering the full SWAXS regime from 0.028 nm-1 to 32 nm-1. The instrument uses a microfocused, monochromatized X-ray source Cu Kα (λ = 0.154 nm). For the users, several cells are available, such as SAXS & GISAXS, environmental cells, high temperatures cells, batteries, air set-ups, etc. An important improvement is the availability of Python scripts for instrument control, enabling full control of the data acquisition strategy. Moreover, the resulting data are processed and background-subtracted using the DAWN software package, following standardized data-correction procedures, within a fully automated data pipeline that outputs results in standard NeXus format.

The Austrian Partner Facility participates at the international Hercules school since 2021 and a part of the staff is actively involved in the CERIC project PaGES for hands- on experiments of high school students, since 2020. Moreover, the School on Synchrotron Radiation Applications is organised every year, since 2012, by TU Graz and Montan University of Leoben, and the 2025 edition took place at Elettra.

TECHNIQUES AVAILABLE
Microfabrication Laboratory, Laboratory SWAXS and Dynamic Light Scattering (DLS).

RESEARCH DOMAINS
Chemistry, physics, biological sciences, life sciences, materials science.



CROATIA

In 2025, the Croatian Partner Facility at the Ruđer Bošković Institute (Zagreb) entered a major phase of enhancement and modernization, focused on expanding technical capabilities and improving user access. In particular, within the framework of the EXIT Expression of Interest (EoI) internal initiative (“Beam line for the EXternal Ion microbeam Techniques”) key components were successfully procured, contributing to the main objective of the project: the construction of a state-of-the-art system that will be based on scanning microbeam with the smallest possible spatial resolution in air and highest possible solid angle detectors for PIXE and PIGE analysis techniques. In parallel, the Triple I (“200 kV Ion Implanter Instrumentation”) EoI project also progressed through several major procurements, including the acquisition of the ion source and a 4D piezo stage for sample manipulation.

Furthermore, during the first year of the project, the digital control system for the implanter was established, and the magnet power supply was successfully tested using the existing implanter setup.

Additionally, the Croatian Science Foundation project HRZZ IPCH-2024-10-5444, launched in July 2025, supports the development of advanced ion implantation techniques and complements the Triple I upgrade.

Within the EU Infrastructure O-ZIP project, a new accelerator building is under construction, where the new 5 MV Tandetron - delivered in December 2025 - will replace the current 6 MV system. Despite construction delays, full operation is expected by the end of 2026. Moreover, in 2025 RBI initiated the implementation of the membership fee as an additional contribution aimed at supporting actions that enhance and integrate the capabilities of CERIC Partner Facilities. In this context, SF6 insulating gas was procured, which is essential for the operation of the 5 MV accelerator.

Looking ahead, increased collaboration is expected through the “Optimization of operation and use of the RBI Tandem Accelerator Research Infrastructure (OTARI)” project. By the end of 2026, the Facility will offer higher beam energies and currents, a new beamline for in-air micro-PIXE and RBS, and enhanced low-energy implantation capabilities (Triple I), significantly improving services for CERIC users.

TECHNIQUES AVAILABLE
Dual Beam Irradiation Station, Ion Beam Channeling , MeV Time-of-flight (ToF) Secondary Ion Mass Spectrometry, Nuclear Microprobe, Detector Testing, Particle-Inducted X-ray Emission, Rutherford Backscattering, ToF Elastic Recoil Detection Analysis.

RESEARCH DOMAINS
Material physics, semiconductors, batteries thin films, elemental analysis, microimaging, Radiation detectors and dosimetry, Molecular imaging, materials physics, nuclear fusion and fission, Ion beam implantation and materials modification, biomedicine.

CZECH REPUBLIC

In 2025, the Czech Partner Facility at Surface Physics Laboratory – Hydrogen Technology Center (SPL-HTC, Charles University Prague) continued to provide access to its research infrastructure within CERIC-ERIC, supporting research in materials science, catalysis, electrochemistry, hydrogen technologies, and surface analysis. User activity reached its highest level to date, with 115 users applying for access and 98 experiments completed. In 2025, users published 38 peer-reviewed papers, while data obtained at SPL-HTC contributed to 7 defended PhD theses and 1 Master’s thesis. Moreover, a CERIC PhD Scholarship linked to the EoI scheme was also awarded for research on catalysts for AEM water electrolysis.

A major milestone in 2025 was the shutdown of the Materials Science Beamline (MSB) in July as part of the Elettra 2.0 upgrade. Despite this, SPL-HTC maintained a high level of user access and scientific output through its laboratory-based instrumentation (XPS/XPD, NAP-XPS, EnviroESCA, FE-SEM, FIB/SEM) and the Hydrogen Technology Center.

Regarding in-house research, within the framework of the AEMWE EoI internal project, the personnel selection process was completed and a PhD candidate was recruited: the objective of the dissertation thesis is to build on the prospective results of the SPL-HTC RI, predominantly in the area of novel catalysts for the oxygen evolution reaction.

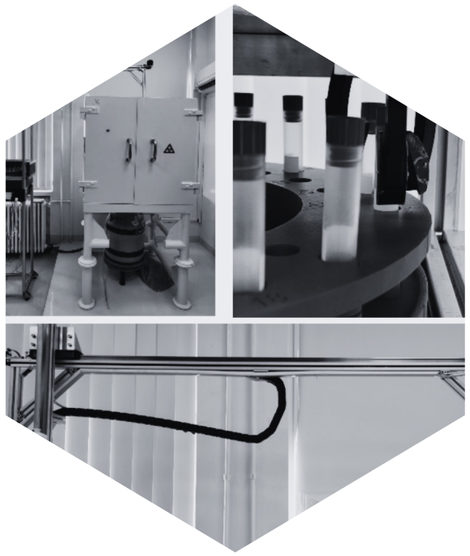
In terms of infrastructure development, SPL-HTC secured funding for the future CUBES beamline and for a high-pressure cell for hydrogen embrittlement studies through the EU-funded ACTNXT project (to which the Facility contributes in Work Package 3, “Materials under hydrogen exposure”). Additional upgrades of EnviroESCA, NAP-XPS, and HTC were completed through the OP JAK MI SPL-HTC project. New operando electrochemical half-cells for acidic and alkaline environments, as well as an operando liquid cell, were introduced and commissioned. The Fuel Cell testing laboratory was relocated to new premises, and a new Support Lab was opened in the second half of 2025.

Within the framework of the EU ReMade@ARI project, in which Charles University in Prague participates by providing access to its EnviroESCA instrumentation, the Facility received a request under the ReMade@ARI Transnational Access (TNA) scheme and carried out the related experimental activities. The proposal, focused on structure–activity relationships in perovskite ferrite CO_2 hydrogenation catalysts, was successfully completed in October 2025.

SPL-HTC will now focus on the development of the CUBES beamline. Moreover, in summer 2026, FTIR is expected to be integrated into the NAP-XPS system, expanding the Czech PF open-access offer with a new multimodal platform combining NAP-XPS, FTIR, and AP-STM.

TECHNIQUES AVAILABLE
Materials Science Beamline (offline), XPS/ XPD, NAP-XPS, and EnviroESCA spectrometers, FE-SEM and LYRA FIB/ SEM microscopes and the HTC devices - half cells and single cells of the water electrolyser (WE) and hydrogen fuel cells.

RESEARCH DOMAINS
Surface science, materials science, catalysis, physical chemistry, Biophysics, Sensors, energy materials, electrochemistry, hydrogen technology.



HUNGARY

The Regarding the Hungarian Partner Facility at the Budapest Neutron Centre (BNC), the Budapest Research Reactor (BRR) resumed regular operation in the second half of 2025, carrying out four 96-hour cycles during the autumn period. Additionally, an automated sample changer was implemented in the Neutron Activation Analytical laboratory of BNC: a three-axis Galil-controlled sample changer with 3D-printed tray, lead-shielded frame, integrated mechanics, electronics, and custom software enabling automated sample handling and measurement.

The disassembly of the NEAT inelastic spectrometer was almost completed in 2025, and in 2026 the components of the instrument and its shielding elements will be delivered to Budapest. The installation of the NEAT and modernisation plans for the Cold Measuring Hall have already been prepared. Furthermore, within the framework of the agreement on the use of national membership fees, at the BNC two new postdoctoral positions have been filled by Noémi Buczkó and Szimona Zarzsevszkij.

Finally, the implementation of a new user software system has commenced, and the integration of the instruments into NICOS (Network-Based Control System) will continue in 2026.

TECHNIQUES AVAILABLE
Small angle neutron scattering, Neutron Activation Analysis.

RESEARCH DOMAINS
Structural research of condensed matter at mesoscopic length scales.

ITALY

At the Italian Partner Facility at Elettra Sincrotrone Trieste, the first semester of 2025 was fully dedicated to users, both online and offline. In July 2025 the Elettra storage ring was shut down and the decommissioning started. With respect to 2024, 3 new instruments have been added to the scientific offer: TomoLab-offline, TeraFERMI-online and TeraFERMI-offline.

The Italian PF is involved, as coordinator, in 4 projects from the 2022 “Expression of Interest” call: ESBY (Electron microscopy for Structural BiologY at CERIC-ERIC) successfully came to its end with the purchase and commissioning of the new instrumentation; STEAMS (multiscale TErAhertz iMaging) was successfully completed and the laboratory was visited by the ISTAC in May 2025; BatERIC (CERIC-ERIC for Battery Research), dedicated to the management and personnel training activities for the new battery laboratory, kicked-off in 2025 and is running smoothly; FAITH (Flexible Apparatus for Imaging and TomograpHy), started in 2025 with instrumentation acquisition and personnel hiring.

The Italian PF also contributed to the PathCHIP@CERIC Expression of Interest project (“Advanced bio-inspired multiplexing platform for host-pathogen interaction screening”), for which a researcher operating within both the Joint Research Centre (JRC) and Elettra’s laboratories (NanoInnovation and SISSI-Bio) was recruited in 2025.
The Italian PF is also Affiliated Entity in the HE “ERA SHUTTLE - Accelerating ERA by Sharing Unique Talents for healThy Life and Environment” project: in 2025 it hosted for 6 months a researcher from the University of Gdansk in the TomoLab laboratory with the main objective of acquiring advanced, hands-on expertise in X-ray micro-CT at TomoLab, including data acquisition, calibration, reconstruction, and quality assurance/quality control, as well as gaining a comprehensive understanding of the instrument’s operational regime.

Finally, in 2025 the Agreement for the Membership Fees was updated and signed by the Parties to support development of scientific instrumentation for the benefit of all CERIC-ERIC users.

Looking ahead, all scientific, technical and administrative personnel are highly committed to completing the Elettra 2.0 upgrade plan, which is expected to deliver the first light of the new diffraction limited machine in early 2027. In the meantime, offline facilities and the TeraFERMI beamline at FERMI will keep attracting users from all over the world to perform their research in Trieste.

TECHNIQUES AVAILABLE
Inelastic ultraviolet scattering (offline), infrared spectroscopy and imaging (offline), X-ray computed tomography, Free-Electron-Laser THz beamline.

RESEARCH DOMAINS
Materials science, surface science, solid-state chemistry, atomic and molecular physics, biology, medicine, cultural heritage.

POLAND

In 2025, the CERIC Polish Partner Facility hosted at National Synchrotron Radiation Centre SOLARIS (Kraków) achieved significant progress in both operational capabilities and scientific output. A major milestone was the official opening of the CIRI beamline to users, enabling the delivery of infrared photons from the 1.5 GeV storage ring to advanced FT-IR and sSNOM/AFM-IR end stations. This development expanded the facility's analytical potential, particularly in the study of materials at micro- and nanoscale resolution, and the beamline will be accessible to CERIC users from 2026. To further strengthen its research infrastructure, the cryo-electron microscope was upgraded with a cutting-edge detector system. This enhancement dramatically increased data acquisition efficiency, allowing the collection of up to 850 movies per hour and significantly improving throughput and resolution in structural biology studies.

Throughout the year, SOLARIS also played an active role in international scientific collaboration: within the framework of the ReMade@ARI project, in 2025 the Polish PF successfully hosted and conducted a series of experiments, confirming its reliability and attractiveness as a research hub. In parallel, the EoI CECOMEC project - focused on optimizing ceria-based compounds for electrochemical applications - was carried out in cooperation with the POLYX beamline team, the CNR – Istituto Officina dei Materiali, and Gdansk University of Technology. In particular, SOLARIS contributed by performing detailed morphological characterization of newly developed samples using micro-XRF techniques, complementing initial analyses conducted by project partners.

Looking ahead, several new instruments are currently under development, including the SMAUG beamline with a bio-SAXS end station and the ARYA beamline dedicated to macromolecular crystallography, as well as new experimental stations such as NAP-XPS at PHELIX and Operando XAS at POLYX. Another key initiative is the construction of the MAVKA beamline, dedicated to micro- and nanospectroscopy, developed within the LEAPS "Light for Ukraine" program. This project has already secured substantial support from the Paul Scherrer Institute and the Swiss government, with additional contributions encouraged.

