

Central European Research Infrastructure Consortium





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

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CERIC-ERIC

Providing open access to excellent researchers



This is the second annual report of CERIC, which is a fledgling institution by any account. Stemming from the enthusiasm of the first executive director, Prof. Carlo Rizzuto and his colleagues from the political arena, the institution opened doors to instrumentation in mid-2014. Even at the time of its set-up, CERIC stood apart from similar initiatives in Europe. In an area dominated by networks of research facilities, CERIC was a top down initiative, established by the European Commission's implementing decision following the proposal of several countries in Central and Eastern Europe. It did not undergo a preparatory phase. Instead, it started immediately after its formal establishment as a European Research Infrastructure Consortium (ERIC), providing open access to the excellent researchers from around the globe.

A year and a half later we proudly report on the excellent science created

with the help of CERIC, with the first publications in high ranking journals such as Nature Materials. We are observing an increased number of applications, accompanied by more facilities and user time allocated by our facilities to the open access. In addition to excellent science, the institution has consolidated, with the first steps towards joint internal research and activities in the field of communication and industrial liaison, building on the vast knowledge of the institutions involved in CERIC.

While it is still early to report on the various impacts, we can observe some fairly unique achievements of CERIC. It is an international institution providing global free access, while each country focuses on the development of its own complementary facility. Most of the partners have received dedicated national or European structural funding. In this way, CERIC contributes to building synergies among national, structural and European funds, by addressing two objectives of Europe 2020: smart and inclusive growth. While this is certainly an innovative business model, it would not have been possible without the Italian government's funding for the activities of the Statutory Seat.

In conclusion, I would like to express my gratitude to colleagues at CERIC, whose relentless efforts stand behind this year's achievements.

Jana Kolar CERIC Executive Director

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Executive Summary

CERIC-ERIC is an integrated multidisciplinary research infrastructure for basic and applied research in the fields of materials, biomaterials and nanotechnology. Located in 9 countries of Central and South-Eastern Europe (Austria, Croatia, Czech Republic, Hungary, Italy, Poland, Romania, Serbia and Slovenia), it is open to researchers from all over the world through a single open access point the state of the art facilities and techniques based on the use of electrons, ions, neutrons and photons. Each Member Country contributes to CERIC a high quality Partner Facility, which is accessible to researchers, depending on a positive review from the international Scientific and Technical Advisory Committe (ISTAC) of CERIC.

EXCELLENT SCIENCE

In 2015, CERIC increased its scope by consolidating and improving the activities set up in 2014. With excellent science as its main core, CERIC has provided open access to its distributed research infrastructure with two open calls for proposals, re-confirming and improving the results achieved in the previous year and registering a significant increase in the number of applications and of research groups and countries involved. The first scientific results achieved in the first year and a half of operation have been published in peer-reviewed journals, including prestigious ones such as Nature Materials, confirming the excellent quality of the research conducted in the Consortium.

SUCCESSFUL PROJECTS

Researchers who have benefited from the open access have had the chance to enlarge their network by participating in the scientific outreach activities organized during the year, such as the CERIC New Users' Symposium that took place at the National Synchrotron Radiation Centre SOLARIS in June 2015, to exchange results and best practices and to get acquainted with the single- and multi-technique approach of CERIC. CERIC also expanded its network by collaborating with research institutions, universities, regional and EU authorities and industry in applying for regional, national and European funding and for building a common path towards an even more effective integrated open access service and towards stronger cooperation in the fields of research, technology transfer and communication. CERIC has thus detailed the steps of its action plan and has established the basis for joint projects in the future. The first concrete result has been the funding of the project PaGES by the Italian region Friuli Venezia Giulia, to enable pupils from high schools to learn from involvement in a research environment and about the careers that it offers.

CHALLENGES IN 2016

CERIC certainly also faces some demanding challenges in the near future. In 2016, not only will calls for open access be published on a regular basis but the Consortium will also support joint research and the technological development of its Partner Facilities through internal research projects funded with CERIC Research Grants that will be available by applying through the call at the beginning of 2016. In the same year, the strategies needed for the operation of CERIC will be developed and further improved: the methodology for accounting, the framework for monitoring and evaluation of CERIC performance, the communication strategy, enlargement strategy and any other agreements, regulations and procedures needed for the better management of CERIC.

Furthermore, the CERIC staff will take part in the collaboration activities envisaged for contributing to the development of the European Research Area (ERA) and for increasing the impact of CERIC activities through communication and technology transfer.

INTEGRATING ACTIVITIES

In terms of this latter aspect, the grounds for obtaining more effective results in these fields have been established. In 2015, CERIC set up the coordinated activities of the CERIC internal PR and Communication staff and consolidated its network by implementing, and taking part in networking activities at the EU level, in order to share best practices on methods and approaches developed within the Partner Facilities of CERIC and in other institutions.

Participation in regional, national and European conferences and events has also been useful to discuss policy related issues common to ERICs and to research infrastructures.

MANAGEMENT

CERIC had no preparatory phase but started immediately with open access calls and, at the same time, developing the operational basis. In this respect, a new set of internal regulations ranging from human resources to user policy and open access, from procurement to TT and industrial access, were drafted and approved by the General Assembly of CERIC in 2015.

An important step has also been taken in better defining the boundaries, roles and activities of all the entities composing CERIC; with the aim of regulating the mutual responsibilities and obligations in supporting the scientific, technical and administrative operation of the PFs within CERIC and precisely defining the human, financial and instrumental resources that constitute each PF, framework and specific agreements have been signed between CERIC and its REs and PFs.

Furthermore, Hungary and Croatia (Observer Facilities) have made progress in the accession process by offering their facilities to the users' community of CERIC, while Poland intends to join CERIC soon with its newly built Synchrotron at Solaris in Krakow. Only Serbia has to date not registered any progress on the path to full membership. On the other hand, interest in CERIC from facilities inside and outside the Member Countries has been increasing. For example, Fondazione Bruno Kessler (FBK) has started offering open access to its laboratories through CERIC, starting from the second half of 2015. For regulating a standard accession process, CERIC has started to develop its enlargement strategy and methodology,

to be further improved in 2016.

FINANCIAL FRAMEWORK

The financial framework of a distributed research infrastructure such as CERIC, whose operation is strictly related to the availability of in-kind contributions by the Partner Facilities, presents numerous challenges in calculating in the most effective way the exact amount of instrumental and human resources contributed to the Consortium.

As in 2014, the CERIC statutory seat has done a careful job of collecting data related to the in-kind contributions of the PFs in 2015. Starting from 2016, the newly developed *Methodology for defining the values involved in the CERIC-ERIC activities, and to detail the in-kind contributions*, if approved by the EC, will be applied to provide an even more reliable picture of the resources effectively available to the Consortium.

The mission and main purpose of CERIC, in line with the ERIC Regulation (EC No 723/2009), is to establish and operate a multidisciplinary distributed research infrastructure on a non-economic basis.

Mission

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

Vision

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

1. CERIC and its Partner Facilities

CERIC, whose statutory seat is at present hosted by Italy, has been built by integrating leading national research institutes into a unique international infrastructure on a world level. In each country (except Serbia, pending full membership), a Partner Facility (PF) ensures access and outreach to all national scientific communities. Through a single entry point, external users from all over the world can get free competitive access to nearly 50 techniques based on the use of electrons, ions, neutrons and photons for the analysis and synthesis of materials. This new innovative service is also open to commercial users under market-based conditions.

The governing structure involves ministerial representatives of the Member Countries, as well as the directors of the Partner Facilities. 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.

Each Member Country contributes to CERIC by making available and supporting a high quality Partner Facility which is continuously improved by being exposed to international users competing for access through the selection, based on excellence, of their proposals. The Partner Facilities 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.

CERIC's international, pan-European approach, in line with ERIC Regulation EC No 723/2009, avoids duplication and fragmentation in the research system and increases the integration and competitiveness of the European Research Area (ERA), speeding up East-West alignment in the ERA.



The **Austrian facility** (Representing Entity - RE: Graz University of Technology) is dedicated to the structural characterization 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.

The **Croatian facility** (RE: Ruđer Bošković Institute) develops and allows access to ion beam techniques for materials' modification and characterization, such as PIXE and RBS, as well as a heavy ion microprobe, dual beam irradiation chamber with RBS/channeling and TOF ERDA spectrometer.

The **Czech facility** (RE: Charles University Prague) has expertise in surface analysis, thin film growth and studies of the reaction mechanism on catalyst surfaces. It offers Photoelectron Spectroscopy (XPS, XPD, ARUPS) with Low Energy Ion Scattering Spectroscopy and LEED, Field Emission Gun Scanning Electron Microscope, Near Ambient Pressure XPS and access to the Materials Science Beamline at synchrotron Elettra dedicated to soft X-ray photoelectron spectroscopy and NEXAFS.

