



**CERIC-ERIC** is an integrated multidisciplinary Research Infrastructure open for basic and applied users in the fields of Materials, Biomaterials and Nanotechnology. With a single entry point to excellent facilities, it allows structural investigation, analysis and synthesis of materials, using photon, electron, neutron, and ion based techniques.



Results



Opportunities



Events



Highlights



## CERIC-ERIC newsletter

### n.6

July 2016

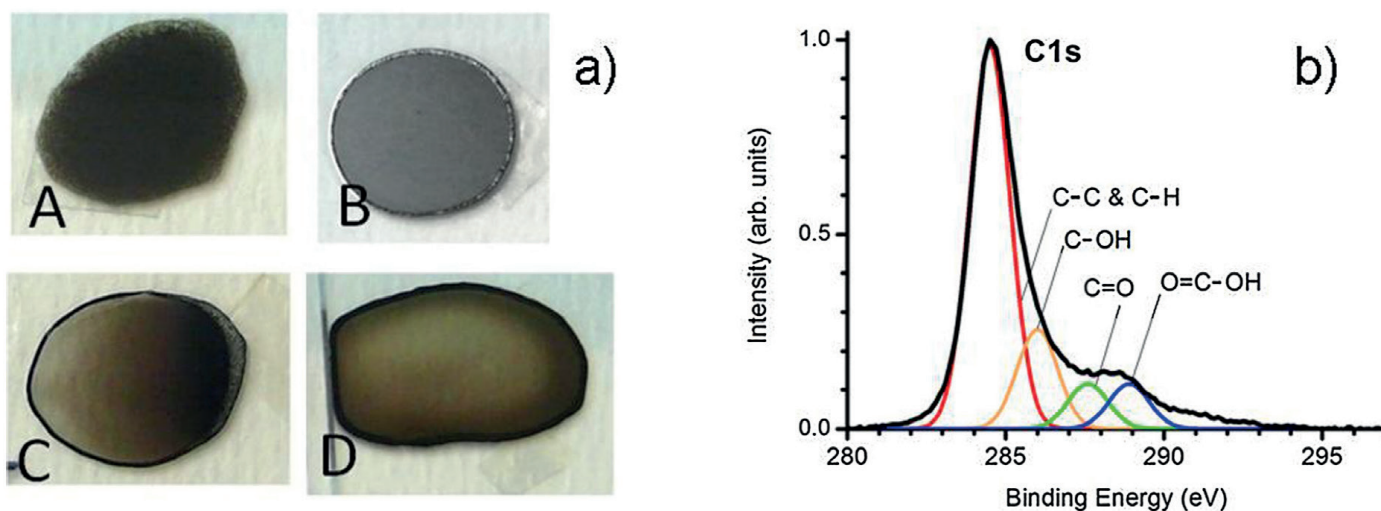
# Results

## Scientists change the morphology of graphene-like thin films for cheaper and environmentally friendly electronic devices\*

Modern day electronics has a high demand for organic opto-electronical materials for liquid-crystal displays, organic-LED and even organic photovoltaic elements. Such materials have to be transparent and conductive, as well as flexible, cheap and compatible with large scale manufacturing methods. Carbon based organic conductors, such as carbon-nanotubes and graphene thin-layers, are promising candidates for future organic opto-electronic devices. Nevertheless, the production of carbon-based films having simultaneously high stability, controlled thickness and tunable properties is still a challenge.

Italian researchers around **Michela Alfè** and **Valentina Gargiulo** from the IRC-CNR and the University of Naples have developed a new manufacturing process for graphene-like (GL) thin layers. Their process is performed in water and is therefore cheap, environmentally friendly and easy to scale for industrial production needs. In order to develop and improve the process further, a

fundamental understanding of all aspects of the film preparation is crucial. In particular, the quality of the thin film is expected to be strongly dependent on the pH of the water suspension from which the films themselves are prepared. To gain this understanding, the researchers used CERIC's highly sensitive Synchrotron X-ray Photoelectron Spectroscopy (XPS) in combination with Atomic Force Microscopy (AFM) and Dynamic Light Scattering (DLS), to investigate the influence of pH on the synthesis process. They found that the thin-layers consists of a film of carbon nanoparticles. The shape of these nanoparticles, as well as the thickness and morphology of the film, strongly depend on how acidic the reaction solution is. This information is a first but important step in understanding the physical mechanisms of the process and opens the way to the possibility of controlling the surface morphology of GL layers by properly acting on the preparation parameters.