TECHNIQUES AVAILABLE
Photoemission, spectroscopy, X-ray spectroscopy, X-ray transmission and fluorescence microscopy, X-ray tomography, angle- and spinresolved photoelectron spectroscopy, photoemission spectroscopy and microscopy, cryo-EM.

RESEARCH DOMAINS
Chemistry, physics, biological sciences, materials engineering, geology and earth sciences, paleontology.

ROMANIA

In 2025, the CERIC Romanian Partner Facility at the National Institute of Materials Physics (NIMP, Măgurele) recorded significant progress in both infrastructure development and scientific activity.
The Facility hosted ten CERIC-funded proposals addressing diverse topics such as low-carbon materials, biomedical applications, and energy technologies.

Additionally, participation in European projects continued to foster collaboration and knowledge exchange: within the ERA SHUTTLE project, a researcher from the University of Gdansk completed a three-month secondment, receiving both theoretical and hands-on training in X- and Q-band EPR spectroscopy. This initiative contributed to capacity building and supported the transfer of expertise to the researcher's home institution.
Under the ReMade@ARI project, the facility provided access to its HR-TEM infrastructure for industrial research, including the characterization of silver nanoplatelets developed for heat management applications. These activities highlight the facility's relevance for both academic and applied research.

Central to infrastructure advancements was the implementation of the EoI ARTEMIS project, which aims to modernize and expand high-resolution transmission electron microscopy capabilities: as a first milestone, a new Energy Dispersive X-ray Spectroscopy (EDS) detector with enhanced sensitivity and a larger detection area was successfully installed. This upgrade substantially improves elemental analysis at the nanoscale, enabling more accurate and efficient characterisation of advanced materials. Complementing this development, a nanomanipulator for the SEM-FIB system was procured, marking another key step toward enabling complex in situ experiments and precise nanoscale manipulation under electron and ion beams. While acquired in 2025, its installation is scheduled for 2026, further extending the Facility's experimental capabilities.

Further infrastructure upgrades are planned, subject to funding availability, including advanced EPR systems, a new analytical HRTEM, and additional sample preparation equipment.

TECHNIQUES AVAILABLE
High Resolution Transmission Electron Microscopy, Electron Paramagnetic Resonance.

RESEARCH DOMAINS
Materials Science

SLOVENIA

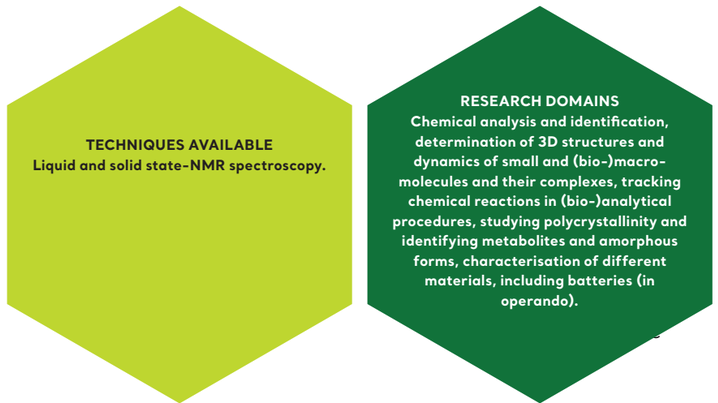
In 2025 the CERIC Slovenian Partner Facility at the National Institute of Chemistry (Ljubljana) upgraded and installed a new DNA/RNA synthesiser that will enable users requiring on-site nucleic acid synthesis for sample preparation to synthesise a greater quantity of NAs more quickly and efficiently. Moreover, a new 600 MHz Nuclear Magnetic Resonance Spectrometer (Bond) became available for CERIC users.

Regarding internal research, in 2025 CERIC-ERIC continued to employ a post-doc researcher, Giuseppe Satta, in the DNANANOCERIC EoI project ("CERIC-ERIC for Research in DNA Nanotechnology"): the researcher recruited in 2024 successfully progressed with implementation activities focused on exploring the structures of long noncoding RNAs (lncRNAs), which play crucial regulatory functions in numerous biological processes, often mediated by intricate structural motifs such as RNA G-quadruplexes (rGQs). In addition, a doctoral student - Matej Gabrijelčič – who has been employed at the Slovenian NMR Centre and was partially funded from CERIC-ERIC funds, completed his doctoral studies in 2025.

Within the framework of the EU ReMade@ARI project, the Slovenian PF also received several proposals for Transnational Access (TNA) to its NMR instrumentation, and it successfully hosted and supported multiple user projects funded under the ReMade@ARI programme. Moreover, during 2025, the Slovenian Partner Facility initiated the implementation of the membership fee as an additional contribution aimed at supporting actions that integrate and strengthen the capabilities of CERIC PFs. In this context, a research project was launched focusing on the structural mechanisms underlying osteoporosis, with particular emphasis on investigating whether and how non-canonical DNA/RNA structures formed within promoter regions and 5'-UTRs influence the expression of osteoporosis-related genes. As part of this initiative, a dedicated human resource, Elisa De Piante, was recruited at the end of 2025.

Finally, the Facility's staff participated to the Interaction Wins 2025's winter school, where we had the opportunity to promote CERIC and explain its purpose and access methods during an NMR lecture and four hands-on NMR demonstrations. The NMR practical session provided students with a hands-on experience of the application of NMR, with a particular focus on the underlying principles and practical uses of the technique.

Looking ahead, the medium-term plan includes purchasing a 1 GHz spectrometer with a cold probe and replacing the existing 800 MHz spectrometer (David) with a new 800 MHz spectrometer for liquid-state measurements. Another commitment of our Slovenian NMR Centre is the training and recruitment of new personnel. The NMR Centre currently employs 20 highly qualified researchers and experts in the field of NMR spectroscopy. Their knowledge and expertise enable them to solve a wide range of professional problems for users. We are aiming to expand our team in the future, but this represents a substantial challenge in the current job market.



Enhancing PFs' capabilities through Internal Projects

Among the many initiatives CERIC has undertaken to improve the operational capabilities of its PFs (in terms of both infrastructure and staff enhancement), the Expression of Interest (EoI) projects stands out for the wide-ranging and significant impact they have at both local and international levels. Such internal projects were organised through an internal call proposed in 2022 by the ED in consultation with the BoD, managed by the ISTAC, with the outcomes approved by CERIC's GA. During 2025, a project (CH-ERIC) had been completed - in addition to the four initiatives completed in 2024 - whilst several others were still being implemented and five new EoI projects had been launched:

PROJECTS COMPLETED IN 2025

CH-ERIC ("CERIC-ERIC for Cultural Heritage Research)
Croatian, Hungarian, Italian, and Slovenian PFs

The CH-ERIC Expression of Interest internal project was designed to further investigate the advantages of the complementary use of multiple analytical techniques available at CERIC in the field of Cultural Heritage (CH), in particular those hosted by Elettra Sincrotrone Trieste, the Budapest Neutron Centre, the Ruđer Bošković Institute and the Slovenian NMR centre. Achieving this objective required the contribution of a highly qualified human resource, capable of promoting and supporting user-driven research in the CH field, acting as mediator between the scientific and humanistic communities, for filling the gap sometimes existing in languages and approaches. To this end, the post-doctoral researcher Chiaramaria Stani was successfully recruited and contributed throughout the implementation of the project.

PROJECTS STARTED IN 2025

BatERIC ("CERIC-ERIC for Battery Research")
Austrian and Italian PFs

The BatERIC Expression of Interest project aims to provide a Human Resource to manage the Battery laboratory: the commitment of the HR will be not only to set-up the new laboratory, but also to provide support to the users and to develop a cutting-edge in-house research program in the field of battery research, which is one of the sustainable development goals adopted by the United Nations.

HF-SAXS 2.0 ("Upgrade of the Austrian SAXS beamline for ELETTRA 2.0")
Austrian and Italian PFs

Due to the ELETTRA 2.0 upgrade in 2025, the Austrian SAXS beamline will be relocated to the free exit port 10.2R of the superconducting wiggler. The reinstallation and refurbishment of the new "high flux beamline" is the central part of this proposal. The new beamline with a fixed energy of 11.4 keV will have smaller spot-sizes, 10 times higher flux density and 3 times higher flux compared to the existing Austrian SAXS beamline. At the same time the SAXS resolution will be improved by a factor of 3. In combination with the highly flexible "high brilliance beamline" – a second planned SAXS beamline – the high flux beamline will be operated in a more standardized and high throughput mode increasing the number of accepted proposals. The science will be focused around life science and energy materials in transmission and grazing incidence mode, but also open to other projects with radiation sensitive samples.

PathChip@CERIC
JRC AF (Ispra), Italian PF

The goal of this project is to join the techniques and expertise available at the CERIC facilities of the Elettra laboratories (NanoInnovation and SISSI-Bio) and the JRC Nanobiotechnology laboratory to develop an advanced platform to study host-pathogens interactions. This platform will enable to a) investigate the interaction mechanisms between Virus Like Particles (VLP) (as surrogate of coronaviruses, influenza viruses, etc) and the membrane receptors expressed in different compartments of our respiratory system, and b) to assess the capacity of therapeutic antibodies to neutralize VLPs through binding to immunoprotective antigens.

FAITH ("Flexible Apparatus for Imaging and TomograpHy")
Hungarian and Italian PFs

The FAITH Expression of Interest internal project ("Flexible Apparatus for Imaging and TomograpHy") was also launched: the goal of the proposal is to increase the scientific offer of the Italian Partner Facility with an upgrade of the microtomography (microCT) off-line instrument and hiring a dedicated resource for the management of this facility. The instrument will serve CERIC users from both the scientific and industrial communities, and the performances of this microCT facility could also be effectively complemented by imaging techniques at Budapest Neutron Centre (BNC).

AEMWE ("Investigation of sputtered thin-layer oxygen evolution electrocatalysts in alkaline media and the effect of structural and electronic properties on the catalytical performance")
Austrian and Czech PFs

Within the AEMWE Expression of Interest internal project the personnel selection process was completed and a PhD candidate was recruited: the objective of the dissertation thesis is to build on the prospective results of the SPL-HTC RI, predominantly in the area of novel catalysts for the oxygen evolution reaction.

3 Upskilling staff at CERIC and beyond

CERIC is committed to promoting scientific excellence by offering extensive training and professional development opportunities for both scientific and technical staff. This chapter underscores CERIC's dedication to fostering talent, strengthening collaborative training initiatives, and motivating future generations of STEM students through a range of programmes and partnerships. These activities include training courses, PhD scholarships, and educational projects, all aimed at enhancing skills, developing competencies, and supporting the professional advancement of early-stage researchers, as well as technical and support personnel.

CERIC also seeks to maintain effective internal and external communication by coordinating communication, promotion and outreach efforts. In this context, the chapter presents a selection of initiatives undertaken to disseminate scientific results not only to the research community, but also to communication professionals and to the broad public.

Main Achievements in 2025

1. **~250 hours of training delivered to CERIC staff**
2. **60+ scientists gathered together for a symposium on Life Sciences**
3. **45 high-school pupils trained during the PaGES 9 project.**
4. **13 CERIC-supported PhD projects completed.**
5. **450+ people engaged via science dissemination events: Trieste Next and Genoa Science Festival.**

HR development of the CERIC staff operating at the Seat

Throughout the year, CERIC has been continuously focusing on the training and professional development of its staff and managers, embracing a philosophy of lifelong learning. In 2025, the CERIC team invested nearly 250 hours in training sessions designed to enhance their skills across a variety of areas, including software development, scientific evaluation in PMS systems, knowledge and technology transfer, risk management and GDPR, human resources, and social media management.

CERIC's symposium on Life Sciences

As part of CERIC-ERIC's ongoing mission to strengthen cutting-edge research in Life Sciences and bring the local research community together, CERIC organised a symposium dedicated to exploring the theme of aging through the lens of advanced structural and molecular techniques. The event was hosted in Warsaw, at the International Institute of Molecular Mechanisms and Machines of the Polish Academy of Sciences (IMol), from the 13th to the 15th of October.

More than 60 scientists from all over Europe, including researchers from all the CERIC Partner and Associated Facilities, participated in an inspiring discussion focused on three aging-related topics: structural biology, muscle-skeletal disorders and neurodegeneration. The symposium featured presentations from scientists utilising state-of-the-art technologies involved in (bio)materials characterisation, such us cryo-electron microscopy (cryo-EM), nuclear magnetic resonance (NMR), small-angle X-ray scattering (SAXS), crystallography, and many more. The symposium revealed the importance of developing and strengthening connections with a diverse user community, which can also provide alternative perspectives through complementary techniques. At the same time, important discussion threads emerged during the three- day meeting, including the importance of support laboratories for sample preparation and pre-characterisation, as well as the increasingly central role played by AI technologies in data processing and interpretation, particularly across different measurements using multiple techniques.

Figure 23 Opening of CERIC's symposium on Life Sciences. Photo Credit: IMol/ Marcin Krokowski.