The **Hungarian facility** (RE: Budapest Neutron Centre) performs and offers R&D in nuclear science and technology, studying the interaction of radiation with matter and doing isotope and nuclear chemistry, radiography and radiation chemistry, surface chemistry and catalysis (PGAA, NAA, RAD). Neutron scattering instruments allow investigation of microscopic properties of solids, liquids, soft materials, biological objects and condensed matter (PSD, SANS, TOF, GINA, MTEST, BIO, TAST).

The **Italian facility** (RE: Elettra Sincrotrone Trieste) covers a wide range of experimental techniques and scientific fields, including photoemission, spectromicroscopy, crystallography, dichroic absorption spectroscopy, x-ray imaging etc.

The **Polish facility** (RE: Polish Ministry of Science and Higher Education) offers techniques based on synchrotron radiation: the PEEM/XAS beamline (200-2000 eV photon energy range) is equipped with PEEM - Photoemission Electron Microscopy - and XAS, devoted to spectroscopy studies by absorption of soft X-rays. The UARPES undulator beamline (8-100 eV photon energy range) is equipped with the ARPES endstation, allowing precise studies on the structure of energy bands of solids and their surfaces.

The **Romanian facility** (RE: National Institute of Material Physics) offers access to HRTEM and EPR laboratories for research in solid state physics and materials science, including the synthesis and characterization of advanced materials for applications in microelectronics, catalysis, energy industry and ICT.

The **Slovenian facility** (RE: 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.















Image: Drop of ethanol by Tomáš Duchon - Charles University Prague (CZ) Artistic visualization of a drop of ethanol at the molecular level

2. Excellent Science

CERIC's main aim is to contribute to the creation of excellent science, both as in-house activity and as a service to international users. This is achieved mainly by providing open access to its research facilities. The section Achievements reports the results in this domain.

Main achievements in a nutshell

- Development and improvement of the open access model of CERIC-ERIC.
- Implementation of 2 calls for users with an increasing response from users for a total of 108 submitted applications (equivalent to 220 single instrument accesses) from 23 countries.
- First publications of the results of research projects based on CERIC open access.
- Organization of the 1st New Users Symposium focused on the CERIC single and multi-technique research approach.

Open Access

CERIC integrates human and instrumental resources into a unique scientific multinational asset, guaranteeing open access to a wide variety of geographically widespread scientific and technical services, distributed in Central and Eastern European Countries.

Access to CERIC is open to researchers from all over the world through **two calls for proposals per year**. It is free of charge for non-proprietary research requiring access to **one or more techniques**, accessible in **a single step**. In exchange for the free access, the users are required to share their achievements through the **publication of the results** of the experiments, with appropriate references to the CERIC facilities and to the local scientific and technical staff involved. Proposals are submitted online through the specific online platform. The best ones are selected by peer review through an **independent and international panel** of experts whose choice is based solely on excellence.



In 2015, CERIC improved its application process by offering a **two-stage deadline option**, which allows increasing the success rate of proposals submitted by users less familiar with the techniques for which they are applying. The first deadline is dedicated to a pre-evaluation, followed by technical feedback allowing improved projects to be submitted by the second deadline. Expert users may submit their proposals directly bythe second deadline. The evaluation takes into account both the technical feasibility and the scientific quality of the proposals.



In addition to the introduction of the two-stage process, the platform for the evaluation and selection of the international proposals has been consolidated and further developed.

2 calls for proposals, 108 proposals received, research groups from 23 countries, 66 multi-disciplinary proposals selected In 2015, CERIC opened and implemented two calls for proposals involving research groups from 23 countries, which is a significant increase over 2014. One hundred and eight proposals were received – equivalent to 220 proposals for the use of a single instrument (Figure 1) – and 66 were selected – equivalent to 125 projects requiring the use of a single instrument. A decrease in the number of the requested instruments was observed in the last call, due to the innovative introduction of the possibility of submitting single instrument proposals for techniques that do not have other channels of open access available.

The following tables show the data extracted from the calls performed by CERIC in 2014 and 2015:



Number of proposals received per call





As shown in Figure 2, the number of proposals received substantially increased in 2015, with nearly 47% more requests than in 2014. In 2015, as in the previous year, the majority of proposals requested the use of two instruments. Requests for more than two techniques for a single proposal were less frequent but still crucial for a significant number of research projects (Figure 3).



Figure 2 – Successful vs. received proposals per call Figure 3 – Number of instruments requested per proposal in each call (2014-2015)

In 2015, there was an increase in the number of successful proposals (66 vs. 33 in 2014), which was also due to the increase in instrument time allocated to open access in 2015, over that available in 2014. This is also reflected in the annual accounts of 2015.

Most proposals were submitted by researchers from Italian institutions. Nevertheless, in comparison to the previous year, many countries were added to the list: Argentina, Belgium, Egypt, France, Greece, Latvia, Pakistan, Poland, Russia, Spain and the Netherlands, for a total of 23 countries involved (Figure 4). These data show that CERIC successfully delivers on the aim of involving international researchers, fostering their mobility, the exchange and transfer of knowledge and the creation of a worldwide network.



Scientific publications

Several of the projects supported by CERIC through the open access have produced relevant new scientific results. Some examples are shown in the following:

New findings on the effects of impurities on catalytic combustion open the way to the production of cleaner energy¹.

The catalytic combustion of methane (CH4), the main component of natural gas, is a crucial process for the production of clean energy. Common catalyzers usually contain palladium (Pd) – a very effective but expensive noble metal – and cerium oxide (CeO2) nanoparticles on graphite. The main problem of these catalyzers is the so-called poisoning caused by impurities such as phosphorus (P) in the methane. Phosphorous chemically connects with CeO2, "blocking" the catalyzer and preventing it from doing its work. Although this fact was already known, the exact way in which phosphorous acts is still to be discovered. **Matteo Monai** (University of Trieste) and his colleagues shed some light into this matter and performed a fundamental investigation on the mechanism of phosphorous poisoning of catalysts.



The CERIC user Matteo Monai

The researchers prepared a model catalyzer system and exposed it to phosphorous under various conditions. The behavior of the system was studied by a unique combination of techniques, all offered by CERIC: Synchrotron Radiation Photoelectron Spectroscopy, (XPS) Scanning Electron Microscopy (SEM) and X-ray Absorption Near Edge Structure (XANES).



Figure 5 – 20 m viewfield SEM images and EDS mapping of Pd, Ce and O signals of fresh Pd@CeO2/graphite (top row) and Pd@CeO2/P-graphite (bottom row) samples

The study led to the conclusion that phosphorous itself only lowers the performance of the catalyzer, rather than destroying it completely. Only in combination with water vapor does it leads to coagulation (clotting) of the CeO2 nanoparticles, which "lock-up" the palladium and completely deactivate the catalyzer. Understanding this mechanism can be used to design more stable catalytic systems, increasing the chance of tackling relevant environmental issues in the future.

> ¹ M. Monai, et al., Phosphorus poisoning during wet oxidation of methane over Pd@CeO2/graphite model catalysts, Appl. Catal. B: Environ., 2015, http://dx.doi.org/10.1016/j.apcatb.2015.10.001

Electron counting paves the way to tailor-made catalysts²



The CERIC user Yaroslava Lykhach

The widespread use of nanoparticles in modern production is due to their unique properties, ensuring efficiency and the saving of resources. They find application in almost all areas of technology from electronic components to solar cells. Catalysts made of noble-metal nanoparticles placed on a rare-earth support material are among the most common catalysts and are used in many areas, from the production of chemicals to the cleaning of exhaust gases in cars.

The development and design of cost-effective catalysts that make efficient use of these precious materials require a fundamental understanding of the chemical interaction between the nanoparticles and the support material.

One commonly known mechanism is the exchange of electrons from the nanoparticle to the support material on which they are placed. This transfer of electrons changes the chemical structure of both the particle and the support material and therefore influences the catalytic activity. Nevertheless, previous studies have not investigated how much charge is transferred and whether there is a relationship between the transfer and the size of the nanoparticle.



Figure 6 – The two curves show the number of electrons transferred per particle (green) and the number of charges per atom transferred (yellow) depending on the particle size and number of atoms, respectively. The maximum transfer capability was found at particles between 1.2nm and 1.8 nm in size containing between 50 and 80 atoms per particle.

The CERIC user **Yaroslava Lykhach**, from the Friedrich- Alexander University Nuremberg-Erlangen (Germany), and an international team of scientists from the Charles University in Prague (Czech Republic), the CNR-IOM DEMOCRITOS (Italy) and the University of Barcelona (Spain), succeeded for the first time in counting the electrons that are lost by a platinum (Pt) nanoparticle when it is placed onto a cerium oxide (CeO2) support in a model catalyst. In their study, which was recently published in the prestigious scientific journal *Nature Materials*, the researchers used several highly sensitive photo-electron spectroscopy (XPS) techniques offered by CERIC, in combination with theoretical calculations. By measuring the electrical charge exchanged, they found that the amount of transferred electrons is strongly dependent on the nanoparticles' size. This information helps in determining the optimal size of particles to maximize the catalytic activity and to bring tailor-made catalyzers one step closer.