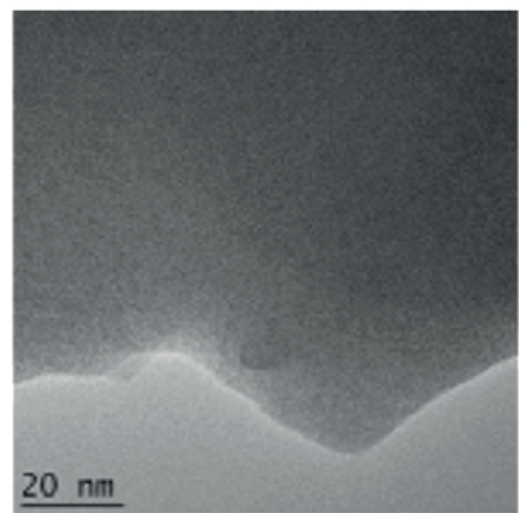
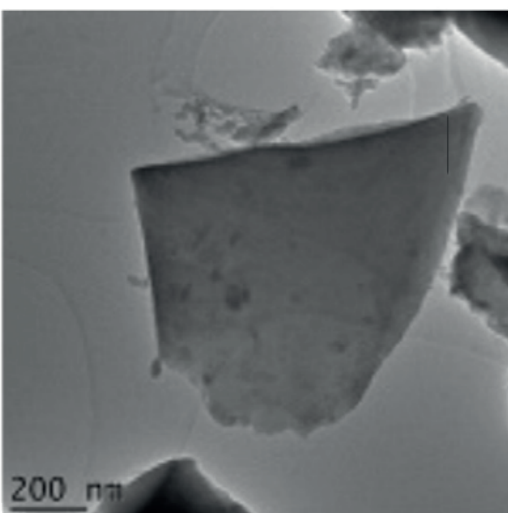
(a) Images of the drop casted films corresponding to measured Samples A (pH 2.0), B (pH 3.7), C (pH 4.6), D (pH 9.5); (b) C 1s XPS spectrum on GL surface, and its deconvolution in Gaussian shape peaks corresponding to different functional groups.

## A clearer understanding of the role of zinc in glass structure brings the optimization of electronic displays a step forward\*

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 of 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.

**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 not only produced precise structural data but also revealed that zinc plays an active role in forming the structure and is also fully incorporated. This new information is an important step towards a deeper understanding of this interesting class of materials and helps further to optimize the glasses for potential application.



TEM images of 30MoO<sub>3</sub>-50ZnO-20B<sub>2</sub>O<sub>3</sub> glassy sample

\*M. Fabian, E. Svab, K. Krezhovc, Network structure with mixed bond-angle linkages in MoO<sub>3</sub>-ZnO-B<sub>2</sub>O<sub>3</sub> 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>

## News from the CERIC General Assembly

Trieste - Italy, 23 June 2016

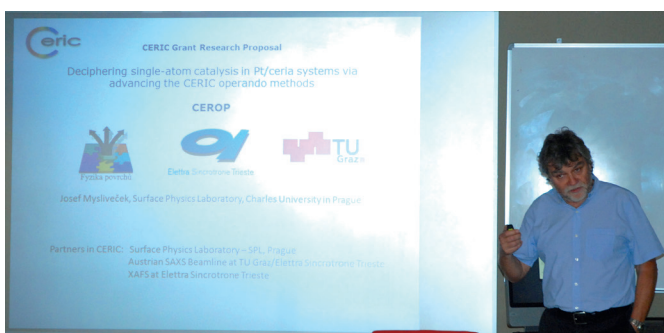
The General Assembly of CERIC-ERIC took place on the 23rd of June at the Italian Representing Entity in Trieste. The main news and adopted resolutions are as follows:

- The 2015 Report, including the 2015 Annual Accounts and the 2016 Budget, was approved. [Click here for download.](#)
- The methodology for defining the values involved in the Ceric activities and for detailing in-kind contributions was approved.
- The selection of projects submitted to the CERIC Research Grants, as proposed by ISTAC, following the international peer review, was approved.
- A framework agreement between CERIC and Uzhorod National University (Ukraine) has been signed, with the goal of enhancing collaboration between the two entities in the future, for joint development of scientific, technological and training activities.
- The participation of CERIC-ERIC as founding member in the Incorporation Deed of RESAVER IORP was approved.