National Congress on Science Communication

In 2025, the CERIC communications team attended the National Congress on Science Communication. The event addressed some of the most pressing issues in contemporary science communication, offering a multifaceted view of the current priorities and challenges in the field. In particular, CERIC contributions were centred on effective ways to engage and interact with school audiences (with focus on the PaGES project).

Training pupils and early-stage researchers

Training high-school pupils: the PaGES 9 project

The ninth edition of the PaGES project (Planning, Management and Implementation of a scientific experiment in an international RI) took place in 2025, with the primary aim of familiarising young high-school pupils with the essential skills (such as science communication and project management) needed to design, manage, execute, and disseminate the findings of a research project.

Throughout the years, the programme has been combining lectures, virtual tours, and hands-on sessions in a research setting, enabling students to make informed decisions about their future studies and careers. This approach bridges educational phases, fostering lifelong guidance and partnership with the corporate sector.
In 2025, the project received funding from the Friuli Venezia Giulia Regional Authority. This edition

Figure 24
Pupils at work during the experimental activities hold in Elettra Sincrotrone Trieste.

involved four scientific high schools and 45 students, for a total of 20 training hours per school.
The goal was to enhance pupils' understanding of the basic principles and applications of different synchrotron techniques available at CERIC Italian and Austrian Partner Facilities at Elettra Sincrotrone Trieste, such as microfabrication, lithography, as well as Raman and infrared spectroscopy. After the experiment, students prepared, together with their teachers, a scientific report of the performed activities (including data analyses), which they discussed with the three researchers from CERIC, Elettra and TU Graz that have been involved in the project.

Then, as usual, at the end of the project pupils presented their experience, and the scientific experiment they carried out to a wider audience (nearly 400 people) composed of their fellow students and teachers. Besides the researchers, two members of the CERIC staff were involved in PaGES 9, with lectures on project management and science communication. The students also completed a questionnaire in which various aspects of the project - which was generally very well received- were assessed : in particular, over 70% of participants would recommend this type of programme to another student at his/her school in the future, moreover, more than 3/4 of the participants (76%) stated that PaGES contributed to increasing their interest in scientific topics. Furthermore, over one third (34%) of pupils who were already interested in pursuing a STEM-related study career stated that the PaGES project significantly contributed to confirming their choice.

Training PhD students

Starting in 2020, CERIC has provided nineteen PhD scholarships for doctoral programmes in collaboration with thirty institutions: eight CERIC PFs and two AFs, and twenty universities and RIs in Italy and around Europe. Eight research projects are in the Life Sciences domain, five in Energy Research, three in Materials Sciences, and three in other disciplines. As at the end of 2025, fifteen researchers completed their doctoral programme - six in the Life Sciences domain, and the other three in the domains of Energy Research, Cultural Heritage and Materials Sciences, respectively - whereas some of them are expected to defend their PhD thesis by the end of 2026. Throughout the year, researchers also had the opportunity to present their research in fourteen workshops, conferences and events targeting either the scientific community, or the general public. A CERIC-supported PhD candidate also received, during one of such events - the “Doctoral Dialogues in Physics”, organised at the Faculty of Physics of the University of Bucharest, October 2025 – the "Best Presentation Award" for her speech, focused on TEM characterisation of nanostructured materials for gas sensing. Finally, on the basis of the feedback collected from PhD grantees, 15 papers involving them and directly linked to their research topic have been published in 2025 in peer reviewed scientific journals, and more are expected to come in the following years

Additionally, in order to present its range of complementary analytical techniques to a new audience of young researchers, CERIC took part in the ninth scientific meeting of PhD students at the Barcelona Nanocluster-Bellaterra (BNC-b), which brings together several scientific institutions involved in materials science, such as ICMAB, ICN2, IMB-CNM and UAB.

Figure 25
Two moments drawn from the activities conducted for the project PaGES 9.

Public Engagement Activities

Public engagement is becoming increasingly important for RIs because it connects scientific institution with society in several, meaningful ways: first of all, involving the broader audience in conferences, workshops and events, it promotes science literacy and education, moreover it helps people understand what the research is doing and why it matters for socitety; it shows how, within the research process, decisions are made and how data are used, making RIs more transparent and accountable; finally, it fosters innovation and collaboration with citizens, industry, educators, and policymakers. That's why also in 2025 CERIC was involved in important science dissemination activities at a regional and national level.

CERIC at Genoa Science Festival

In 2025, CERIC participated to the 23rd edition of the Genoa Science Festival, one of the most important European science communication events: every year, between October and November, the Festival brings together hundreds of scientists, researchers, science communicators, artists and authors (opening the doors to science enthusiasts too) from all over the world. CERIC organised, together with the Italian Institute of Technology, a conference: Indiana Jones and the Last Test Tube – with Chiaramaria Stani (expert in technologies applied to cultural heritage former CERIC researcher, now beamline scientist at Elettra Sincrotrone Trieste) and Roberta Zanini (researcher at the Centre of Cultural Heritage Technology in Venice and CERIC user). The event explored how, nowadays, archaeological research is supported by the most advanced scientific techniques, which enable the chemical composition of artefacts to be studied non-invasively, revealing their history and the changes they have undergone over the centuries. The conference reached a total of around 60 participants, and has been broadcasted live via a streaming service.

Figure 26

A glimpse of the *Indiana Jones and the Last Test Tube* conference at Genoa Science Festival 2025.

CERIC's contribution to Trieste Next 2025

In 2025 CERIC participated to the 14th edition of Trieste Next, the Festival of scientific research that animated the heart of Trieste with conferences, exhibition and hands-on activities. The event is a showcase for innovation and applied research where scientists and entrepreneurs present their experiences and tell how, thanks to the technological transfer of cutting-edge research, new solutions can be created. The 2025 edition was entitled "Life Within. Conversations Across Sciences and Technologies" and has been promoted by the Municipality of Trieste, the University of Trieste, ItalyPost, Area Science Park, OGS and SISSA.

In particular, CERIC organised, together with Elettra Sincrotrone Trieste, two conferences, involving some scientists working at its Facilities, as well as national and international experts and Directors of other research instituions and RIs:

- *Art forgeries and crime: scientific responses*, with Vittoria Luda Di Cortemiglia, Gianluca Quarta, Franco Zanini – the panel focused on the role of advanced analytical techniques in preventing and combating international trafficking of cultural goods and art forgeries;
- *Large Infrastructures Connecting Ideas, Tech, People* - with Alessandro Fabris, Lilli Freda, Andrew Harrison, Caterina Petrillo, Maurizio Vretenar - the roundtable analysed the impact of large and/or distributed research infrastructure at the local and international level, from different points of view, such as economic development, technology transfer, and employment.

Both conferences reached full room occupancy, with a total of around 150 participants. The conferences were also broadcasted live via a streaming service. Moreover, CERIC joined Elettra Sincrotrone Trieste and Area Science Park at exhibition space with an activity (an educational quiz) dedicated to OPVStability, one of the European projects the Consortium is a partner. The activity has been carried out by the communication staff, together with one of the PhD students involved in the Project, and over the three days of Trieste Next, around 250 people took part to the activity.

Figure 27

CERIC presentation at the conference *Art forgeries and crime: scientific responses*, Trieste Next 2025.

4

Cultivating Innovation and Industry Cooperation

One of CERIC’s objectives is to encourage collaboration between its Facilities and industry. The long-term goal is to contribute to Europe's innovation potential by establishing the Consortium as a leading resource in the field of advanced materials, a key enabling technology that affects the performance of industrial and technological strategic sectors.

The activities of the Industrial Liaison Office (ILO) aim to raise industry awareness of RI potential and solutions through continuous promotion. They also aim to embed CERIC in the innovation ecosystem and align the knowledge and potential of RIs with industrial innovation needs.

Main Achievements in 2025

1. **Promotion of the CERIC services for the industry at major events: EIC webinar, FEM Euromat, EU Hydrogen Week.**
2. **New ongoing negotiations with two EIC Beneficiaries operating in the fuel cells and nanomaterials domains, feasibility tests carried out for a third Beneficiary on PFAS domain.**
3. **Collaboration with a venture capital firm.**
4. **6% of the articles from open access research was related to industry.**

Industrial Liaison Activities

In 2025, CERIC continued to strengthen the European innovation ecosystem by involving public and private stakeholders, and by creating opportunities to increase the Consortium's impact on industry. CERIC was invited to speak at an European Innovation Council (EIC) webinar dedicated to bringing EIC partners and beneficiaries together to highlight the strategic role that research infrastructures can play in the European innovation ecosystem. Thanks to this and other specific actions aimed at engaging the EIC community, in 2025 CERIC began negotiations with two EIC beneficiaries in relation to fuel cell testing and nanomaterials. These actions have also led to collaboration with another EIC beneficiary on the analysis of per- and polyfluoroalkyl substances (PFAS). CERIC is also part of the European ReMade@ ARI project, through which three companies gained access to its facilities in Romania, the Czech Republic, and Poland in order to collaborate on industrial innovations.

In addition to CERIC's involvement in the EIC community, two opportunities were scouted and analysed in 2025 to better embed CERIC within national and regional players in the innovation ecosystem. One such opportunity was a collaboration with an Italian venture capital firm dedicated to new technology-based companies. CERIC signed a framework agreement to become part of their network of partners to provide scientific and technical support to companies in which the firm invests. CERIC also entered into conversations about joining the DeepTech Alliance, a private, non-profit association of European entrepreneurship hubs associated with universities and research institutions. The Alliance connects European start-ups, international corporations, and investors to explore partnerships through various programmes.

The continuous promotion of the PFs' services and capabilities to industrial users has been carried out by participating in relevant research-to-business events such as the FEM Euromat congress and exhibition on advanced materials and processes, which brings together researchers, industry professionals, and academics to share cutting-edge developments in materials science and technology. CERIC participated to promote the Consortium at the EU Hydrogen Week 2025, Europe’s flagship annual event for the hydrogen sector, which brings together policymakers, industry leaders, researchers and investors. CERIC´s ILO has also participated and represented the Consortium at CPHI 2025, a leading global pharmaceutical industry event. Such event featured extensive exhibitions, networking opportunities and expert-led sessions on areas of innovation such as bioproduction and sustainable pharmaceutical manufacturing.

In order to align the knowledge and potential of RIs with the industry's innovation needs, CERIC's ILO continuously updates its marketing offer. An extensive analysis of the pharmaceutical sector has been carried out, examining the latest innovations and the challenges affecting or slowing down the market adoption of certain technologies. The analysis has also defined which CERIC techniques can work synergistically to solve these challenges.

As for industrial usage of CERIC PFs via open access in 2025, 6% of total accesses were related to industry-linked projects. Regarding publications, 6% of articles released in 2025 were industry-related, accounting for publications with company-affiliated authors, or those connected to proposals of industrial interest.

5

Advancing the European Research Infrastructure ecosystem

Research Infrastructures (RIs) play a cruial role in strengthening the European Research Area (ERA) by providing cutting-edge facilities, services, data resources, and expertise that enable scientific excellence, innovation, and international collaboration. As Europe faces increasingly complex societal, technological, and environmental challenges, RIs and their consortia (ERICs) are expected not only to support science but also to contribute actively to the competitiveness, resilience, and sustainability of the European research and innovation system. To fulfil this mission, they must operate within a robust and forward-looking ecosystem, that – through coordinated action at both institutional and policy levels - facilitates cross-border cooperation, promotes mobility of talent, accelerates digital and green transformation, and ensures effective governance frameworks. In this chapter, we analyse the actions taken by CERIC in 2025 to help building a more integrated, efficient, and resilient European RI ecosystem.

Main Achievements in 2025

1. **Strengthened CERIC's position as a key reference for the ERIC community by advancing work on a European employment contract and contributing to the identification of challenges and recommendations inherent to the ERIC Regulation.**

2. **Fostering staff and researcher mobility within CERIC's headquarters and its Partner and Associated Facilities.**

Toward a European Employment Contract

The year 2025 opened with the publication of the report – Employment Regulations Applied to Researchers and Support Staff in Different Countries (Deliverable 11.1) – within the framework of the Second Implementation Project of the ERIC Forum. CERIC led this effort as Leader for the dedicated Work Package (WP11).

The Deliverable was the result of a year-long analysis of current employment practices across Europe, covering both international organisations based in Europe and ERICs. It represented, however, only a first step towards the project's broader and more ambitious goal: exploring the path to a common legal framework for employment contracts to be presented at EU level.

Having analysed key elements of unified employment contracts and the main issues arising from differing national legislation, the group then focused on other central topics, such as unified job titles and classification across ERICs, competence frameworks and career development, as part of the strategy for implementing a European employment contract.

In April 2025, WP11 invited the European Commission's DG Research & Innovation to discuss precisely this latter point. The online workshop Strategy for ERICs' European Employment Contract, held on 8 April, combined a thorough review of existing challenges with a collaborative, forward-looking discussion drawing on contributions from experts with policy, legal, and operational backgrounds. The event aimed to produce a strategic roadmap that could serve as a reference for future negotiations and policy development.