² Lykhach, Y. et al., Counting electrons on supported nanoparticles, Nature Materials, 15, 2016, 284-288 (published online Dec. 2015), http://dx.doi.org/10.1038/nmat4500

A clearer understanding of the role of zinc in glass structure brings the optimization of electronic displays a step forward³.

Glasses are traditionally based on silicon (Si) but can also be formed by other elements such as boron (B) and molybdenum (Mo). This is the case with boromolybdate glasses, which can be doped with other elements to change their properties. These glasses also contain zinc (Zn) and in comparison to traditional silicon based glasses, they have high electrical conductivity and a lower melting point. This makes them interesting for applications in consumer electronics such as TVs and smartphone touch displays. Although boromolybdate glasses are already widely used, some questions on their atomic structure are still open. In particular, the exact role of zinc within the glass was not yet completely clear. The basic theory claims that the main structure is formed by boron and molybdenum. Zinc plays the role of a modifier which only influences the structure without being part of it.



The CERIC user Margit Fabian



Figure 7 – TEM images of 30MoO3–50ZnO–20B2O3 glassy sample

Margit Fabian, from the Hungarian Academy of Sciences, recently found evidence that contradicts this theory. In her study, supported by CERIC-ERIC, she used Neutron Diffraction, High Resolution Electron Microscopy and Solid-State Nuclear Magnetic Resonance together with computational simulation methods, to reveal the structure of several zinc-boromolybdate glasses with different compositions. The study, published in the *Journal of Non-Crystalline Solids* not only produced precise structural data, but also revealed that zinc plays an active role in forming the structure and it is also fully incorporated. This new information is an important step towards deeper understanding of this interesting class of materials and helps to further optimize the glasses for a potential application.



³ M. Fabian, E. Svab, K. Krezhovc, Network structure with mixed bond-angle linkages in MoO3–ZnO–B2O3 glasses: Neutron diffraction and reverse Monte Carlo modelling, Journal of Non-Crystalline Solids, Vol. 433, 2016, 6–13 (published online Nov. 2015), http://dx.doi.org/10.1016/j.jnoncrysol.2015.11.023

Scientific Outreach and Communication to Users

One of the major activities needed to reach the best researchers and to increase the impact of the available infrastructures is outreach and support to new users in understanding the potential advantages offered by CERIC.

In June 2015 CERIC, in collaboration with the Polish Partner Facility, the new Polish Synchrotron Radiation Facility Solaris in Krakow, organized the CERIC New Users' Symposium 2015, focused on the CERIC single and multi-technique research approach.



Participants of the CERIC 1st New Users Symposium 2015

The symposium aimed at helping new users to get acquainted with the structure and opportunities of a distributed research infrastructure, and with the demands to be met for a successful CERIC multi-technique proposal, to increase the quality of the proposals received and of the research projects. The event hosted almost 50 participants, who were introduced to the complementary methods of the CERIC Partner Facilities by beamline and instrument scientists and experienced CERIC users. The participants also presented their own single- and multi-technique research in poster sessions and participated in Q&A sessions.

Following the advice of the International Scientific and Technical Advirsory Committee (ISTAC), CERIC also started to address different user communities and institutions. CERIC, its single- and multi-technique approach, as well as its particular multi-sectorial open access and peer-review procedure were presented to the FP7 project CALIPSO and NMI3 and at the International Conference on Ion Beam Analysis.





Image: Fish in fish by Josip Barišić - Ruđer Bošković Institute (HR) Histological image of channel catfish liver

3. Projects

Activities not directly supported as the core ones but contributing to the aims of CERIC are addressed through projects. This section reports on the main activities in 2015 in this domain.

Main achievements in a nutshell

- Proposal submission to various European and regional funding programs (Horizon 2020, ERDF, Italian region FVG funds).
- Implementation of the project *PaGES: Planning, Management and Execution of a Scientific Experiment in an international research infrastructure,* for high schools, funded by the Italian region Friuli Venezia Giulia.

During 2015, CERIC applied to several calls for European, as well as regional funds, involving partners from both the research and the industrial environment and making an effort to find synergies across different programs, calls and projects.

CERIC also successfully implemented the project PaGES.

PaGES project

The project PaGES allows guiding high school pupils through the planning, management, execution, evaluation and dissemination of the results of a scientific experiment. Funded by the Italian region Friuli Venezia Giulia, it covers the period October 2015 - September 2016.

PaGES gives an opportunity to pupils to learn about the different stages of a scientific project. By carrying out all the steps of a scientific experiment, over 60 students are acquiring the basic tools for the planning, management, execution, evaluation and dissemination of the results of a research project. Three different schools from the funding region are getting the know-how and the direct experience of an international research environment such as CERIC and are actively participating, by interactively working in groups, in the process of shaping a research idea into an actual experiment. They are also learning how to communicate the results obtained and how to present the project's outcomes to the student communities to which they belong.

The project contributes to strengthening the links among high schools in the regional area and establishes the basis for implementing similar actions in the future, even across the other CERIC countries, to let pupils have hands-on training sessions in the labs in which the research takes place and to empower them to make more conscious choices for their future career.





Participants at the PaGES' kick-off meeting - 22 October 2016 - Trieste

The foreseen project's activities include 7 sets of events:

- Project kick-off meeting;
- Introduction to PaGES and to project management (one training course in each school partner);
- Description of scientific topics linked to an experiment to be held in CERIC laboratories (one training course in each school partner);
- Hands-on training and development of an experiment using the techniques available in the CERIC laboratories at Elettra;
- Data analysis, science communication and introduction to technology transfer (one workshop in each school partner);
- Dissemination of the project's results to the student communities of the school partners (one event per school partner);
- Final project meeting for planning future joint collaboration and action.

The Region's contribution amounts to 15.000 euro and at least 10% of the total value of the project will be covered by the project coordinator, i.e., CERIC-ERIC. The company Kyma s.r.l., based in Trieste, will cofund the project to a total amount of around 1500 Euro. The other partners are Liceo Scientifico Albert Einstein (Cervignano del Friuli), Liceo Scientifico Duca degli Abruzzi (Gorizia) and Liceo Scientifico Galileo Galilei (Trieste).



Planning, Management and execution of a Scientific Experiment in an international research infrastructure

The project idea was developed in response to a call of the Region, within the area "Education and Research" and within the program "Regional plan for the building up of the formative offer for the academic year 2015/2016", in the section "Special projects". The project's objective is coherent with CERIC's goal of stimulating and supporting interdisciplinary training.





Image: Tennis Ball by Raluca Negrea - National Institute of Material Physics (RO) Scanning electron microscopy image of Eurygaster bug egg

4. Challenges for 2016

The challenges for 2016 address some of the pressing topics of CERIC. Foremost, we will continuously strive to deliver excellent science, to develop CERIC as an institution and to contribute to policy development. Education, communication and industrial liaison activities will also be in focus in 2016.

Main challenges in a nutshell

- Implementation of calls for open access
- Publication of the Call for CERIC Research Grants.
- Implementation of a new methodology for accounting.
- Set-up of a framework for monitoring, evaluating and implementing the enlargement strategy.
- Set-up of the CERIC Communication Strategy.

5.1 Excellent Science

CERIC calls for open access

Two CERIC calls for open access will be published and implemented. The service and its quality will be evaluated through the user satisfaction survey and through the feedback from international scientific and technical reviewers. The recently adopted innovative system, consisting of submission in two stages (preevaluation, editing and final submission) will be further tested. These results will be presented to the Board of Directors and ISTAC. The approach will enable continuous development of and upgrading the quality of the service provided by CERIC.

Internal Research

Any research infrastructure aiming to have an impact at the international level must have high quality inhouse research, in order to be capable of developing new resources and approaches in a competitive way. The first CERIC call for research grants, supporting joint research and technological development of the CERIC partner facilities, will be published.

Internal research is also essential for ensuring the high quality of the support offered to researchers through the distributed CERIC staff. In the case of a distributed research facility, shared between various countries, the internal research should also aim for increased integration of national facilities into a unique, EU-level Distributed Research Infrastructure. There are many other benefits stemming from multi-national internal research, ranging from the specialization of CERIC for certain societal challenges to bridging the gap in excellent science between CERIC partners.

CERIC fellows, who are part of the internal staff, will also submit internal research projects, which will be implemented only if the international evaluation is favorable.

Involvement of new user communities

CERIC will be presented and its approach will be explained at several scientific events planned in 2016, in order to broaden the user base and to collect new ideas from potential new users.