*RESAVER is a single pan-European pension arrangement offering a defined contribution plan, tailor-made for research organisations and their employees, allowing them to move across countries while keeping the same supplementary pension fund.*



(From left) Prof. Volodymyr Smolenka, Rector of the Uzhorod National University, Jana Kolar, Executive Director of CERIC, Carlo Rizzuto, Chair of the CERIC General Assembly (GA), and Ileana Gimmillaro, Secretary of the GA



Vladimir Matolin, Director of the Czech Partner Facility, presents CEROP to the General Assembly. The project has been submitted by Josef Mysliveček, Principal Investigator and winner of the CERIC Research Grant



(From left) Ornella De Giacomo, Deputy Executive Director of CERIC, Jana Kolar, Executive Director of CERIC, Carlo Rizzuto, Chair of the CERIC General Assembly (GA), and Ileana Gimmillaro, Secretary of the GA



Kevin Prince, Principal Investigator of Dyna Chiro and winner of the CERIC Research Grant, presents the project to the General Assembly



Maya Kiskinova, Principal Investigator of RENEWALS and winner of the CERIC Research Grant, presents the project to the General Assembly

July 2016

## Selected projects receiving CERIC Research Grants

*Renewals, CEROP, Dyna Chiro will be granted, of 450.000 EUR each*

23 June 2016

During the CERIC General Assembly, which took place on 23rd June, the ranking list of the winners of the CERIC Research Grants was unanimously approved.

The winning proposals are:

### **Renewals - Graphene for water in Life Sciences**

Principal Investigator: Maya Kiskinova

Involved CERIC Partner Facilities: Elettra (IT), MSB-SPL (CZ), NIMP (RO), TUG (A)

Other facilities involved: NanoInnovation Lab and Structural Biology Lab at Elettra

### **CEROP – Deciphering single-atom catalysis in Pt/ceria systems via advancing the CERIC operando methods**

Principal Investigator: Josef Mysliveček

Involved CERIC Partner Facilities: MSB-SPL (CZ), Elettra (IT), TUG (A)

### **Dyna Kyro – Spectroscopy and Dynamics of Chiral Systems**

Principal Investigator: Kevin Prince

Involved CERIC Partner Facilities: Elettra (IT), SOLARIS (PL)

Other facilities involved: University of Nova Gorica, University of Silesia

The evaluation committee emphasized the high quality of submissions to the CERIC Research Grants call and evaluated a number of projects as suitable for funding. However, the resources available limited the number of grants allocated to the top three from the ranking list.

The International Scientific and Technical Advisory Committee - ISTAC has encouraged CERIC to investigate the possibilities of allocating more funds in order to support additional proposals submitted to the CERIC Grants call.



# Opportunities

## The CERIC Call for proposals is open

The [CERIC call for proposals](#) for access to integrated multidisciplinary facilities for Materials and Biomaterials is now open.

Applicants can request access to more than 40 different and complementary state of the art techniques, distributed in 8 countries, with the submission of single and multi-technique proposals through a single entry point.

### What's new in this call

CERIC will select the most successful proposals and **cover the full cost for open access publications, as well as a conference fee (1000 € max.)** to present the obtained results.

The award will be based on the results of the research performed through the facilities offered by CERIC.

The submission of an application will be possible at any time and will be evaluated by an expert committee set up by CERIC.

Read more about this opportunity and check the eligibility, selection and evaluation criteria [here](#).

**SISSI** and **IUVS** beamlines will offer time for measurements with conventional sources.

**SOLARIS** is considering offering time for “expert commissioning” of its beamlines. For further information, please [contact SOLARIS directly](#).

Furthermore, CERIC is starting a **pilot on open access to research data**. You may be asked during your experiment whether or not you accept providing open access to your data.

*Access to CERIC is open to scientists from all over the world and free of charge. The only condition for free access is the publication of the results of the experiments, with appropriate citation of the facilities and local contacts involved. Proposals should be submitted online through the Virtual Unified Office (VUO). The best projects will be selected by peer review by an independent and international panel of experts.*

### Two steps deadline

Also in this call, CERIC will offer a two-step deadline option. The first deadline allows a pre-evaluation of the proposal at the facilities and, if necessary, two weeks for editing on the basis of the suggestions received, before final submission at the second deadline. Although we suggest taking advantage of the pre-evaluation, expert users may decide to submit their proposals directly at the second deadline.