WP 11 decided to adopt the RMComp competence framework, published by the EC in … to identify the competences corresponding to each job family and level proposed for the unified employment contract. This approach was discussed in a second key engagement opportunity for the ERIC community, this time in partnership with the EIROforum Working Group on Training and Career Development. The online event Skills Assessment and Workforce Development at International Research Infrastructures, held on 2 December 2025, quickly established itself as a productive forum for exchanging experiences in the development and application of skills assessment systems and staff grading frameworks. Representatives from major European research infrastructures — including CERN, EMBL and ESA — participated alongside several ERICs, , ELI ERIC, and LifeWatch ERIC. Together, participants identified common grounds and areas for growth, and discussed the possibility to enhance staff mobility through harmonization within Research Infrastructures and beyond. This led to the decision to explore the potential of RMComp as a tool for supporting the definition of a grading system.

For a digital and green future

CERIC's engagement within the ERIC Forum extended to another central theme: the digital and green transition. In this context, the Consortium took on the role of Work Package Leader for the dedicated working group, initiating the mapping of the actions currently being undertaken by the 32 operational ERICs in these areas, including the collaboration and joint efforts between ERICs. These actions include the improvement of the energy efficiency of buildings, scientific instrumentation, and the services provided by ERICs, the voluntary adoption of ESG frameworks and environmental reporting, as well as existing measures for reducing energy consumption and other actions inherent to the nature of the ERIC, such as contributing to policymaking through monitoring, evaluation and reporting and

the identification of the research fields of the ERIC that contribute to the green deal priorities. For the digital transition, the mapping surveys the adoption of new technologies and digital solutions for the operation of the research infrastructure.

Monitoring the implementation of the ERIC Regulation

CERIC also contributed to the activities of Work Package 12 group, whose ultimate purpose was to identify challenges, negative consequences and barriers, linked to the implementation of the regulation and propose mitigation strategies. The work performed focused on two main areas: the challenges related to the integration of new communities, projects or RIs in existing ERICs or their mergers, and the challenges and practical hurdles regarding the implementation of the VAT exemption, including its interpretation and use at national level. For the first, the task identified the ERICs that had undergone such processes and engaged them in the preparation of a discussion with all the ERICs, to take place in 2026. For the VAT, the group developed a challenges matrix based on the most common cases identified, that served as the basis for a survey. The results of the survey will be collected and analyses, and followed by an individual interview with the ERICs, with the aim to deliver policy recommendations to tackle the issues related to the implementation of the ERIC Regulation and VAT exemption in 2026. Related to the work done by Work Package 12 there were also the tasks of Work Package 13, where CERIC contributed to the analysis of the challenges in the implementation of the ERIC regulation from the perspective of the distributed, multi-site and single-site ERICs. The analysis served as the base for a survey performed during the ERIC Forum Annual meeting in Brussels, in November 2025. The responses collected will serve as the base for policy recommendations, to be delivered in 2026.

Fostering staff mobility and sharing of knowledge among European countries

Mobility is another priority area for the European Union in which CERIC has played an active role. Through its internal projects (see Ch. 2) and the secondment programme of the European project ERA-Shuttle (see Ch. 1), the Consortium has both recruited scientists for placements at its own Facilities and hosted incoming staff and researchers from partner institutions, enabling a two-way flow of knowledge and expertise across the European research landscape.

On the incoming side, Monika Adamczuk (University of Gdańsk) and Elena Sultana (University of Malta) completed their secondments at CERIC-ERIC's Industrial Liaison Office and User Office, respectively, within the ERA-Shuttle project. To highlight the importance of similar initiatives, we would like to quote an excerpt from Elena Sultana's interview, reflecting on her time at CERIC-ERIC:

> *"What I enjoyed most was the cross-functional exposure — interacting with experts across IT, HR, communication, user support, and scientific coordination. The multifaceted view into CERIC's operational and strategic processes gave me invaluable insight into the collaborative ecosystem behind major research infrastructures. I particularly appreciated the hands-on understanding of the access policy design and its practical implementation, as well as the opportunity to observe how user support is extended from the moment of proposal submission all the way to post-experiment publication."*

A schematic view of the personnel working on internal and EU-funded projects at CERIC PFs and AFs:

SIMONE AMATORI
CECOMEC

GIUSEPPE SATTA
DNANANOCERIC

ELEONORA AFANASENKO
UKRAINIAN CALL FOR POST DOC

NAGORNY ANATOLII
UKRAINIAN CALL FOR POST DOC

ELISA DE PIANTE
SLOVENIAN NATIONAL MEMBERSHIP FEE

SUMEA KLOKIC
INCITE

DEVINA GUPTA
OPVSTABILITY

SILVIA ROTONDI
PATHCHIP@CERIC

JAROSLAV HERMAN
AEMWE

CHIARAMARIA STANI
CH-ERIC

6

Operations and Finance

As Research Infrastructures (RIs) operate in an increasingly complex scientific, technological, and funding landscape, strengthening governance, operational efficiency, and strategic coordination has become essential to ensuring long-term sustainability and scientific excellence. In particular, for a RIs consortium such as CERIC, continuous improvement of its organisational and management frameworks is not only a prerequisite for effective service delivery but also a key enabler of innovation, international collaboration, and stakeholder engagement. Below we outline CERIC's main efforts in the field of operational enhancement, including updating of its Internal Regulations, as well as Financial Statements for 2025.

Main Achievements in 2025

1. **CERIC's Internal Regulations updated.**
2. **New ISTAC Chair and Deputy Chair.**
3. **Development of the CERIC's Proposal Management System continued in 2025.**
4. **Financial and in-kind annual account.**

CERIC's Internal Regulations Updated

In CERIC, the Internal Regulations (IRs) as approved by its General Assembly (its Governing Body composed by the Representatives of the Countries participating as Members in CERIC) integrate and detail the provisions of the Statute which, in its turn, details and implements the legal framework and the scope of CERIC as set by the European ERIC Regulation. The IRs allow to translate the general legal framework into rules and guidelines that govern how the Consortium operates on a day-to-day basis. They are 15 and cover areas such as the evaluation and impact assessment of the facilities, entry of new Members and Observers, user selection and access procedures, data management, intellectual property rights and technology transfer, financial management, and the roles and responsibilities of staff, as well as the operation of governing bodies and PFs/AFs.

The IRs are a "living document" and their update is essential to adapt the Consortium's structure and organisation to the evolving scientific and technological landscape and legal and regulatory frameworks in an internationally distributed setting such as CERIC.

Within this context, in 2025 CERIC's General Assembly has approved the update of two IRs related to the definition and role of Representing Entities, Partner Facilities and Associated Facilities (including the introduction, regulation and use of Membership Fees). The revision and update process of the other IRs concerning CERIC's Statutory Seat, governing Bodies and Executive Director, new Members and observers, open access process and administration and accounting procedures are currently under way and will be discussed in the next General Assembly.

New ISTAC Chair and Deputy Chair appointed

The International Scientific and Technical Advisory Committee (ISTAC) provides independent advice to the CERIC General Assembly and the Executive Director on all strategic issues, as well as on the scientific and technical activities carried out by the Consortium.

In 2025, following the appointment of Andrew Harrison, former Chair of the Committee, as Executive Director of CERIC, elections were held, resulting in the appointment of two distinguished scientists in the leading roles: Annalisa Pastore (King's College London, with a solid background in structural biology) has been appointed as ISTAC Chair, while Robert McGreevy (STFC Rutherford Appleton Laboratory, great expertise in neutron scattering) has been appointed as Deputy Chair.

CERIC Proposal Management System

The Proposal Management System (PMS) is a web portal—comprising a collection of web applications—that enables users to manage the entire lifecycle of their applications for access to the scientific instruments offered by the CERIC consortium. It also supports users in fulfilling the obligations associated with the use of these instruments. The PMS serves as the main entry point for users accessing CERIC's distributed Research Infrastructure (RI) and manages a significant part of the user journey.

The software, which exploits a modern technology stack and a fresh approach, is still in an active development phase - which began in 2024 - particularly in its core components. However, in December 2025, a Beta version was released by the CERIC IT Staff, introducing additional features compared to the Alpha version released the previous year. A sandbox environment is always available for collecting feedback, conducting internal testing, and showcasing ongoing developments.

Financial Statements 2025

The financial statements give the details of the additional expenditure for the organisation, coordination and governance activities of the Consortium, which contribute to increase the effectiveness of the much larger in-kind contributions by the CERIC's Member Countries through the PFs.

These financial statements are compiled in conformity with the IPSAS (International Public Sector Accounting Standards) international accounting standards issued by the International Public Sector Accounting Standard Board (IPSASB).

Balance Sheet - Assets and Liabilities	2025	2024
ASSETS	**11,386,444.52**	**8,882,464.67**
Non-current Assets	**2,700,428.42**	**2,971,382.57**
Plant, property and equipment	2,676,506.06	2,933,081.95
Intangible assets	23,922.36	38,300.62
Investments in associates	-	0
Current Assets	**8,686,016.10**	**5,911,082.10**
Inventories		-
Long-term credits		
Short-term credits	299,164.83	90,313.88
Other current credits and receivables		
Cash and cash equivalents	8,370,338.31	5,805,703.30
Prepayments and accrued income	16,512.96	15,064.92
EQUITY AND LIABILITIES	**11,386,444.52**	**8,882,464.67**
Equity		
Equity		
Capital and other permanent contributions from Members		
Reserves		
Accumulated profits		
Non-current Liabilities	**1.717,153.20**	**529,174.56**
Long-term financial debts and loans		
Other long-term debts and liabilities	1,200,000.00	
Advance payments for externally funded projects	1.208,048.89	243,719.57
Pensions funds and other benefits for compensation employment	309,104.31	285,454.99
Long-term provisions		
Current Liabilities	**9,669,291.32**	**8,353,290.11**
Short-term financial debts	800,0000.00	
Other short-term debts and liabilities	255,722.86	344,959.58
Advance payments for projects	1,479,384.89	347,651.50
Other current payables	219,922.46	279,575.98
Contingent liabilities	-	40,783.62
Deferred income and accrued expenses	7,914,261.11	7,340,319.43

Profit and loss account		2025	2024
Revenues		**3,415,950.17**	**2,927,480.77**
National and international grants and contributions		3,373,283.96	2,922,363.29
	Contributions in-kind		
Other revenues	Other revenues	42,666.21	5,117.48
Operating costs		**2,518,193.32**	**2,423,102.14**
	Costs for raw materials, supplies and goods	87,466.81	3,437.71
	Costs for services	646,566.71	956,158.83
	Resources committed in-kind to CERIC from contributors	-	-
	Staff costs	1,755,493.18	1,446,405.27
	Costs of rents, concessions and royalties for trademarks	893.22	0.00
Other operating costs	Costs for institutional activities	27,773.40	17,100.33
Ebitda (Earnings before Interest, Taxes, Depreciations and Amortizations)		**897,756.85**	**504,378.63**
Depreciation		925,253.19	474,413.51
Write-downs for impairment of tangible and intangible assets		-	-
Ebit (Earnings before interest and taxes)		**-27,496.34**	**29,965.12**
Financial income and expenses		**71,641.34**	**7,212.88**
	Financial income	72,367.27	7,485.10
	Financial charges	-725.93	- 272.22
Income from investments			
Value adjustments to financial assets			
Result before tax		44,145.00	37,178.00
Taxes		44,145.00	37,178.00
Result for the year		**0.00**	**0.00**

Additional information is provided in Annex 1 (Notes to the Financial Statements as at December 31, 2025) in order to explain the assumptions used to prepare the numbers in the financial statements as well as to better understand the company’s financial position.

Annex 1

Notes to the Financial Statements as at December 31st, 2025

Accounting Criteria

These annual Financial Statements have been compiled in conformity with the IPSAS (International Public Sector Accounting Standards) international accounting standards issued by the International Public Sector Accounting Standard Board (IPSASB), and in process of being adopted by the European Commission within the meaning of Council Directive No 2011/85/EU of 8 November 2011, on requirements for budgetary frameworks of the Member States.
The decision voluntarily to adopt an accounting system that can be connected to international principles is consistent with the process of harmonization started some time ago by the EU Commission, but not yet completed.
The IPSAS can in general function as a basis for a harmonised accrual-basis accounting standard passing through its transformation into EPSAS (European Public Sector Accounting Standards). The aforementioned EU Directive states that “by 14 December 2018 the Commission shall make public a review of the sustainability of the Directive (see art.16).
CERIC-ERIC is set up as an international organization with scopes of general interest typical of an entity referable to the public sector. CERIC-ERIC should therefore be able to relate to its Members in different countries in a common language. This should be adopted in all matters and at all levels, and thus also in the model of presentation of economic-financial topics that support annual accounts and budgets.
The use of international accounting standards referable to the public sector, taking-into account the specific character and scopes of CERIC-ERIC, adequately conforming to the legal characteristics of the entity and to its functions and scope, allows the development of well-defined best practices, the impact of which on the financial aspects is measurable and effective. The use of international accounting standards, in fact, allows information on the financial statements to be presented in a common way for users/stakeholders of different nationalities.