5.2 Management

CERIC started its operation in 2014, following the European Commission's Implementing Decision, without a specific preparatory phase, except for call zero carried out before the official set-up of the consortium. Its operation, as well as the integration of the Partner Facilities contributed in-kind by the participating countries, is still unique and it will continue in 2016 with the development of the strategies, regulations and agreements needed for its operation. The main activities will focus on the following:

Methodology for accounting

The methodology for defining the values related to specific in-kind resources and activities will allow annual reporting of CERIC that will refer to both the quality and the values. This will also allow monitoring of the development of CERIC. The methodology for evaluation of in-kind contributions will be submitted to the Commission for an ex-ante assessment in compliance with the requirements of the Model Grant Agreement for large research infrastructures. A wider effort to account for and to evaluate the exchanges of values between the CERIC partners and international users will be ongoing.

Framework for monitoring and evaluation

A first draft of the monitoring and evaluation strategy will help to improve the performance and to achieve the aims of CERIC. It will also demonstrate the effectiveness, efficiency and accountability of CERIC.

Communication strategy

CERIC will review communication strategies and activities, comparing them with those of similar institutions, followed by the development of its own Communication Strategy.

Enlargement strategy and implementation

The CERIC Statute and the EU approach indicate that an ERIC should always strive to be open to new members and experiences. This is an important aspect that needs to be approached with a strong and clear understanding. A document is being prepared for this purpose.

The document will detail the approach to enlargement (also through the outreach and the inclusion of new techniques and resources by PFs within the Member Countries) and will also include the methodology to be followed for the accession of new members to ensure transparency of the process.

Agreements, regulations, internal procedures

This is an ongoing activity, which requires building on the experience that is now being accumulated. These activities will contribute to the better management of CERIC and will involve the conclusion of agreements with partner institutions (e.g., Solaris), the establishment of CERIC seats in partner member states and the improvement of internal communication procedures.

5.3 CERIC in ERA

CERIC will contribute to the development of the ERA through active participation in organizations/activities such as the ERA stakeholders group, the Association of European-level Research Infrastructure Facilities (ERF), the ERIC network, and it will actively contribute to the RESAVER program. Support to specific initiatives such as the RESAVER pension fund is part of a strategic approach. Contribution to a better understanding of the sustainability and the socioeconomic returns of research in the ERA is another important element.

5.4 Communication, technology transfer

CERIC will take part in collaborative activities in the representing entities (i.e., ERF, ERICs network, ERA, etc.) and it will offer support to the ministries when required. It will also interact with the EC in several policy-making efforts. The efforts made concerning the applicative knowledge and the projects' exchange among PFs, REs and worldwide companies for IL&TT activities will continue. CERIC web pages and a brochure dedicated to IL&TT will be prepared.



5. Integrating Activities

CERIC is a distributed research infrastructure, operating in various countries. As a single legal entity, it has as a structural objective integrating partner institutions by, for example, joint research projects - as described in the section on Challenges for 2016 - as well as by developing a common strategy and policy relating to domains such as industrial liaison, intellectual property and communication. This section describes the integration activities undertaken in 2015.

Main achievements in a nutshell

- Implementation of networking activities among IL&TT contact points in PFs and REs, to share best practices on methods and approaches developed within PFs and in other institutions, and to define a common framework for delivering integrated access through CERIC.
- Set-up and consolidation of Communication, IL&TT and CERIC users' networks.
- Set up of coordinated activities of the CERIC internal PR and communications staff.
- Presentation of CERIC activities and best practices to other European Research Infrastructures at international conferences, meetings and events, also involving the Synchrotron, Ion- and Neutron beams communities interested in the CERIC paradigm.

IL&TT Network

During 2015, meetings, brainstorming sessions and discussions took place among the IL&TT staff from CERIC and its PFs – in Magurele (RO), Graz (A), Ljubljana (SLO), Prague (CZ), Budapest (HU), Trieste (IT) and Zagreb (HR) – to set-up future joint actions and a work plan for the upcoming years.

The basic idea has been to involve the IL&TT staff of PFs REs concretely and thereby to build and strengthen a sustainable and collaborative network of TT experts aimed at developing and improving a set of integrated services to industry in the Central Eastern European area.



Participants of the 1st CERIC internal workshop on IL&TT

A first step towards this goal was the **1st CERIC internal workshop on IL&TT**, which took place in October 13th-14th 2015 in Budapest, Hungary. The members of the CERIC community, together with several experts from other European Research Infrastructures, met to share their experience, as well as concrete examples of applied research transferred to the industrial realm. The shared expertise is expected to allow building and defining an integrated IL&TT facility within CERIC.

CERIC Communication Network

The distributed CERIC communication team, composed of press and communication officers from each Partner Facility in CERIC, met for the first time in 2015 in plenary hands-on working sessions, taking the first step towards more effective collaboration in the future.

The goal of the **internal workshop on communication** that took place in Ljubljana in April 2015 was to focus and share an understanding of CERIC-ERIC's specific identity as a distributed and integrated research infrastructure, and to identify the diverse target groups inside and outside the Consortium, as well as their main needs. The group reflected on the tools available for sharing internal issues and for spreading information to the most relevant stakeholders.



CERIC distributed communication team

Through a participative exchange and discussion, the team shared the vision and understanding of CERIC, getting to a shared focus in the communication objectives to be achieved, with the final outcome of creating commitment among all the participants to CERIC and to its communication needs.

The two-day workshop was a successful starting point for establishing the distributed CERIC communication team, for outlining an internally coherent corporate identity and for enforcing the values of CERIC's culture.

Policy related issues, outreach and the general public

- **ERIC network**: The second meeting was organized in Trieste by CERIC on December 2014 and it has now developed into a well established bi-annual event addressing topics relevant for ERICs (both single sited and distributed), including governance, human resources management and tax exemption. Moreover, CERIC is actively promoting the establishment of a more permanent and structured ERIC Forum.
- **ERF**: The European Association of National Research Facilities with open international access was initiated in 2007 to promote cooperation among individual European national large-scale research facilities. CERIC took part in the ERF-AISBL Workshop on Public Awareness of Research Infrastructures in June 2015.
- Energy for Sustainable Science at Large Research Infrastructures: This workshop was the third event in the series that was organized by ERF, CERN and ESS holding biennial workshops at various places. Carlo Rizzuto, executive director of CERIC-ERIC, was a member of the organizing committee.
- **RESAVER**: Resaver, which has been proposed with the strong support of the EU Commission, will be a state of the art retirement savings product that will enable mobile and non-mobile employees to remain affiliated to the same pension vehicle when moving between different countries and changing jobs. At the same time, RESAVER will lower asset management charges and provide better access to high quality investments. CERIC is one of the members of the steering committee.
- **INARIE** (Integrating Access to Pan-European Research Infrastructures in Central and Eastern Europe), Debrecen, HU, Nov 30-Dec 1st: A conference dedicated to Research Infrastructures in the general context of international collaboration in particular Integrating Access to Pan-European Research Infrastructures in Central and Eastern Europe. Carlo Rizzuto presented the talk *The international integration of national efforts in Research Infrastructures in Central East Europe: the case of CERIC-ERIC.*
- Meeting with the members of the Research Working Party: On October 14th 2015, CERIC organized in Brussels an informal meeting with the Scientific Counsellors of the Permanent Representations in Brussels of the country members of CERIC. During this meeting, hosted by the Representation Office of the Italian region Friuli Venezia Giulia, Fabio Mazzolini (CERIC Deputy Director for the EU and International Relations) presented some recent developments of the Consortium.
- **Presentation in Serbia**: In the frame of the "Italy-Serbia Day: Growth & Development through Science & Technology" workshop, organized in Belgrade on November 16th 2015 by the Italian Embassy, CERIC was represented by Carlo Rizzuto with the talk "Implementing CERIC-ERIC: its first year of operation".
- Collaboration with Bosnia and Herzegovina: Following the meeting organized by CERIC in Sarajevo on December 2014 with the support of the Italian Embassy, of the Bosnian Ministry for Civil Affairs and of the University of Sarajevo, further collaborative contacts were developed in 2015, with a view to preparing a new workshop in Bosnia and Herzegovina, possibly to be held at the end of this year.

 Presentations to the general public: CERIC collaborated with Elettra for the realization of the Festa della Luce, a whole day in which Elettra and the CERIC laboratories in the Italian RE were opened to the public, organized within the International Year of Light. CERIC and Elettra worked jointly for the organization of another important event for outreach and dissemination to the public: Trieste Next, which took place in the center of Trieste on the day of the EU Researchers' Night. CERIC was hosted in Elettra's booth and organized a seminar to present the most successful case studies developed thanks to CERIC-ERIC.