### Deadlines

**Step 1: 1st September - 5pm CET**

**Step 2: 29th September - 5pm CET**

### Single instrument proposals

Single instrument proposals are admitted for the following techniques:

- Deep Lithography beamline in Trieste
- Light and x-ray scattering lab in Graz
- NAP XPS, XPS/XPD and FESEM in Prague
- SISSI and IUVS beamlines, only for use with conventional sources (not SR)
- NMR spectrometers in Ljubljana
- TEM and EPR in Bucharest
- Ion beam beamlines in Zagreb

## WHERE TO FIND US. July-October 2016:

Do you have questions or would you like to meet us? Below are upcoming events at which you can find us:

- 23-27 July: Euro Science Open Forum - ESOF 2016, Manchester Central, MANCHESTER - UK
- 19-22 September: 2016 E-MRS Fall Meeting and Exhibit, Warsaw University of Technology, WARSAW - POLAND
- 26-28 October: REinEU2016 - Re-Industrialisation of the EU 2016, Incheba, BRATISLAVA - SLOVAKIA

# Events

## PaGES partners met at the project's final meeting and agreed on the submission of PaGES2

Trieste - Italy, 20 May 2016

On the 20th of May, all partners of the PaGES project took part in the final meeting to exchange best practices, hints and suggestions for the development and re-submission of an improved proposal to be implemented in the academic year 2016-2017.

The professors of all the schools involved (Liceo Scientifico Duca degli Abruzzi – Gorizia, Liceo Scientifico A. Einstein – Cervignano del Friuli, Liceo Scientifico G. Galilei – Trieste) expressed their satisfaction at the results achieved through the activities carried out during PaGES and showed great interest and will to include the project in the yearly training offer of their schools. PaGES fits very well with other extraordinary academic projects of the school partners involving the students in experimental and science communication activities, and enhances them thanks to a number of added values: it gives the students the chance to have direct experience of an international scientific

environment, in which they can literally make science, and it offers a wider perspective of the variety of professional paths that can be taken in a research infrastructure. Through PaGES, the participants have observed and experienced the different aspects of research, from hard science to its dissemination, from project management to administration, data analysis and technology transfer, and they have consequently gained a clearer idea of what their spectrum of working possibilities can be.

During the final meeting, all partners reported positive evaluations and remarks from the students and reconfirmed the partnership for submitting PaGES2 within the upcoming deadline. [PaGES](#) is a project funded by the Italian region Friuli Venezia Giulia within the program “Regional plan for the building up of the formative offer for the academic year 2015/2016”, in the section “Special projects”.



Representatives of the partners of the project PaGES: CERIC-ERIC, Liceo Scientifico A. Einstein (Cervignano del Friuli - Italy), Liceo Scientifico Duca degli Abruzzi (Gorizia - Italy), Liceo Scientifico G. Galilei (Trieste - Italy), Kyma s.r.l.

## The first “International Workshop of Materials Physics” took place at NIMP to promote Romanian research

Magurele - Romania, 23–25 May 2016



Professor Elvira Fortunato



Professor Rodrigo Martins

For three days, between 23rd and 25th of May, the first International Workshop of Materials Physics took place at the National Institute of Materials Physics, the Romanian Representing Entity of CERIC. The event reunited distinguished members of the international and national scientific community, with the goal of facilitating the promotion of Romanian research at the international level and new collaboration between NIMP and prestigious research institutions from abroad.

The scientific event was inaugurated by a presentation by **Professor Rodrigo Martins**, president of the E-MRS Senate and member of the Advisory Group of the Horizon 2020 program Advanced Materials, Nanotechnologies and Biotechnologies, followed by a presentation by the director of the Institute of Nanomaterials, Nanofabrication and Nano-modelling and of CENIMAT, Vice-president of the High Level Expert Group, **Professor Elvira Fortunato**. The High Level Group of Scientific Advisors of the EC Scientific Advice Mechanism also jointly coordinated a round table concerning the future of research in the field of advanced materials and nanotechnology.

**Jana Kolar**, Executive Director of CERIC, also had a presentation about the Consortium, to show its

innovative business model, its services and the opportunities that this pan-European infrastructure offers to the scientific community. The themes discussed in the workshop, with 38 presentations from both external invited speakers and fellow researchers from NIMP, spanned Electronics, Ultra-thin and 2D, Energy, Functionalities, Large Infrastructures, Materials for Life Sciences, Catalysis, Carbon and Nano, all representing emergent fields, successful in terms of innovations with a significant impact for the future. The discussions that followed provided a starting point for new collaborations, aimed at innovative results in the field of new materials and their interfaces with life sciences and more. The event proved to be a good environment for exchanging ideas and launched constructive discussions in terms of consolidating excellence in research at NIMP and improving Romanian technology transfer (possible application for TEAMING and TWINNING).