It is possible in this way to ensure that:
- the information is relevant, reliable, comparable and understandable;
- the terminology used is common, appropriate and explanatory among Members and for similar international organisations outside Europe;
- the financial statements are auditable by the International Standard of Audit by auditors from different nations;
- a host country change - and thus any site change - is not relevant for the comparability of information and models, books and records of the accounting system;
- the accounting system is able to present the in-kind contribution model, and to provide analytical accounting for projects and separate accounting for economic activities.

The aim of the annual financial statements is to provide information on the assets and liabilities, the profit or loss and changes in the financial structure of the Consortium, useful to a wide range of users. The financial statements are prepared within a general-purpose framework.

The financial statements have been compiled in accordance with the principles of clarity and transparency and provide a correct and exhaustive framework of information on property relations, as well as economic and financial relations implemented by the Consortium in carrying out its activities.
They have been compiled taking-into account international accounting standards for the public sector (IPSAS), where applicable, and integrated in order to be consistent with the legal and effective structure of CERIC.
Of the various options allowed by IPSAS 1, the Consortium has chosen to present the layout of the balance sheet distinguishing between current and non-current items, and the layout of the profit and loss account classifying the expenses by nature.

In its drawing-up, the following principles have been observed:
- The items have been evaluated prudently, taking into account the perspective of the continuity of the activities, as well as the economic function of an asset or liability;
- Only incomes and expenditures related to the financial year have been accounted, independently on the day of encashment or payment;
- The risks and losses related to the financial year have been accounted for, even if known after the end of the financial year.

These Notes have been compiled with the aim of clarifying, completing and detailing the information contained in the balance sheet and in the profit and loss account, in addition to providing information on the applied evaluation criteria, on movements that have taken place, and changes in various assets and liabilities.
The explanatory notes are an integral part of the following documents, to present these financial statements and provide descriptive and schematic information, with particular reference to property aspects, as well as economic and financial aspects of the overall management.

The financial statements comprise the following parts:
- Balance sheet
- Profit and loss account
- Explanatory notes
- Management report
- Reconciliation between final budget and Annual Accounts
- Statement of cash flow
- Trend of the net financial position (NFP)

Evaluation Criteria

The financial statements have been compiled in accordance with the principles of clarity and transparency and provide a correct and exhaustive framework of information on property relations, as well as economic and financial relations implemented by the Consortium in carrying out its activities. They have been compiled taking-into account international accounting standards for the public sector (IPSAS), where applicable.

Balance Sheet
Items in the balance sheet are classified into/distinguished as current/non-current.

Assets
Assets have been classified as current assets when:

- They have been realised during the normal operating cycle of the institution;
- They are cash or equivalent complement not restricted in its use.

Assets realizable within the operating cycle have been classified as current, regardless of whether they have actually been realized within 12 months from the balance sheet date. Non-current assets include tangible assets, intangible

assets (licenses and in general all assets not related to the operating cycle and realizable after 12 months from the balance sheet date).

Liabilities

Liabilities have been considered current liabilities when:

a. they are extinct in the course of the normal operating cycle of the institution;
b. extinction is due within 12 months from the balance sheet date.

Other liabilities, i.e., those not related to the operating cycle and all other institutional liabilities, are classified as current if their extinction is due within 12 months from the balance sheet date. Otherwise, they are recognized as non-current liabilities.

Deferred Incomes and Accrual Expenses

This item includes the amount of funds received up to December 2025 and not yet fully used by 31.12.2025 for the purposes for which they were intended. They will therefore continue to provide utility in coming years, for the same purposes. This item represents the carry-over for balances of the subsequent year to that under review. In this regard, the Consortium is obliged to operate in future years in fulfilment of the mandate required by the Italian Ministry of Education, University and Scientific Research, who assigned the financial funds (FOE) under which CERIC activities were carried out in 2025, and by the other member states in order to pursue the scopes.

In-kind Contributions

Contributions in-kind will be included in the financial statements on the basis of the details contained in the document entitled "Methodology for Defining the Values Involved in CERIC-ERIC Activities, and to Detail In-kind Contributions".

In-kind non-monetary contributions will be distinguished (when realized) between:

1) Those strictly related to the cost of the production factors (exhausting their utilities during the ordinary cycle);
2) Those strictly related to covering investments (in intangible and tangible assets).

Profit and Loss Account

The drawing-up of the profit and loss account is regulated by the IPSAS, integrated and conformed to be consistent with the characteristics and scopes of CERIC-ERIC.

Incomes

Incomes are increases of benefits connected to the administrative year.

Costs/Expenses

Costs/expenses are decreases of economic benefits of the administrative year. The analysis of costs has been explained in the overview of profit and loss account using a classification based on their nature.

Assets

Non-current Assets - Tangible Assets

Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
2,933,081.95	2,676,506.06	**-256,575.89**

Most of the acquisitions completed during the year refer to the investment in capital equipment linked to the research projects INTEGRA and EOI call for proposal; a marginal part refers to supplies for the central seat.

The following flow chart shows the change in individual items summarised in the present note.

Description	Property	Technical furniture	Electronic office machines	Office furniture	Mobile phone	Equipment in progress	Total
Balance as at 31/12/2024	**-**	**2,718,706.06**	**28,890.64**	**2,914.56**	**2,968.49**	**179,602.20**	**2,933,081.95**
Acquisitions during the year	-	692,410.24	2,205.00	-	-	486,613.27	1,181,228.51
Increases during the year	-	-	-	-	-	-	-
Decreases during the year	-	-	-	-	-	-528,186.47	-528,186.47
Depreciation for the year	-	- 897,431.56	-9,740.00	-1,595.01	-851.36	-	- 909,617.93
Balance as at 31/12/2025	**-**	**2,513,684.74**	**21,355.64**	**1,319.55**	**2,117.13**	**138,029.00**	**2,676,506.06**

The balance sheet items “Decreases during the year” is referred to the completion in 2024 of the supply of scientific instruments in progress at the end of 2023; its value is included in under the acquisition made during the year.

Non Current Assets - Intangible Assets

Balance as at 31/12/2024	Balance as at 31/12/2025	Difference
38,300.62	23,922.36	-14,378.26

Historical costs at 31/12/2025 are as follows:

Description	Balance as at 31/12/2024	Operating increments	Operating decreases	Depreciation for the year	Value on 31/12/2025
Concessions, licenses, trademarks	38,300.62	1,257.00	-	-15,635.26	23,922.36
Intangible assets in progress	-	-	-	-	-
Total	**38,300.62**	1,257.00	**-**	**- 15,635.26**	23,922.36

Other Assets

Short-term Credits

The balance is divided according to the deadlines of the credits:

Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
90,313.88	299,164.83	208,850.95

The composition of the amount as at 31/12/2023 is as follows:

Description	Within 12 months	Over 12 months	Over 5 years	Total
Advances to REs	216,000.00	-	-	216,000.00
Other receivables	12,612.31	-	-	12,612.31
Tax advances	45,534.30	-	-	45,534.30

Advances to suppliers	25,018.22	-	-	25,018.22
Total	**299,164.83**	**-**	**-**	**299,164.83**

- The balance sheet item "Advances to REs"(€ 216,000.00) represents the part of the expenses transferred to the Italian Representing Entity for the implementation of two internal projects signed within the Expression of Interest call.
- The balance sheet item “Other receivables” mainly refers to payments made in relation to the destination of the severance indemnity of an employee to supplementary pension funds (€ 11,434.47). The remaining part is referred to VAT credits (€ 436.20) related to purchases linked to the commercial activity of the Consortium, to and other credits of different nature (€ 741.64)
- The balance sheet item “Tax advances” mainly refers to advance payments made in June and November 2025 (€ 44,596.00). These advance payments have been calculated on the basis of the fiscal charge from the previous year. The remaining part (€ 938.30) refers to tax advances related to the severance indemnities calculated for 2025.
- The balance sheet item “Advance to suppliers” (€ 25,018.22) mainly refers to advance payments for the support of scientific conferences planned in 2026 (€ 12,200.00), to the prepayment of the annual membership fee for 2026 to APRE (€ 7,437.00), the Agency for the Promotion of the European Research and to travel booking for activities to be carried out at the beginning of 2026 (€ 2,177.73).

Inventories

No values are entered for this item.

Cash and Cash Equivalents

The balance item Cash and Cash Equivalents represents the following financial postition: cash at the bank at the end of the financial year. It represents liquid assets and cash equivalents at the end of the year. Cash deposited and fixed term deposit at the bank Unicredit Banca Spa:

Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
5,805,703.30	8,370,338.31	2,564,635.01

In this context, the Consortium is in a credit position towards the Institute Unicredit, Agency of Trieste, where it has opened a current account for financial management. In December 2025, a sum of € 3,005,000.00 was delivered to this account by the Ministry of Education, University and Scientific Research through AREA di Ricerca of Trieste, to support the Consortium’s activities for the year reviewed. This amount included the Italian membership fee for 376,188.00 euro.
In the period April 2025 – December 2025, CERIC received from the Member States other than Italy the annual contributions according to the General Assembly resolutions for a total amount of 685.128,00.
In May 2025, an amount of 2.000.000 euro was credited to CERIC by the Czech Ministry of Education, Youth and Sports - Department of Research and Development in relation to the investment planned for the realization of the new CERIC beamline CUBE.
During the year 2025 CERIC received an amount of 56,061.60 as net bank interest for the time deposits hold in that period and other interests due from 2024.
In May 2025, CERIC received from the EU an amount of € 67.687,50, as advance payment for the ERIC FORUM2 project; in June 2025, CERIC received an amount of 837.890,63 for the ACTNEXT project. In September 2025, CERIC received from the EU an amount of € 50,224.24, as advance payment for the REMADE projects all funded by the EU.

Description	Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
Bank deposits	805,703.30	8,370,338.31	7,564,635.01
Fixed term deposits	5,000,000.00	00.00	-5,000,000.00
Total	**5,805,703.30**	**8,370,338.31**	**2,564,635.01**

Prepayments and Accrued Income

Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
15,064.92	16,512.96	1,448.04

This item measures income and expenses whose competence is delayed or advanced with respect to cash or documentary; they disregard the date of payment or collection of related income and expenses common to two or more years and distributable on time. The main part of the total amount (€ 16.512.96) refers to prepaid expenses related to the general costs of the Consortium (€ 9,012.96) or to prepaid expenses within a collaboration agreement signed with the Czech Representing Entity in CERIC. (€ 7,500.00).

Reserves

No values are entered for these items.

Accumulated Profits

No values are entered for these items.

Non-current Liabilities

Other Long-term Debts and Liabilities

Long-term advance Payments received for externally funded projects

Description	ReMade	IMPRESS	ERIC Forum 2	ERA SHUTTLE	OPV Stability	OSCARS	ACTNXT	TOTAL
Balance as at 31/12/2024	63,634.61	55,895.81	38,212.18	220,413.67	156,360.89	56,853.91	-	591,371.07
Expenses rescheduling after December 2026	-12,250.00	-16,500.00	-38,212.18	-180,385.00	-96,125.00	-39,850.00	-	-383,322.18
Balance as at 31/12/2025	**51,384.61**	**39,395.81**	**-**	**40,028.67**	**60,235.89**	**17,003.91**	**-**	**208,048.89**

The advance payments rescheduled after December 2026 have been indicated according to the Budget 2026 approved by the General Assembly in November 2025 with the resolution GA 2025.2 Annex 6.

Long term advance payments received by Member States for joint research investment

Category	31/12/2024	31/12/2025	Variation
Advance payment for CUBE Project	0.00	1.200,000.00	1.200,000.00
Subtotal	**0.00**	**1.200,000.00**	**1.200,000.00**

The amount indicated corresponds to 60% of the contribution received in 2025 from the Czech Ministry of research for the construction of the beamline CUBE, not yet spent as at 31.12.2025.
Considering the estimated maximum value of the tender (2.800.000, 00 euro), the planned date for the selection of the supplier (April 2026) and the terms for the payment of the contractual amounts: (see below), the part of the long-term debts represented in the financial statements corresponds to 1.200.000,00 euro.

Terms of payment:

- 20% at the date of the contract signature
- 20% five months after signature contract and subject to the approval of the optical elements and layout;
- 30% twenty-three months after the signature contract and subject to the Factory acceptance Tests.
- 30% twenty-nine months after the signature contract and subject to the Site Acceptance Tests.

Pensions Fund and Other Benefits for Compensation Employment

Severance indemnities for employees.

Description	Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
Severance indemnities for employees	285,454.99	309,104.31	23,649.32

The item is made up as follows:

Description	Initial value as at 31/12/2024	Plan balance 2025	Contribution to national funds for employees (FPLD)	Severances paid during the year	End value 31/12/2025
Severance indemnities for employees	279,164.05	56,473.94	- 4,267.59	- 33,700.56	297,669.84
Severance indemnities transferred to complementary social security funds	6,290.94	5,143.53	-	-	11,434.47

The severance set aside figure represents the actual debt of the Consortium at 31/12/2025, to the employees in force at that date.