CERIC at the public event Trieste Next 2015



The CERIC user Alfredo De Biasio presents its research to the public at Trieste Next 2015



The Deputy Executive Director of CERIC, Ornela De Giacomo, presents CERIC to the public at Trieste Next 2015



The CERIC user Alfredo De Biasio presents its research to the public at Trieste Next 2015

6. Management and Finance

Main achievements in a nutshell

- Amendments to some of the Internal Regulations to make them more appropriate and practical for the scope and needs of CERIC and of its stakeholders.
- Signature of Framework and Specific Agreements between CERIC, REs and PFs.
- Set-up of a common framework for evaluating the impact of CERIC.
- Collection of data about in-kind resources for ordinary and user-related activities of PFs and for their upgrade.
- Development of the Methodology for defining the values involved in the CERIC-ERIC activities, and to detail the in-kind contributions of an innovative methodology – to be approved by the European Commission – for the evaluation and accounting of in-kind contributions of the host country and members and of the resources for the CERIC distributed institutional activities.
- Approval of the VAT exemption regime by the Italian Revenue Agency, to be applied to purchases processed for CERIC by the Italian State through its Italian RE.
- Development of the financial and in-kind annual account for 2015 and estimation of the auditable values to be included in the Annual CERIC Account.
- Approval of the CERIC budget 2016.

Internal Regulations

The way in which CERIC operates is a learning process and, as agreed early-on by the General Assembly, its internal rules and procedures are subject to revision based on experience.

In 2015, the GA of CERIC-ERIC approved the following Internal Regulations (IRs):

- Human Resources;
- Users Policy, Open Access, Proposal Review Panel;
- Intellectual Property, Industrial Liaison, Technology Transfer and Industrial Access;
- Procurement and Pre-procurement;
- Risks and Liabilities.

The GA also amended the Internal Regulations about the *Executive Director* and about the *Independent Audit Expert Committee and the Independent Auditors*.

The Internal Regulation on IL&TT was further developed and signed by all PFs. In particular, it was agreed that PFs, when acting on behalf of CERIC, will act as TT national entry points to companies interested in CERIC integrated services, to allow easier access and a more efficient service. Once specific industrial cases will arise, specific regulations will be agreed upon, in order to customize the offer and better to address customers' needs.

Framework and Specific Agreements

Framework Agreements between CERIC and the REs of Austria, the Czech Republic, Italy, Romania and Slovenia have been signed to regulate mutual responsibilities and obligations in supporting the scientific, technical and administrative operation of the PFs within CERIC. The Framework Agreements define the characteristics, role and responsibilities of each PF and the procedures through which the related RE will commit the resources necessary for the operation of the PF and for guaranteeing access and service to scientific and industrial users, coherently with CERIC's Statute and Internal Regulations. It thus sets the framework within which REs will contribute in-kind, through the PF, the resources required to ensure its operation as an entry point for both the national scientific community and international users. The declared commitment is also related to the joint development of applied and industry-related activities, training of human resources, communication and data management, with the aim of achieving common strategic objectives, purposes and access capabilities.

Furthermore, Specific Agreements between CERIC and PFs in the member states have been signed to define the human, financial and instrumental resources that constitute the PF. These data are further detailed in the annexed PFs report and in the 2015 account, following the joint methodology described in the following paragraphs.

CERIC Enlargement

In 2015, the accession process of the observer countries in CERIC-ERIC continued. The instruments and laboratories in the proposed facilities were made available to the scientific community in the implemented calls for proposals: Croatia successfully offered techniques for analysis with accelerated ions; Hungary offered its neutron based techniques; Poland set-up the new Synchrotron SOLARIS which will soon be contributed to CERIC. Only Serbia registered no progress.

The involvement of other international entities (also universities) was consolidated. In particular, the Bruno Kessler Foundation (FBK) made available, as an additional in-kind contribution, international access to some of its infrastructures, which have contributed to attracting a higher number of international users.

CERIC also received requests from several institutions to consider their inclusion in the CERIC open access offer. In order to proceed with the enlargement, it was decided to prepare an enlargement strategy and methodology, which will ensure transparent expansion on the one hand, and the highest quality of new instrumentation on the other. Framework agreements signed between CERIC and the REs to regulate mutual responsibilities and obligations in supporting the CERIC PFs

Specific agreements signed between CERIC and the PFs to define the resources that are part of the PFs

New instruments and labs have been made available to the research community in 2015

> New requests received to join CERIC

Evaluation of In-Kind Contributions

The CERIC statutory seat collected joint data related to in-kind contributions of the PFs in 2015 through the existing administrative staff distributed in the PFs/REs and the Observers. This process has also been useful for strengthening the CERIC administrative network.

A new methodology has been developed for evaluating in-kind contributions Owing to the many challenges faced in the data collection process, the CERIC management developed a new methodology (to be applied starting 2016) for the evaluation of in-kind contributions, having the scope to allow the correct representation and evaluation of the activities held, as well as the certified accounting of the values involved. First of all, the activities and the resources (human, instrumental etc.) of the PFs are specifically listed, defined and described. It is then explained how to distinguish in-kind contributions from the sum of the overall resources available to PFs.

By applying this methodology, in the future it will be possible to evaluate:

- The overall ordinary and project-related scientific and technical activities of PFs, as well as those developed within the CERIC integrated activities as a subset of the PF's overall ones;
- The values of the resources used and/or acquired in developing the ordinary activities of the PFs, those for common S&T activities and projects involving other PFs, and those for the support of common operational activities of CERIC.

VAT Exemption Regime

Purchases made for CERIC by the Italian State through its Italian RE will be processed in the VAT exemption regime CERIC has received the Opinion of the Italian Revenue Agency regarding the VAT treatment applicable to purchases of goods and services made by Italy through its RE - Elettra-Sincrotrone Trieste S.C.p.A., which are intended to constitute an asset of CERIC. The Italian Revenue Agency adopted an important precedent confirming the right to extend the VAT exemption regime – provided for by articles 143(1)(g) and 151(1)(b) of Directive 2006/112/EC - to the purchases of goods and services made by the CERIC Member - Italy through its RE in favor of CERIC-ERIC. This Opinion enables the reasoning to be shared and used in dealing with the authorities competent for VAT exemption in other CERIC Members.

Audit and Financial Data for 2015

The amounts of the in-kind contribution to CERIC by all REs/PFs have been accounted and directly reported as part of the annual financial statement of CERIC and it has been submitted to CERIC auditing. The auditors of CERIC and the REs have met to ensure the alignment of procedures and of the way in which data and activities are presented.

Notes to the financial statements as at December 31, 2015

Foreword

On June 24, 2014 President José Manuel Barroso signed the European Commission decision that established CERIC-ERIC, the European Research Infrastructure Consortium for analytical and synthesis facilities for the life sciences and nanotechnology in Central Europe.

Members of the Consortium, together with Italy, are Austria, Czech Republic, Romania, Serbia and Slovenia. Croatia and Hungary have been accepted as Observer Facilities by the General Assembly, having activities already accepted through scientific evaluation. Prior to the end period of these financial statements, Poland was admitted as a Member of CERIC by resolution of the General Assembly on October 12-13, 2015 pursuant to the internal by-laws.

The registered office of the Consortium is in Trieste and is currently housed c/o the Research Centre Elettra Sincrotrone Trieste, in the AREA Science Park.

The Consortium is an ERIC (European Research Infrastructure Consortium) and is a distributed research infrastructure based on European Regulation 723/2009: this brings together, in a closely integrated institution, built to operate at the highest levels of quality and with the guarantee of open access for external users selected on the basis of quality, the best specialized centres and laboratories of the participating countries.

This distributed research facility, therefore, operates with active nodes in Austria, the Czech Republic, Italy, Romania, Slovenia, as well as in Hungary and Croatia and is open to other interested countries. Serbia has not yet proposed its facilities.

The specific scope of this ERIC concerns the operation of these nodes at the highest scientific level and the integration of their offer as a unique service to external basic and applied researchers, consisting of access to photon, electron, neutron and ion based techniques notably for materials preparation and characterization, structural investigations and imaging in Life Sciences, Nanoscience and Nanotechnology, Cultural Heritage, Environment and Materials Sciences and to their various technological and industrial outcomes ranging from energy to biomedical and those of interest to most manufacturing industries.

CERIC's mission is to bring the integrated service to world-level quality, thus contributing to the attractiveness of the European Research Area and stimulating a beneficial impact on the scientific and economic development of the entire region, also helping to introduce a strong interchange between scientists and technicians and to attract scientists from other regions.

Accounting criteria

The present annual financial statements have been compiled in conformity with the international accounting standards IAS/IFRS in force on 31 December 2013, issued by the International Accounting Standards Board (IASB) and adapted by the European Commission within the meaning of Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards, as well as with the related interpretations by the IFRS Interpretations Committee (IFRIC).

The decision voluntarily to adopt an accounting system that can be connected to international principles has taken into account the process of harmonization started some time ago within the EU Commission, not yet completed, managed by the ARC (Accounting Regulatory Committee) and by the EFRAG (European Financing Reporting Advisory Group).

CERIC-ERIC is set up as an international organization and should therefore be able to relate to its Members, who are 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 matters, which support the annual accounts and budgets.