The contribution to FPLD refers to the sum withheld from the severance indemnities of employees in favour of national social security institutions as a contribution to general social security purposes.

The amount of the severance indemnities paid refers for to the conclusion of 5 employment contracts during 2025 for € 33.700,56. Two of these contracts referred to fixed term researchers, hired within the joint research activities of the Consortium. The remaining positions were referred to the travel office, IT service and administration.

Current Liabilities

Other Short-term Debts and Liabilities

Debts

Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
344,959.58	255,722.86	-89,236.72

Debts are valued at their nominal value. The composition of the aforementioned amounts is as follows:

Description	31/12/2023	31/12/2024	Variation
Debts to providers	148,148.03	104,947.57	-43,200.46
Tax liabilities	125,763.17	96,911.49	-28,851.68
Payables to social security institutions	71,048.38	53,863.80	-17,184.58
Total	**295,478.72**	**344,959.58**	**49,480.86**

- "Debts to providers" are stated net of possible trade discounts.
- The item "Debts to providers" (€ 104,947.57) includes debts to third parties, mainly relating to services purchased on credit. This item appears on the entity's balance sheet as a current liability, since the expectation is that the liability will be met in less than a year.
- The item "Tax liabilities" includes liabilities for specific taxes, and is composed of withheld taxes for employees, associates and collaborators amounting to € 46,129.85, together with € 6,636.64 of VAT to be paid in 2025, and taxes due by the Consortium (€ 44,145.00). With reference to this last item, two advance payments were made in 2025 for a total amount of € 44,596.00 included in the short term credits.
- "Payables due to social security institutions" includes the amount of social security contributions relating to employees, accrued but not paid as at 31 December 2025, amounting to € 56,863.80.
- "Other payables", see table below, includes remaining debts, which by nature cannot be described above, including amounts due by CERIC to staff for all liabilities accrued to them, in accordance with current legislation and Personnel Regulations, including the value of accrued vacation paid at the time of reporting. This account at 31/12/2025 was as follows:

Description	31/12/2024	31/12/2025	Variation
Other payables	279,575.98	219,922.46	-59,653.52

Description	31/12/2025
Payables to employees (holidays and leave not taken)	151,151.96
Payables to bodies	23,375.00
Other debts of a different nature	45,395.50
Total	**219,922.46**

The final value of the item "Other debts of a different nature" as at 31.12.2025 refers mainly to the following expenses:

- costs for the spaces charged by Elettra Sincrotrone Trieste for hosting the statutory seat in 2025 (€ 39,291.77);
- users travel costs to be reimbursed in 2025 (€ 2,364.95);
- remuneration of the scientific CERIC body (€ 1,142.86);
- travel costs of the employees and collaborators to be paid in 2026 (€ 937.38).

Short-term advance Payments received for externally funded projects

The item "Advance payments for externally funded projects" includes the amounts listed in the table referring to the following running projects:

Description	ReMade	IMPRESS	ERIC Forum 2	ERA SHUTTLE	OPV Stability	OSCARS	ACTNXT	TOTAL
Balance as at 31/12/2024	12,250.00	16,500.00	38,212.18	180,385.00	96,125.00	39,850.00	-	383,322.18
Funds transferred to PFs	-5,772.00	-	-	-	-	-	-557,578.13	-563,350.13
Advance payment received from the EC during 2025	50,224.24	-	67,687.50	-	-	-	837,890.63	955,802.37
Accrual progress report for 2025	-9,646.88	- 8,369.63	-83,361.11	-68,785.92	-87,187.96	-36,913.62	-2,124.41	-296,389.53
Funds claimable within Dec. 2026	**47,055.36**	**8,130.37**	**22,538.57**	**111,599.08**	**8,937.04**	**2,936.38**	**278,188.09**	**479,384.89**

Description	Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
Advance payment for CUBE project	0.00	800,000.00	800,000.00
Subtotal	0.00	800,000.00	800,000.00

The amount indicated corresponds to 40% of the total amount of the contribution received in 2025 from the Czech Ministry of research for the construction of the beamline CUBE, not yet spent as at 31.12.2025. This percentage has been defined taking into consideration the terms of the tender issued in January 2026.

Contigent Liabilities

Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
40,783.62	0.00	-40,783.62

The potential credit claimed by a fiscal consultancy firm, which provision within the financial statements was made in 2021, has been written off. No requests of payment have been received by the Consortium in the following years.

Deferred Income and Accrued Expenses

For accounting the contributions provided by the Member States, the indirect method has been chosen and the stated amounts are representative of the portion attributable to future financial years.

Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
7,340,319.43	7,914,261.11	573,941.68

The item breaks down as follows:

Description	31/12/2025
Deferred income	7,913,981.11
Accrued expenses	280.00

The balance sheet item “Deferred income” measures:

- the portion of the contribution funded by the Italian MIUR for the investment activities of the CERIC statutory seat deferred to the following years for the amount of 6,341,612.37;
- the annual contribution of the Member states for 2024 and 2025 not spent within December 2025, committed to specific investment activities deferred to 2026, for the amount of 1.572.368,74.

The amount of 7,913,981.11 is derived as follows:

Deferred incomes as at 31.12.2024	Depreciation costs covered in relation investment made before 2025	Use of the membership fees in 2025	Consortium investments made in 2025 covered by the Italian contributions of the previous years	Membership fees 2025 to be spent starting from 2026	FOE 2025	Running costs 2025 covered by FOE 2025	Investment 2025 covered by FOE 2025	Deferred incomes as at 31.12.2025<
7,340,039.43	-82,983.12	-83,631.26	-851,314.25	955,184.28	2,589,520.23	-1,955,824.30	2,990.10	7,913,981.11

Category	Amount
Costs for raw materials, supplies and goods	87,466.81
Costs for services	646,566.71
Staff costs	1,755,493.18
Costs of rents, concessions and royalties for trademarks	893.22
Costs for institutional activities	27,773.40
Financial charges	725.93
Taxes	44,145.00
Depreciation	925,253.19
Total revenues	**3,488,317.44**

Total Costs for 2025	3,488,317.44
Annual membership fees 10% all	-106,131.60
Other revenues	-42,666.21
Financial revenues	-72,367.27
Incomes from EU projects	37,159.20
Consortium investment covered by FOE 2025 and previous years	-934,297.37
Use of the membership fees	358,512.65
Balance	**2,708,583.39**
FOE 2025	2,586,530.13
Carry over from 2025	-633,695.93
Balance	**1,952,834.20**

The amount of the deferred incomes is composed as follows:

Description	Amount
Resources committed to cover the depreciation quotes by using the member state contributions starting from 2026	43,325.91
Resources committed to cover the investment for the project INTEGRA	1,127,574.91
Resources committed to cover the investment for the research project MAG-ALCHEMI	22,295.01
Resources committed to cover the HR and technical investment within the Expression of Interest (EoI) call	3,824,421.95
Resources committed to cover the investments made within the Battery Plan Programme	331,786.01
Carry over from 2024	358,512.65
Carry over from 2025	633,695,93
Resources committed to cover the expenditure related to the use of the membership fees	1,572,368.74
Total deferred income as at 31.12.2025	**7,913,981.11**

The balance sheet item "Accrued expenses" (€ 280.00), measures the expenses that are recognized on the books before they have been paid. These expenses are recorded in the accounting period in which they are incurred.

Income Statement

Financial Revenues

Revenue items primarily identify the portion of the contribution for the financial year allocated by Italy for the Consortium’s activities through the public company Area di Ricerca, to cover the expenses of management, as well as the revenues related to projects externally funded.
The Italian contribution for 2025 (€ 2,628,812.00), recalculated considering the additional activities performed by Elettra-Sincrotrone Trieste S.c.p.A. (€39,291.77) for the spaces used by CERIC for its statutory seat, corresponds to

€ 2,589,520.23. The portion of the FOE 2025 spent in the current financial year corresponds to € 1,952,834.20. This amount mainly covers the operational costs of the Consortium (staff costs, general services, consumables for the seat). Part of the general costs in 2025 were covered by the accumulated revenues related to the projects funded by the EU (€ 42,605.68). Most of the depreciation costs are related to CERIC investment plans (Battery plan, INTEGRA project, EOI projects). These costs were covered mainly by FOE funds of the previous years.

Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
3,386,521.05	3,415,950.17	488,469.40

The composition of the amount at 31.12.2024 is as shown in the following tables:

Category	31/12/2024	31/12/2025	Variation
MUR hosting contribution	2,628,812.00	2,628,812.00	0.00
Costs charged by the Italian RE for spaces used by CERIC for the statutory seat	-39,323.29	-39,291.77	31.52
FOE funds for the closing year used to cover the depreciation costs related to investments made up to the end of the fiscal year	-16,055.17	-2,990.10	13,065.07
FOE funds of the current financial year to be spent in the following years	-358,512.65	-633,695.93	-275,183.28
Subtotal	**2,214,920.89**	**1,952,834.20**	**-262,086.69**

Another relevant part of the revenue items is represented by the contributions of the Members to the operating costs for 2025. The total amount of € 106.131.60 is composed by the following items:

- 10% of the total contributions from the member states for 2025.
- 10% of the contributions from the Polish member state for 2024.

According to the resolution 8th May 2023, the General Assembly (GA) agreed that as long as the contribution by the Host Member State of CERIC-ERIC allows covering the statutory operations fully, 90% of the Member's annual contributions are dedicated to supporting actions integrating the capabilities of the Member's Partner Facilities, such as PhDs, post-docs, joint research projects, infrastructure investments and promotion of CERIC- ERIC Partner Facilities research offer. These will be agreed upon by the GA, assuring that, over a 5-year average, this support to each Partner Facility will equal at least 90% of the cash contribution provided by the relevant Member during this period.

Category	31/12/2024	31/12/2025	Variation
Austrian annual contribution	10,867.60	10,867.60	0.00
Czech annual contribution	7,610.40	7,610.40	0.00
Croatian annual contribution	4,128.80	4,128.80	0.00
Hungarian annual contribution	5,978.40	5,978.40	0.00
Romanian annual contribution	7,651.20	7,651.20	0.00
Slovenian annual contribution	4,013.20	4,013.20	0.00
Italian annual contribution	37,618.80	37,618.80	0.00
Polish annual contribution (2024/2025)	0.00	28,263.20	28,263.20
Subtotal	**77,868.40**	**106,131.60**	**28,263.20**

In 2025, part of the contributions received by the Member States for the years 2024-2025 was used in relation to project initiatives started during the year.

Category	31/12/2024	31/12/2025	Variation
Use of the Croatian membership fee	0.00	67,892.42	67,892.42
Use of the Slovenian membership fee	0.00	15,738.84	15,738.84
Subtotal	**0.00**	**83,631.26**	**83,631.26**

Category	31/12/2024	31/12/2025	Variation
Commercial services	17,207.00	0.00	-17,207.00
CEI Project Contact3	6,337.16	0.00	-6,337.16
H2020 RE-Made Project	13,238.68	9,646.88	-3,591.80
H2020 ERA SHUTTLE Project	50,647.56	68,785.92	18,138.36
H2020 IMPRESS Project	8,958.12	8,369.63	-588.49
H2020 OPV Stability Project	20,667.31	87,187.96	66,520.65
H2020 OSCARS Project	33,188.71	36,913.62	3,724.91
H2020 ERIC FORUM 2	112,305.56	83,361.11	-28,944.45
H2020 ACTNEXT Project	0.00	2,124.41	2,124.41
Other incomes	6,781.61	42,666.21	35,884.60
Total other incomes	**269,331.71**	**339,055.74**	**69,724.03**

Contributions for Operating Expenses

The amount of the Italian contribution 2025 for the activities of the statutory seat of the Consortium is € 1,952,834.20. This amount will be reported to the Italian Ministry according to the FOE reporting rules.
This amount covered part of the costs for personnel, bodies, consultancies, and other costs of the seat, not covered by specific projects funded by other entities.

Contributions In-Kind

No values are entered for these items.

Costs

Operating Costs

Costs for Raw materials, Supplies, Consumables and Goods

This category includes costs incurred for the supply of consumable.

Category	Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
Costs for raw materials, supplies, consumables and goods	17,417.03	87,466.81	70,049.78

Most of the total value for 2025 refers to costs related to the use of the national membership fees.

Services Costs

It has been decided to divide the item service costs, to facilitate the clarity of the budget, into the following categories of expenses:

Category	31/12/2024	31/12/2025	Variation
Commercial services	15,400.00	-	-15,400.00
Legal, fiscal and administrative consultancy	8,495.44	**13,658.84**	5,163.40
Technical consultancies	6,014.78	**31,130.58**	25,115.80
Administrative collaborators	10,320.00	**0.00**	-10,320.00

Scientific and technical collaborators	110,523.58	**85,454.48**	-25,069.10
Social security contributions of collaborators	43,500.20	**42,127.86**	-1,372.34
Health contribution for collaborators	502.26	**557.53**	55.27
ISTAC remunerations	17,053.62	**14,410.71**	-2,642.91
Travel costs for employees, collaborators, and bodies	150,772.21	**135,392.30**	-15,379.91
Travel costs for users	106,046.89	**126,584.64**	20,537.75
Insurances	11,225.10	**11,206.94**	-18.16
Representation costs	5,296.91	**4,815.05**	-481.86
Consulting and salaries processing	33,416.83	**13,832.37**	-19,584.46
Mobile phones	7,298.71	**6,150.23**	-1,148.48
Annual software licenses	4,985.83	**6,801.91**	1,816.08
Workshops, seminars and publications	31,320.51	**36,390.25**	5,069.74
Canteen expenses	22,205.82	**23,189.31**	983.49
Bank charges	1,383.17	**1,631.03**	247.86
Postal charges	1,543.45	**2,063.65**	520.20
Agreement with Universities and other entitites to support PHDs	189,125.19	**32,818.00**	-156,307.19
Maintenances	7,075.38	**1,120.00**	-5,955.38
Training costs	11,334.47	**1,775.64**	-9,558.83
Transportation services	4,950.00	**4,479.28**	-470.72
Other costs	107,325.70	**49,734.51**	-57,591.19
Technical services	1,144.85	**1,241.60**	-96.75
Total	**908,260.90**	**646,566.71**	**-261,694.19**

The item “Other costs” includes mainly costs for the temporary staff (€ 34,341.54), costs for networking services provided by GARR, the Italian digital infrastructure dedicated to the education, research and culture community (€ 3,000.00), social media/publications/conferences and seminars expenses (€ 2,849.00), other minor services necessary for the seat activities (€ 9,543.97).

Personnel Costs

Personnel expenses breakdown:

Category	31/12/2024	31/12/2025	Variation
Wages and salaries	930,010.13	839,408.96	-90,603.27
Social security charges	276,587.43	251,701.56	-24,885.87
Seconded personnel (IKCs against payment)	0.00	0.00	0.00
Severance indemnities	73,402.94	68,450.68	-4,952.26
Allowances to be paid	155,972.57	151,151.96	-4,820.61
Director	204,064.08	191,026.72	-13,037.36
Social security charges for ED	31,249.62	33,078.90	1,829.28
Auditors and IAEC	175,000.00	175,000.00	0.00
Fellowships	15,129.70	45,674.40	30,544.70
Total	**1,861,416.47**	**1,755,493.18**	**-105,925.39**

Use of Third-Party Materials or Property

Category	Balance as at 31/12/2024	Balance as at 31/12/2025	Variation
Rentals	610.00	893.22	283.22

Other Operating costs

Other operating costs breakdown:

Category	31/12/2024	31/12/2025	Variation
Membership fees	5,500.00	5,500.00	0.00
Rounding	159.89	145.67	-14.22
Other taxes	31,086.03	19,502.30	-11,583.73
Other expenditures	4,221.31	2,625.43	-1,595.88
Total	**40,967.23**	**27,773.40**	**-13,193.83**

Depreciation of Tangible and Intangible Assets

Depreciation is calculated on the basis of the useful life of the asset and its use in production. For the first year of use, the percentages applied have been reduced by half.

Intangible Assets

Description	Depreciation Rate	Amount
Concessions and licenses	20%	15,635.26
Total amortization of intangible assets		**15,635.26**

Tangible Assets

Description	Depreciation Rate	Amount
Office machinery	20%	9,740.00
Equipment	20%	897,431.56
Telephony and mobile telephony	20%	851.36
Office furniture	15%	1,595.01
Total amortization of fixed assets		**909,617.93**

Taxation

Current tax	Balance as at 31/12/2023	Balance as at 31/12/2024	Variation
IRAP	44,604.00	44,145.00	-459.00

The annual tax related to institutional activity (IRAP) is calculated on the amount of salaries paid to employees, the amount of fees paid to collaborators and the costs of contracts for temporary employment, with the exception of remunerations paid for researchers. No fiscal charges related to the commercial activity.
The Consortium, in the context of purchases realized, and within the limits following from the Statute, may use VAT exemptions granted on the basis of Article 143(1)(g) and Article 151(1)(b) of Council Directive 2006/112/EC, and in accordance with Articles 50 and 51 of Implementing Regulation (EU) No. 282/2011 of the Council, and on the basis of Article 12 of Directive 2008/118 /EC. At the time of drafting the financial statements, Italy (in the quality of hosting country) has not yet identified it own contact point for the issuing of the VISA (or awarding the VISA exemption) as regards the purchases mainly made from EU suppliers

Financial Costs and Revenues

Under “Financial management”, accrued interest income on the bank account of the Consortium is stated as of 31.12.2025.

Interest on Current Account, Rounding and Exchange Rate Costs

The item represents remuneration on deposits of the Consortium on current account N. 000103334723 opened at Unicredit Banca.

Category	31/12/2024	31/12/2025	Variation
Interest on current account	0.00	21,576.05	21,576.05
Interest on time deposits	117,046.58	50,791.22	-66,255.36
Interest for fiscal debts	0.00	-118.89	-118.89
Exchange rate costs/rounding	-109.67	-607.04	-497.37
Total	**116,936.91**	**71,641.34**	**-45,295.57**

Report of the commercial activities

In 2025, no commercial contracts were carried out.

Following IPSAS 14, this paragraph reports about events that occur between the reporting date (31.12.2025) and the date when these Financial Statements were approved by the General Assembly.
In this context it is noted that no relevant event occurred.

Management Report

Comparison between Final Budget and Annual Accounts

Starting from the budget for 2025 approved by the GA in November 2024, during the financial year 2025 some budget adjustments were necessary as the result of the following:

FINANCIAL CHANGES

1. The increase of the resources available due to the definition of the actual carry-over for 2024. The 2025 budget was approved in November 2024 by the GA taking in to account an estimate of the carry-over for the year at closing. (+73,512.65 Euro);
2. The increase of the resources available mainly related to bank interests for the time deposits finalized in 2025 (+ 72,367.27 Euro) and other minor incomes (+ 42.839,34 Euro).

These additional resources have been allocated for the completion of the investment plans in the next financial periods, in particular the Expression of Interest initiatives

3. The receipt of the Polish member contribution for 2024 (+141,316.00 Euro), aimed to support the investment activities of the polish partner facility (+ 127.184,40 Euro) as well as the running expenses of the Consortium (+ 14.131.60 Euro)..
4. The redistribution of the expenses in relation to a project supported by the Region FVG.

Description	Initial budget	Changes	Final Budget	Expenses
SUPPORT TO MEMBERS CONTRIBUTIONS	828,000.00	127,184.40	955,184.40	83,631.26
FINANCIAL COVERAGE NEW ACTIV.	22,029.00		22,029.00	-
COLL. AGG. IT PF AND CERIC	2,525,000.00	-	2,525,000.00	2,525,000.00
BODIES - REMUNERATION	236,000.00	-	236,000.00	205,910.71
REMUNERATION FOR EMPLOYEES	1,711,192.00		1,711,192.00	1,287,185.55
OTHER PERSONNEL COSTS	155,000.00	-	155,000.00	-
COMMUNICATION	40,000.00	-	40,000.00	8,422.10
EXTER. SERV, CONSULTANTS, CONSUMABLS, TRAVELS	395,000.00	14,131.60	408,131.60	276,379.21
SPACES / FIXED ASSETS	105,000.00	-	105,000.00	3,462.00
TAXES	45,000.00	-	45,000.00	44,263.89
IT DPT.	55,000.00	-	55,000.00	8,158.53
ACCESS COSTS	180,000.00	-	180,000.00	121,683.33
PHD PROGRAMMES	124,857.00	-	124,857.00	29,025.50
PROJECTS EU FUNDED	399,522.00	-	399,522.00	336,999.36
PROJECTS FUNDED BY REGION FVG	-	-	1,000.00	1,000.00	608.41
TOTAL BUDGET expenses 2025	6,821,600.00	141,316.00	6,962,916.00	4,930,729.85
BATTERIES PLAN	213,455.54	-	-	213,455.54	21,363.42
EoI INVESTMENTS PLAN	2,793,000.00	72,367.27	73,512.65	42,839.34	2,981,719.26	807,869.20
MEMBERSHIP FEES 2024	700,815.60				700,815.60	-
RESOURCES COVERED BY COMMITTED FUNDS	3,707,271.14	72,367.27		42,839.34	3,895,990.40	829,232.62
RESOURCES COMMITTED IN THE PREVIOUS YEARS	**3,707,271.14**	72,367.27	73,512.65	**42,839.34**	**3,895,990.40**	**829,232.62**
GENERAL TOTAL	**10,528,871.14**	**213,683.27**	**73,512.65**	**85,678.68**	**10,858,906.40**	**5,759,962.47**

In order to ensure consistency in the financial reporting as well as to enabling stakeholders to effectively analyze the performance trends of the activities indicated in the budget approved for the closing year, in the following tables the amounts indicated in the budget are reconciliated with the figures indicated in the financial statements.

BUDGET		Amount
TOTAL Expenses (Contract signed, incurred costs and investments)		5,759,962.47
(-) FOE FUNDS TRANSFERRED TO THE ITALIAN P.F.	-	2,525,000.00
(-) INVESTMENTS accounted in the financial statements	-	654,299.04
(-) Contracts signed but not completed as at 31.12.2025	-	475,226.30
(+) DEPRECIATION COSTS accounted in the financial statements		925,253.19
(+) Contracts signed in 2024 and completed within Dec 2025		457,800.25
(=) BALANCE		**3,488,490.57**

FINANCIAL STATEMENTS	Amount
Operating costs	2,518,193.32
(+) Depreciation costs	925,253.19
(+) Financial costs	725.93
(+) Rounding	173.13
(+) Taxes	44,145.00
(=) BALANCE	**3,488,490.57**

Statement of Cash Flow

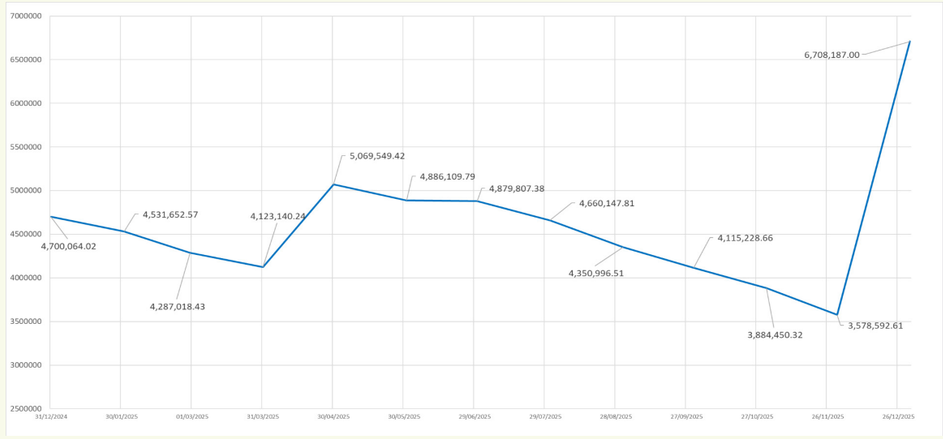
The cash flow statement identifies the sources of cash inflows, the items on which cash was expended during the year and the cash balance as at the end of the year.
Inflows and outflows are classified on the basis of their (operating or investment) nature.
In the following table is included information about the historical changes in cash (and cash equivalent) referring to operating, investing and financing activities.

Statement of cash flows for the years	2025	2024
Cash flows from operating activities		
Receipts		
Funded projects	2,962,139.53	281,294.06
Commercial activities	0.00	20,004.00
Hosting premium contribution	2,628,812.00	2,628,812.00
Contribution from Member states	1,061,316.00	778,684.00
Interest received	55,925.19	89,057.91
Other receipts	14,406.98	4,911.54
Payments		
Payments to staff	-926,732.61	-947,389.95
Other operating payments	-1,803,354.91	-1,660,912.77
Payments to project partners	-773,578.13	-
Net Cash from Operating Activities	**3,218,934.05**	**1,194,460.79**
Cash flows from investment activities		
Purchase of plant and equipment	-654,299.04	-2,264,143.17
Sale of plant and equipment		
Other	-	-
Net Cash Flow from Investment Activities	**-654,299.04**	**-2,264,143.17**
Cash flows from financing activities		
Proceeds from borrowings	-	-
Repayment of borrowings	-	-
Other	-	-
Net Cash Flow from Financing Activities	0	0
NET INCREASE/(DECREASE) IN CASH	**2,564,635.01**	**-1,069,682.38**
CASH, BEGINNING OF THE YEAR	**5,805,703.30**	**6,875,385.68**
CASH, END OF THE YEAR	**8,370,338.31**	**5,805,703.30**

Net Financial Position - Trend for the period Jan-Dec 2025

The Net Financial Position represents the net debt position of the Consortium during the year, through the comparison of the following balance items:

- + cash and cash equivalent
- + short-term monetary credits
- - short-term monetary debts



Additional disclosures on in-kind resources (with reference to Directive 2013/34/EU)

In relation to in-kind contributions, which statutorily constitute a particularly significant element in terms of the resources and organization that can be used by the Consortium, it should be noted that it was not possible to acquire all the accounting values for 2025 according to the principles of consistency and auditability on the basis of the revised "Methodology for Defining the Values Involved in the CERIC-ERIC Activities, and to Detail In-kind Contributions" approved by the General Assembly in June 2018.
However, it needs to be highlighted that, even before the set-up of the Consortium, some of the concerned PFs manifested themselves through this particular mode of contribution, which then allowed the immediate and consistent start of activities. These values were quantified, albeit with the limitations set forth above, by the various PFs and are shown in the tables below in order to provide supplementary information, which enables a better understanding of the relevance of the total resources used by CERIC in the whole financial year 2025.