The use of the International Accounting Standards, taking into account the specific character and scopes of CERIC-ERIC, can allow the development of well-defined best practices whose impact 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. In this way we can ensure that:

- the information is relevant, reliable, comparable and understandable;
- the terminology used is common, appropriate and explanatory among Members and for similar international organizations outside Europe;
- the financial statements are auditable by International Standard of Audit

of auditors from different nations;

- the host country change and thus any site change- is not relevant for the comparability of information and models, books, records of the accounting system;
- the accounting system is able to present the in-kind contribution model, 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 ownership 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, integrated in order to be consistent with the legal and effective structure and scopes of CERIC.

The Consortium, among the various options allowed by IAS 1, 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 expenses by their 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 assets or liabilities;
- Only incomes and expenditures related to the financial year have been accounted, independently of the day of encashment or payment;
- The risks and losses related to the financial year have been accounted for, on an accrual basis, even if known after the end of the financial year.

These Notes have been compiled in order to clarify, complete and analyse the information contained in the assets and liabilities balance sheet and in the profit and loss account, in addition to providing information on the applied evaluation criteria, on the movements that have taken place and the changes in various assets and liabilities.

The Notes are an integral part of the financial statements and provide descriptive and schematic information with particular reference to the ownership aspects as well as economic and financial aspects of the overall management.

The financial statements comprise the following parts:

- Balance sheet, assets and liabilities;
- Profit and loss account;
- Explanatory notes;
- Management report.

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 ownership 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, where applicable according to the legal characteristics of a not for profit institution and the specific scope of CERIC.

Balance sheet

The items in the balance sheet are classified into current/non-current.

Assets

The assets have been classified as current assets when:

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

The assets realizable within the operating cycle have been classified as current, regardless of whether they have been actually realized within 12 months from the balance sheet date.

The non-current assets include tangible assets (computers and other minor electronic tools), 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 as current liabilities when:

- They are extinct in the course of the normal operating cycle of the institution;
- The 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 non-commercial 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 for the year 2015 and not yet fully used, following the accrual basic principle, by 31.12.2015 for the purposes they were intended. They will therefore be used in coming years for the same purposes.

This item represents the carry-over for balances of subsequent years to that under review. In this regard, the Consortium is obliged to operate in future years in fulfillment of the mandate requested by the General Assembly in compliance with the scope designated by the Italian Ministry of Education, University and Scientific Research as Member contributing the funds.

In-kind contributions

Contributions in kind will be acquired in the financial statements on the basis of the details contained in the document entitled " Methodology for Defining the Values Involved in the Ceric-Eric Activities, and to Detail the In-kind Contributions", under the conditions specified therein. Due to the need to consolidate the above mentioned "Methodology", it was not possible to proceed to comparison of the data, to be referred to as in-kind contributions attributed to CERIC, between local auditors (entrusted by each RE/PF) and Ceric auditors. The in-kind contributions, relevant for the 2015 financial year are listed as supplementary information included in these Notes in the ad hoc unaudited appendix.

Profit and loss account

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

Incomes

Incomes are increases of the benefits connected to the administrative year.

Costs/Expenses

Costs/expenses are decreases of the economic benefits of the administrative year.

The analysis of the costs has been explained in the overview of the profit and loss account using a classification based on their nature.

In-kind contributions

In-kind contributions, based on IAS 20, will be distinguished (when realized) between:

i) Contributions of a non-monetary nature/"in-kind" stated among incomes in the profit and loss account, strictly related to the cost of the production factors (exhausting their utilities during the ordinary cycle) to which the contribution is related and intended to compensate.

ii) Contributions of a non-monetary nature/"in-kind" stated in the financial statements evaluating the asset or the cost deriving from the asset depreciation procedure and related contributions, setting up the relevant grant as deferred income, on the basis of the nominal value (a value which refers to a historical cost or actual cost related to the employed productive resources).

Assets

Non-current assets

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
0	8.418,21	8.418,21

Tangible assets

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
0	7.299,46	7.299,46

The following flow chart shows the individual items, summarized in the present Note.

Description	Property	Technical furniture	Electronic office machines	Mobile phone	Total
Balance as at 31/12/2014	0	0	0	0	0
Acquisitions during the year	0	0	6.772,18	1.338,33	8.110,51
Depreciation for the year	0	0	677,21	133,84	811,05
Balance as at 31/12/2015	0	0	6.094,97	1.204,49	7.299,46

Intangible assets

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
0	1.118,75	1.118,75

Its historical cost as at 31/12/2015 is as follows:

Description of costs	Balance as at 31/12/2014	Operating increments	Operating decreases	Depreciation for the year	Value to the 31/12/2015
Other deferred charges	0	1.398,42	0	279,67	1.118,75

Current assets

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
49.753,51	352.119,22	302.365,71

Short-term credits

The balance is divided according to the deadlines detailed as follows:

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
0	13.335,96	13.335,96

The composition of the amount as at 31/12/2015 is as follows:

Description	Within 12 months	Total
	301,54	301,54
Advances to suppliers	12.480,00	12.480,00
Receivables INPS	333,42	333,42
Credit notes to be received	221,00	221,00
Total	13.335,96	13.335,96

Cash and cash equivalents

The balance represents cash at the bank and in hand and thus the existing cash at the end of the financial year.

The balance represents the liquid assets and the existing cash at the end of the year.

Cash deposited at the bank UNICREDIT BANCA Spa.

Description	Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
Bank deposits	49.753,51	338.631,92	288.878,41

In this context, the Consortium is in a credit position towards Institute Unicredit, Agency of Trieste, where it has opened a current account for financial management. A sum of € 609.500,00 was paid into this account by the Ministry of Education, University and Scientific Research, through its Representing Entity R.E. Elettra – Sincrotrone Trieste in April 2015, as a financial contribution to support the Consortium' starting activities for the year reviewed.

Prepayments and accrued income

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
0	151,34	151,34

In general the items measure income and expenses whose competence is advanced or delayed 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 over time.

This amount represents prepaid expenses related to costs for annual software licenses.

Equity and liabilities

Equity

Capital and other permanent contributions from Members

Reserves

Accumulated surplus

No values are entered for these items. No equity and no changes.

Non-current liabilities

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
0	6.958,83	6.958,83

Detailed as follows.

Pension fund and other benefits for employment compensation

Severance indemnities for employees.

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
0	6.958,83	6.958,83

The item is made up as follows:

Description	Initial value 31/12/2014	Plan balance 2015	Substitutive tax	Paid to investments units	Severances paid during the year	End value 31/12/2015
Severance indemnities employees	0	6.958,83	0	0	0	6.958,83

The severance shelved figure represents the actual debt of the Consortium as at 31/12/2015 to employees in force at that date.

As at 31/12/2015 advances have not been required by employees.

Current liabilities

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
49.753,51	353.578,60	303.835,09

Detailed as follows.

Other short-term debts and liabilities

Debts

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
1.377,20	121.337,11	119.959,91

Description	31/12/2014	31/12/2015	Difference
Advances received	0	15.000,00	15.000,00
Account payable	0	46.893.38	46.893.38
Tax liabilities	0	12.044,88	12.044,88
Payables to social security institutions	0	15.211,45	15.211,45
Other payables	1.377,20	32.187,40	30.810,20
TOTAL	1.377,20	121.337,11	119.959,91

Debts are valued at their nominal value.

"Advances" includes an advance payment received for participation to a project financed by Regione Friuli Venezia Giulia.

"Account payables" includes liabilities for purchases of goods and services, compensation to collaborators.

The item "Tax payables" includes liabilities for taxes and is composed of deductions in respect of employees and associates of \in 5.147,31 and of taxes related to personnel costs (employees and collaborators) borne by the Consortium of \notin 6.897,57.

"Payables due to social security institutions" include the amount of social security contributions relating to employees and to collaborators, accrued but not paid as at 31 December 2015 to an amount of € 15.211,45.

"Other payables" include remaining debts, which by nature cannot described above, including amounts due to CERIC staff for all liabilities accrued to them, in accordance with current legislation and to Personnel Regulations, including the value of accrued vacation pay at the reporting date in accordance with the provisions of accounting Standard 19. This account as at 31/12/2015 is as follows:

Description	Amount
Payables to employees for holidays and leave not taken	3.806,70
Payables to members of the Scientific Committee	4.428,59
Payables to the control bodies	16.116,33
Other debts of a different nature	7.835,78
Total	32.187,40

The debts are evaluated at their nominal value. Debts to providers included in Account payables are stated net of possible trade discounts.

Deferred income and accrued expenses

These items are related to incomes and costs referring to the period calculated on an accrual basis. For accounting the financial contribution provided by the Italian Member, an indirect method has been chosen and the stated amount in this item is representative of the portion attributable to future financial years in the form of deferred income.

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
48.376,31	232.017,86	183.641,55

The item breaks down as follows.

Description	Amount	
Deferred income	232.017,86	
Accrued expenses	223,63	

The balance sheet item "Deferred income" measures the portion of the contribution funded by the Italian Ministry for University and Scientific Research through the RE Elettra-Sincrotrone Trieste S.C.p.A. for the financial year 2015 carried over to the benefit of future financial years.