Value of the in-kind contribution. Consolidated data (2025)

Total costs of the ordinary scientific/technical activities of the Partner Facilities in 2025 - COMMITTED IN-KIND								
	Recurrent costs							
PF	Personnel costs	Travels, Accomodation and similars	Consumables	Services	Technical devaluation & maintenance, lease/rent costs of equipment & spaces	Overheads	Cost of Access Committed to CERIC	Total
AT	287.170,07	16.867,07	105.987,83	-	-	-	346.752,92	**756.777,89 €**
HR	-	1.755,28	14.009,40	5.303,00	-	5.266,92	59.351,64	**85.686,24 €**
CZ	460.438,74	22.280,72	128.906,13	105.299,91	204.335,06	230.315,14	13.254,17	**1.164.829,87 €**
HU	181.330,00	979,00	716.189,03	69.044,88	4.172,90	242.928,95	-	**1.214.644,77 €**
IT	153.694,58	-	-	-	-	38.423,65	3.292.631,58	**3.484.749,80 €**
PL	-	-	-	-	-	-	770.323,88	**770.323,88 €**
RO	46.796,06	1.022,33	981,10	3.838,30	709,00	13.336,69	-	**66.683,47 €**
SI	-	-	-	-	-	-	216.392,65	**216.392,65 €**
Tot.	**1.129.429,45**	**42.904,40**	**966.073,49**	**183.486,09**	**209.216,96**	**530.271,35**	**4.698.706,84**	**7.760.088,58**

Annex 2

Scientific Publications

One-hundred and twenty-nine (129) scientific articles were published in 2025, with an average impact factor of 7,06 (versus 7,8 in 2024):

(1) **Mechanistic Study of Ethanol Decomposition on Co3O4(111) and Pd/Co3O4(111) Model Catalysts**, Reindl S., Skvara J., Hauner J., Simanenko A., Kastenmeier M., Ronovsky M., Skala T., Tsud N., Kettner M., Mehl S.L., Vorochta M., Smid B., Retzer T., Myslivecek J., Brummel O., Johanek V., Lykhach Y., Libuda J., ChemCatChem, DOI: 10.1002/cctc.202401587

(2) **Highly Dispersed ZnO Sites in a ZnO/ZrO2 Catalyst Promote Carbon Dioxide-to-Methanol Conversion**, Zhang X., Yu X., Mendes R.G., Matvija P., Melcherts A.E.M., Sun C., Ye X., Weckhuysen B.M., Monai M., Angewandte Chemie, DOI: 10.1002/anie.202416899

(3) **Deep ultraviolet Raman spectroscopic analysis of antihistamine drugs in oral fluid for forensic purposes**, Amin M.O, Matroodi F., Al-Hetlani E., Rossi B., Lednev I.K., Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, DOI: 10.1016/j.saa.2024.125595

(4) **Supramolecular dextran/polyamine phosphate nanocapsules with smart responsiveness for encapsulation of therapeutics**, Steffè A., Milano F., Reyes S.G., Buco F., Leonetti R., Roque-Diaz Y., Zuffi S., Di Gianvincenzo P., Cortese A.R., Ritacco H., Andreozzi P., Ortore M.G., Moya S.E., Marradi M., Journal of Colloid and Interface Science, DOI: 10.1016/j.jcis.2024.12.074

(5) **Amyloid aggregation in mixed whey proteins**, Venturi S., Rossi B., Matroodi F., Torre R., Lapini A., Foggi P., Di Michele A., Sassi P., Paolantoni P., Catalini S., Food Hydrocolloids, DOI: 10.1016/j.foodhyd.2024.110863

(6) **High entropy 2D metals sulfides: Fast synthesis, exfoliation and electrochemical activity in overall water splitting at alkaline pH**, Buravets V., Miliutina E., Burtsev V., Severa K., Shilenko V., Rosenkranzova J., Hönicke P., Hrbek T., Svorcik V., Lyutakov O., Applied Surface Science, DOI: 10.1016/j.apsusc.2024.161600

(7) **The shift in chemical potential of electrons upon intercalation of ZrSe2 by copper**, Shkvarin A.S., Suslov E.A., Postnikov M.S., Titov A.N., Materials Letters, DOI: 10.1016/j.matlet.2024.137673

(8) **Balancing Activity and Stability through Compositional Engineering of Ternary PtNi-Au Alloy ORR Catalysts**, Xie X., Briega-Martos V., Alemany P., Mohandas Sandhya A.L., Skala T., Rodriguez M.G., Novakova J., Dopita M., Vorochta M., Bruix A., Cherevko S., Neyman K.M., Matolinova I., Khalakhan I., ACS Catalysis, DOI: 10.1021/acscatal.4c05269

(9) **Towards a better understanding of biofoams: Multi-technique characterization of various tannin-furanic foams to assist in material selection for product design**, Sepperer T., Saccomano G., Bedolla D.E., Berger R.J.F., Šket P., Longo E., Zickler G.A., Borhani S., Dreossi D., Vaccari L., Musso M.E., D'Amico F., Materials and Design, DOI: 10.1016/j.matdes.2024.113538

(10) **Lamellarity of ultrasound assisted formations of dipalmitoyl-lecithin vesicles**, Bóta A., Amenitsch H., Wacha A., Ultrasonics Sonochemistry, DOI: 10.1016/j.ultsonch.2024.107187

(11) **Unraveling the Effects of Reducing and Oxidizing Pretreatments and Humidity on the Surface Chemistry of the Ru/CeO2 Catalyst during Propane Oxidation**, Dinhova T.N., Bezkrovnyi O., Piliai L., Khalakhan I., Chakraborty S., Ptak M., Kraszkiewicz P.P., Vaidulych M., Mazur M., Vajda S., Kepinski L., Vorochta M., Matolinova I., Journal of Materials Chemistry C, DOI: 10.1021/acs.jpcc.4c08033

(12) **Advances and Limitations of the Eu3+ Luminescent Probe for Monitoring Ce4+/Ce3+ Transitions in Ceria**, Bezkrovnyi O., Szymczak M., Marciniak L., Seminko V., Kraszkiewicz P., Małecka M., Pawlyta M., Vorochta M., Matolínová I., Journal of Physical Chemistry C, DOI: 10.1021/acs.jpcc.4c07466

(13) **Saponins Effect on Human Insulin Amyloid Aggregation**, Mari E., Vilasi S., Moretti P., Mangione M.R., Giorgini G., Galeazzi R., Ortore M.G., Biomolecules, DOI: 10.3390/biom15010040

(14) **In situ forming gels as subcutaneous delivery systems of curcumin and piperine**, Pula W., Pepe A., Ferrara F., Bondi A., Mariani P., Ortore M.G., Pecorelli A., Ivarsson J., Valacchi G., Esposito E., Scientific Reports, DOI: 10.1038/s41598-025-87750-w

(15) **Improving lithium-sulfur battery performance using a polysaccharide binder derived from red algae**, Zalka D., Vizintin A., Maximenko A., Pászti Z., Dankházi Z., Hegedüs K., Shankar L., Kun R., Saksl K., Strakova A., Jóvári P., Communications Materials, DOI: 10.1038/s43246-025-00734-1

(16) **Investigation of solid-liquid interface interactions in transition-metal chalcogenides in saline environments by ambient-pressure X-ray photoelectron spectroscopy for applications in desalination and mineral recovery**, Boukhvalov D.W., D'Olimpio G., Dadiani T., Santoro S., Cupolillo A., Kuo C.-N., Lue C.S., Bar-Sadan M., Hrbek T., Rodríguez M.G., Vorochta M., Curcio E., Politano A., Desalination, DOI: 10.1016/j.desal.2025.118628

(17) **Activity–Stability Relationship in Compositionally Tuned Magnetron Co-Sputtered Bimetallic Catalysts for Proton Exchange Membrane Fuel Cells**, Orság M., Mohandas Sandhya A.L., Xie X., Kučera J., Rodriguez M.G., Yakovlev Y., Dopita M., Matolínová I., Khalakhan I., Fuel Cells, DOI: 10.1002/fuce.202400095

(18) **The Catalytic Activity of Polyaniline In Hydrogenation Reactions with Molecular Hydrogen**, Bychko I.B., Kurys Y.I., Pariiska O.O., Didenko O.Z., Mazur D.O., Strizhak P.E., Koshechko V.G., Pohodenko V.D., ChemPlusChem, DOI: 10.1002/cplu.202400674

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(20) **Laser-induced optical and structural modification in AgI thin films loaded with silver nanoparticles**, Talebi R., Gigli L., Veltruská K., Nanoscale, DOI: 10.1039/d4nr04598j

(21) **Lipid/ZIF-8 Biocomposites Based on Liposomes or Vesicles: In Situ Formation, and Preliminary Evaluation as Delivery Vehicles for Hydrophobic Drugs**, Cano-Sarabia M., Aydin F., Meng L., Gil-Bonillo M., Fonseca J., Dietrich M., Renner S., Amenitsch H., Falcaro P., Imaz I., Maspoch D., Small, DOI: 10.1002/smll.202407051

(22) **A PVP-stabilized cerium oxide–platinum nanocomposite synthesized in TEG: pro-/ antioxidant activities**, Zholobak N.M., Dubova I.V., Deineko A., Kalinovych V., Novakova J., Matolinova I., Prince K.C., Skala T., Shcherbakov A.B., Tsud N., Nanoscale Advances, DOI: 10.1039/d4na00857j

(23) **Charge Transfer-Driven Conversion of Molecular Oxygen to Doublet State on Vanadium Diselenide (VSe2) Surface at Room Temperature**, Boukhvalov D.W., Stefan M., Joita A.C., Kuo C.-N., Shan Lue C., Politano A., Advanced Materials Interfaces, DOI: 10.1002/admi.202400656

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(26) **Organically Functionalized Mesoporous Silica Network for One-Pot Synthesis of 5-Hydroxymethylfurfural from Glucose in Water**, Kang P., Gabrijelčič M., Krajnc A., Osojnik Črnivec I.G., Likozar B., Sharma R.K., ACS Sustainable Chemistry and Engineering, DOI: 10.1021/acssuschemeng.4c09579

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(48) **Spectroscopic Characterization Using 1H and 13C Nuclear Magnetic Resonance and Computational Analysis of the Complex of Donepezil with 2,6-Methyl-β-Cyclodextrin and Hydroxy Propyl Methyl Cellulose**, Zoupanou N., Papakyriakopoulou P., Georgiou N., Cheilari A., Javornik U., Podbevsek P.,Tzeli D., Valsami G., Mavromoustakos T., Molecules, DOI: 10.3390/molecules30051169

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(55) **Determination of silver(I)-binding sites in canonical B-DNA by NMR spectroscopy**, Lenz T., Javornik U., Hebenbrock M., Plavec J., Müller J., Journal of Biological Inorganic Chemistry, DOI: 10.1007/s00775-025-02115-y

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Abbreviations

BoD	Board of Directors
CERIC	Central European Research Infrastructure Consortium
ED	Executive Director
EGERIC	Commission expert group to assess the implementation of the ERIC Regulation
ERA	European Research Area
EOSC	European Open Science Cloud
ERIC	European Research Infrastructure Consortium, a legal framework created by the European Commission to allow the operation of Research Infrastructures of pan-European interest.
FOE	Fondo Ordinario per il finanziamento degli Enti e istituzioni di ricerca (Ordinary Fund for the Financing of Research Entities and Institutions)
GA	General Assembly
IF	Impact Factor
IL&TT	Industrial Liaison and Technology Transfer
IR	Internal Regulations
ISTAC	International Scientific and Technical Evaluation Committee
MIUR	Italian Ministry of Education, University and Research
OA	Open Access
PaN	Photon and Neutron
PI	Principal Investigator
PF	Partner Facility
RE	Representing Entity
RI	Research Infrastructure
R&D	Research & Development
S&T	Science & Technology
TBAB	Technical Bettery Advisory Board

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Graz and Trieste
www.tugraz.at

Croatian PF: Ion beams at the Ruđer Bošković Institute
Zagreb
www.irb.hr

Czech PF: Surface science at the Charles University
Prague and Trieste
http://spl-msb.mff.cuni.cz/

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www.bnc.hu

Italian PF: Synchrotron and laser light at Elettra Sincrotrone Trieste
Trieste
www.elettra.eu

Polish PF: Synchrotron light and Cryo electron microscopy at Solaris
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www.synchrotron.uj.edu.pl

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