Accrued expenses mainly concern the payment of utilities to be referred to next year.

Income statement, profit and loss account

Revenues

Revenue items identify the portion of the contribution for the financial year allocated by the Italian Member through its RE Elettra-Sincrotrone Trieste S.C.p.A. for the Consortium's starting activities to cover the start-up expenses.

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
1.643,86	425.858,45	424.214,59

Contributions for operating expenses

The amount is equal to \notin 425.858,45 originating from disbursement of the contribution by the Ministry of Education, University and Scientific Research (totalling EUR 609.500,00) and is relative to the share of such contribution, calculated on an accrual basis, to compensate all the expenses and costs in general, incurred related to the specific activities of the Consortium, generating costs incurred to an amount of \notin 425.858.45.

Interest on current account and rounding

The item represents the remuneration of activities carried out by the Consortium for deposits at banks accrued interest income on cash, current account n°000103334723 opened at Unicredit Banca.

Category	31/12/2014	31/12/2015	Difference
Interest on current account	20,17	276,94	256,77
Rebates and rounding	0	24,68	24,68
TOTAL	20,17	301,62	281,45

Costs

Operating costs

Balance as at 31/12/2014	Balance as at 31/12/2015	Difference
1.643,86	411.074,40	409.430,54

Detailed as follows.

Costs for raw materials, supplies, consumables and goods

Relate to costs incurred for the supply of consumables. The increase in the year is a direct result of the increased activities of the Consortium.

Category	31/12/2014	31/12/2015	Difference
Costs for raw materials, supplies, consumables and goods	112,85	5.957,86	5.845,01

Service costs

It has been decided to divide the item services, to facilitate fair presentation of the budget determined by the operating characteristics of the Consortium.

Description	31/12/2014	31/12/2015	Difference	
Mobile phones	0,00	7.171,63	7.171,63	
Annual software licenses	0,00	151,36	151,36	
Expenses workshop and seminars	0,00	467,19	467,19	
Canteen expenses	0,00	2.780,30	2.780,30	
Entertainment expenses	0,00	1.670,10	1.670,10	
Meeting various corporate bodies expenses	0,00	15.024,32	15.024,32	
Travel costs for employees, collaborators and social organs	0,00	26.061,77	26.061,77	
Fiscal and administrative consultancy	1.352,00	62.028,57	60.676,57	
Administrative collaborators	0,00	64.375,00	64.375,00	
Consulting and salaries processing	0,00	15.979,91	15.979,91	
Social security contributions of professionals	0,00	587,73	587,73	
Social security contributions of collaborators	0,00	12.549,34	12.549,34	
Contributions accident collaborators	0,00	306,52	306,52	
ISTAC remuneration	0,00	11.571,49	11.571,49	
Bank charges	179,01	710,03	531,02	
Postage	0,00	82,80	82,80	
Transport costs	0,00	171,00	171,00	
TOTAL	1.531,01	221.689,06	220.158,05	

Personnel costs

Personnel costs: breakdown

Employees	31/12/2014	31/12/2015	Difference
Wage and salaries	0	95.475,61	95.475,61
Social security charges	0	24.631,44	24.631,44
Severance indemnities	0	6.958,83	6.958,83
Allowances to be paid	0	3.806,70	3.806,70
Director and auditors	0	43.015,17	43.015,17
TOTAL	0	173.887,75	173.887,75

Composition and classification of the staff at 31.12.2015

Personnel at 31/12/2015	Personnel at 31/12/2014	Difference
7	0	7

Classification of personnel at 31.12.2015							
Units	Starting date contract	Functions					
1	July 2015	Manager					
1	July 2015 Administration						
1	September 2015	Research/Technology					
1	September 2015	Research/Technology					
1	September 2015	Research/Technology					
1	September 2015	Administration					
1	October 2015	Communication					

Use of third party materials or property

Category	31/12/2014	31/12/2015	Difference	
Guest house	0	9.540,03	9.540,03	
TOTAL	TOTAL 0		9.540,03	

Depreciation of tangible and intangible assets

In relation to depreciation, it is specified that this is calculated on the basis of the useful residual life of the asset and its use in production.

Description	31/12/2014	31/12/2015
Concessions and licenses	20%	279,67
Total amortization of intangible assets		279,67
Machine electronic office	20%	677,21
Telephony and mobile telephony	20%	133,84
Total amortization of fixed assets		811,05
TOTAL		1.090,72

Other operating costs

Other operating costs: breakdown

Other operating costs	31/12/2014	31/12/2015	Difference
Membership fees	0	5.000,00	5.000,00
Rounding	0	27,65	27,65
Other taxes	0	345,42	345,42
Other expenditures	0	1.724,01	1.724,01
TOTAL	0	7.097,08	7.097,08

Taxation

Current tax	31/12/2014	31/12/2015	Difference
IRAP	0	6.897,57	6.897,57
TOTAL	0	6.897,57	6.897,57

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.

Financial costs and revenues

In the financial management, accrued interest income on the bank account of the Consortium is stated as of 31.12.2015.

Trieste, 9 June 2016

Dr. Jana Kolar Executive Director

CERIC-ERIC

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SUPPLEMENTARY INFORMATION UNAUDITED

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

Regarding the in-kind contributions, which statutorily constitute a particularly significant element in terms of 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 2015 according to the principles of consistency and auditability on the basis of the "Methodology for Defining the Values involved in the Ceric-Eric Activities, and to Detail the In-kind Contributions" developed in late 2015.

However, it needs to be noted that, even before the establishment of the Consortium, some of the concerned PFs manifested themselves through this particular mode of contribution, which then allowed an immediate and consistent start of activities.

Their values were quantified by various PFs, albeit with the limitations set forth above, and are shown in the tables below in order to provide supplementary information that enables better understanding of the relevance of the total resources used by CERIC in the whole financial year of 2015.

IN-KIND CONTRIBUTIONS - ACCOUNTING DATA FOR 2015

Tab. 1a)

THE TOTAL COSTS OF THE OVERALL ORDINARY SCIENTIFIC/TECHNICAL ACTIVITIES OF THE PARTNER FACILITIES (PFs) IN 2015										
		RECURRENT COSTS								
NAME OF PF	PERSONNEL COSTS	TRAVEL AND ACCOMODATION	CONSUMABLES	SERVICES	UTILITIES	OVERHEADS	TECHNICAL DEVALUATION AND MAINTENANCE, LEASE/RENT COSTS OF INSTRUMENTS/ EQUIPMENT AND SPACES	TOTAL		
PF of Austria	389.457,25	15.636,70	64.596,79	308.156,50	-	9.167,00	5.318.729,60	6.105.743,84		
PF of Croatia	183.288,00	-	58.557,07	5.076,33	75.153,34	-	52.235,93	374.310,67		
PF of Czech Republic	140.482,00	16.144,00	409.000,00	-	-	81.500,00	1.127.406,00	1.774.532,00		
PF of Hungary	1.031.112,53	2.252,32	15.421,55	53.512,88	152.851,45	2.707.908,44	-	3.963.059,17		
PF of Italy	7.936.248,07	102.725,30	9.9	905.129,30		-	3.398.740,32	21.342.842,99		
PF of Romania	458.843,00	18.353,72	27.150,28	543,01	-	59.496,64	304.559,67	868.946,32		
PF of Slovenia	241.276,00	5.003,29	1.658,28	23.139,46	19.633,78	86.168,32	1.111.110,00	1.487.989,13		
TOTAL COSTS	10.380.706,85	160.115,33	11.	119.580,02		2.944.240,40	11.312.781,52	35.917.424,12		

Tab. 1b)

TOTAL COSTS OF THE ORDINARY SCIENTIFIC/TECHNICAL ACTIVITIES OF THE PARTNER FACILITIES (PFs) IN 2015 COMMITTED IN KIND										
		RECURRENT COSTS								
NAME OF PF	PERSONNEL COSTS	TRAVEL AND ACCOMODATION	CONSUMABLES	SERVICES	UTILITIES	OVERHEADS	TECHNICAL DEVALUATION AND MAINTENANCE, LEASE/RENT COSTS OF INSTRUMENTS/ EQUIPMENT AND SPACES	TOTAL		
PF of Austria	43.006,78	1.983,67	6.459,68	30.815,65	-	916,70	531.572,96*	614.755,44		
PF of Croatia	32.390,40	-	3.580,42	310,39	4,595.18	-	3.191,62	44.068,01		
PF of Czech Republic	140.482,00	16.144,00	73.053,00	15.500,00	-	45.936,00	208.786,00	499.901,00		
PF of Hungary	141.995,88	2.252,32	-	-	-	-	-	144.248,20		
PF of Italy	1.096.568,00	62.490,00	208.930,00	1.398.695,00	745.977,00	770.879,00	979.565,00	5.263.104,00		
PF of Romania	19.201,62	3.416,66	5.430,06	108,60	-	11.899,33	61.495,23	101.551,50		
PF of Slovenia	48.255,20	5.003,29	1.658,28	23.139,46	5.186,32	18.661,35	83.789,60	185.693,50		
TOTAL COSTS	1,521,899.88	91.289,94	299.111,44	1.468.569,10	755.758,50	848.292,38	1.868.400,41	6.853.321,65		

IN-KIND CONTRIBUTIONS - BUDGET DATA FOR 2016

Tab. 1c)

PLANNED COSTS FOR THE OVERALL ORDINARY SCIENTIFIC/TECHNICAL ACTIVITIES OF THE PARTNER FACILITIES (PFs) IN 2016										
	RECURRENT COSTS									
NAME OF PF	PERSONNEL COSTS	TRAVEL AND ACCOMODATION	CONSUMABLES	SERVICES	UTILITIES	OVERHEADS	TECHNICAL DEVALUATION AND MAINTENANCE, LEASE/RENT COSTS OF INSTRUMENTS/ EQUIPMENT AND SPACES	TOTAL		
PF of Austria	389.457,25	15.636,70	70.000,00	100.000,00	-	10.000,00	5.318.729,60	5.903.823,55		
PF of Croatia	183.288,00	-	58.557,07	5.076,33	75.153,34	-	52.235,93	374.310,67		
PF of Czech Republic	140.482,00	16.144,00	660.000,00	-	-	1.149.000,00	1.239.906,00	3.205.532,00		
PF of Hungary	1.037.888,50	1.582,38	15.421,55	53.512,88	152.851,45	2.707.908,44		3.969.165,20		
PF of Italy								-		
PF of Romania	481.800,00	24.090,00	28.508,00	570,00	-	62.471,00	336.054,00	933.493,00		
PF of Slovenia	241.276,00	5.003,29	2.000,00	25.000,00	21.000,00	92.000,00	841.500,00	1.227.779,29		
TOTAL COSTS	2.474.191,75	62.456,37	834.486,62	184.159,21	249.004,79	4.021.379,44	7.788.425,53	15.614.103,71		

Tab. 1d)

PLANNED COSTS FOR THE OVERALL ORDINARY SCIENTIFIC/TECHNICAL ACTIVITIES OF THE PARTNER FACILITIES IN 2016 CONTRIBUTION IN-KIND								
				RECURREN				
NAME OF PF	PERSONNEL COSTS	TRAVEL AND ACCOMODATION	CONSUMABLES	SERVICES	UTILITIES	OVERHEADS	TECHNICAL DEVALUATION AND MAINTENANCE, LEASE/RENT COSTS OF INSTRUMENTS/ EQUIPMENT AND SPACES	TOTAL
PF of Austria	42.945,73	1.963,67	7.000,00	10.000,00	-	1.000,00	531.572,96*	594.482,36
PF of Croatia	32.390,40	-	3.580,42	310,39	4.595,18	-	3.191,61	44.068,00
PF of Czech Republic	140.482,00	16.144,00	237.600,00	15.500,00	-	70.933,00	348.786,00	829.445,00
PF of Hungary	143.040,58	1.582,38						144.622,96
PF of Italy								-
PF of Romania	20.160,62	5.109,00	5.702,00	114,00	-	12.494,00	67.916,64	111.496,26
PF of Slovenia	48.255,20	5.003,29	1.950,00	25.000,00	5.300,00	20.000,00	125.662,00	231.170,49
TOTAL COSTS	427.274,53	29.802,34	255.832,42	50.924,39	9.895,18	104.427,00	1.077.129,21	1.955.285,07

Central European Research Infrastructure Consortium

Tab. 2

TOTAL PRESENT VALUE OF EQUIPMENT AND SPACES AVAILABLE TO PFs in 2015		
PARTNER FACILITY	PRESENT VALUE (estimated)	
Partner Facility of Austria	-	
Partner Facility of Croatia	63.362,66	
Partner Facility of Czech Republic	4.350.000,00	
Partner Facility of Hungary	3.222.201,54	
Partner Facility of Italy	950.033,64	
Partner Facility of Romania	1.452.856,00	
Partner Facility of Slovenia	1.300.388,77	
TOTAL VALUE OF FIXED ASSESTS IN THE PFs	11.293.842,61	

Tab. 3

TOTAL FREE ACCESS TO EXTERNAL USERS SELECTED THROUGH CERIC PEER REVIEW IN 2015			
Partner Facility of Austria	SAXS	10%	
	DXRL	10%	
	SAXS Lab	10%	
	LS	10%	
Partner Facility of Croatia			
Partner Facility of Czech Republic	NAPXPS	10%	
	FESEM	20%	
	MSB	50%	
	XPS/XPD	20%	
	NAA	15%	
	RAD	15%	
Partner Facility of Hungary	PGAA	15%	
nongury	NIPS-NORMA	15%	
	IBMS	15%	
Partner Facility of Italy			
Partner Facility of Romania	CW X-band ESR spectrometer model EMX- plus from Bruker (upgrade Varian E12)	20%	
	CW Q-band ESR spectrometer model ELEXSYS E 500Q from Bruker with E560 ENDOR accessory	20%	
	Pulse/CW X - band ESR spectrometer model ELEXSYS E 580 from Bruker with E560 DICE II pulse ENDOR and E580-400 pulse ELDOR accessories	20%	
	Compact Microwave EPR Spectrometer CMS 8400	20%	
	UV-VIS double beam spectrophotometer, model Specord 250 Plus, Analytik Jena	20%	
	Automatic liquid He plant model Crymotech LHeP 18	20%	
	JEOL JEM ARM 200F	20%	
	JEOL 200CX Analytical TEMSCAN	20%	
	TESCAN LYRA 3 XMU SEM-FIB	20%	
	JEM 2100		
	Software Mactempasx version 2	20%	
	Lic. Software Crystalkitx version 1.9	20%	
Partner Facility of Slovenia	800 MHz (David)	13%	
	600 MHz (Lara)	0%	
	600 MHz (Magic)	13%	

PLANNED CONTRIBUTION OF INSTRUMENT ACCES IN 2016			
Partner Facility of Austria	SAXS	10%	
	DXRL	10%	
	SAXS Lab	10%	
	LS	10%	
Partner Facility of Croatia			
Partner Facility of Czech Republic	NAPXPS	10%	
	FESEM	20%	
	MSB	50%	
	XPS/XPD	20%	
	NAA	15%	
Partner Facility of Hungary	RAD	15%	
	PGAA	15%	
	NIPS-NORMA	15%	
	IBMS	15%	
Partner Facility of Italy			
Partner Facility of Romania	CW X-band ESR spectrometer model EMX- plus from Bruker (upgrade Varian E12)	20%	
	CW Q-band ESR spectrometer model ELEXSYS E 500Q from Bruker with E560 ENDOR accessory	20%	
	Pulse/CW X - band ESR spectrometer model ELEXSYS E 580 from Bruker with E560 DICE II pulse ENDOR and E580-400 pulse ELDOR accessories	20%	
	Compact Microwave EPR Spectrometer CMS 8400	20%	
	UV-VIS double beam spectrophotometer, model Specord 250 Plus, Analytik Jena	20%	
	Automatic liquid He plant model Crymotech LHeP 18	20%	
	JEOL JEM ARM 200F	20%	
	JEOL 200CX Analytical TEMSCAN	20%	
	TESCAN LYRA 3 XMU SEM-FIB	20%	
	JEM 2100		
	Software Mactempasx version 2	20%	
	Lic. Software Crystalkitx version 1.9	20%	
Partner Facility of Slovenia	800 MHz (David)	20%	
	600 MHz (Lara)	20%	
	600 MHz (Magic)	20%	

Trieste, 9 June 2016

Dr. Jana Kolar Executive Director CERIC-ERIC

Abbreviations

BoD: Board of Directors

CERIC: Central European Research Infrastructure Consortium

ERA: European Research Area

ERIC: European Research Infrastructure Consortium, a legal framework created by the European Commission to allow the operation of Research Infrastructures of Pan-European interest.

GA: General Assembly

IL&TT: Industrial Liaison and Technology Transfer

IR: Internal Regulations

ISTAC: International Scientific and Technical Evaluation Committee

PF: Partner Facility

RE: Representing Entity

RI: Research Infrastructure

R&D: Research & Development

S&T: Science & Technology

CERIC-ERIC



Ion beams at the

Institute in Zagreb

http://www.irb.hr

Ruđer Bošković

Synchrotron and laser light at Elettra in Trieste http://www.elettra.eu

Synchrotron light at Solaris in Krakow http://www.synchrotron.uj.edu.pl



Surface analysis at the Charles University Prague and Elettra http://physics.mff.cuni.cz Electron microscopy and EPR at the National Institute of Material Physics in Magurele http://lab50.infim.ro



Neutrons at the Budapest Neutron Centre http://www.bnc.hu



NMR at the National Institute of Chemistry in Ljubljana http://www.nmr.ki.si



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