In view of the success of the first “International Workshop of Materials Physics”, NIMP will continue to organize this event periodically, since it is an opportunity to consolidate traditional international partnerships and to reveal new solutions for durable and sustainable development.



July 2016

## Jana Kolar announces the winners of the EIT Awards 2016

Budapest - Hungary, 25-26 April 2016

In April 2016, in Budapest - Hungary, the most innovative entrepreneurs were rewarded with the EIT Awards 2016. Jana Kolar, Executive Director of CERIC and member of the Governing Board of the [European Institute of Innovation and Technology \(EIT\)](#), chaired the Venture award selection committee. At the final ceremony, she presented the winners and their achievements, while the prize was awarded jointly by Commissioners Navracsic and Moedas.

The aims of the EIT Awards are to promote innovation and encourage entrepreneurship by putting the most innovative ventures, entrepreneurial graduates and innovation teams emerging from the Knowledge and Innovation Communities (KICs) in the spotlight and to create role models to drive future change.

Within the EIT Community, the EIT Awards play an important role in celebrating achievements and success, identifying role models and increasing opportunities for the continued development of EIT Award winners.

To listen to interviews with the winners, **double-click on the images below:**



[CLICK HERE TO WATCH THE VIDEO](#)



[CLICK HERE TO WATCH THE VIDEO](#)



[CLICK HERE TO WATCH THE VIDEO](#)

July 2016



## CERIC @ the ISSRNS 2016

The services and opportunities offered by CERIC were presented to the Polish scientific community at the 13th International School and Symposium on Synchrotron Radiation Ustron - Poland, 13-18 June 2016

CERIC and its newest partner facility, the Polish synchrotron SOLARIS, were two highlights at this year's International School and Symposium on Synchrotron Radiation (ISSRNS'2016) in Ustron/Poland. **Matthias Girod** presented CERIC, its partners, services and possibilities to the students and synchrotron user community of Poland, CERIC's newest member. **Adriana Wawrzyniak**, Machine Deputy Director at the Polish PF, gave insights into the specification and operating status of the synchrotron. **Karolina Szamota-Leandersson** presented the UARPES beamline at Solaris, which will be available for CERIC users in the near future.

*The 13th International School and Symposium on Synchrotron Radiation in Natural Science (ISSRNS'2016) is a traditional forum for discussing fundamental issues of the application of synchrotron radiation and related methods in natural sciences. The goal of this interdisciplinary symposium is to bring together users (scientists and graduate students) of synchrotron radiation. The meeting focused on novel applications of synchrotron radiation in physics, chemistry, material and life sciences.*

*The ISSRNS'2016 was organized by the Polish Synchrotron Radiation Society - PSRS ([www.synchrotron.org.pl](http://www.synchrotron.org.pl)), in cooperation with Adam Mickiewicz University in Poznan, Poland.*

## HERCULES 2016 at the Italian Representing Entity of CERIC

Trieste - Italy, 11-15 April 2016

From April 11th to 15th, 2016, the Italian Representing Entity of CERIC-ERIC, Elettra Sincrotrone Trieste, welcomed a group of 16 PhD and post-doc students from the HERCULES school.

HERCULES is a world known 1-month school providing training for students, postdoctoral and senior scientists in the field of Neutron and Synchrotron Radiation for condensed matter studies. It includes lectures, practicals and tutorials as well as a week at a European facility. During their training visit, the students were able to benefit from high level scientific lectures about the scientific possibilities offered by CERIC-ERIC and about the Elettra and FERMI lightsources.

**Prof. Janez Plavec**, Director of the Slovenian Partner Facility in CERIC, presented the Slovenian NMR and gave some examples of the research that can be conducted with the techniques offered.

The programme was complemented by 2 full days of practicals on FERMI (control room and experimental hall), the Nano Innovation Laboratory and five Elettra beamlines (BACH, BadElph, Nanospectroscopy, SAXS, TWINMIC). The students' proactive interest confirms once more the excellence of the instruments available in CERIC and its facilities and of the technical personnel.



Professor Janez Plavec presents the Slovenian NMR - Slovenian Partner Facility of CERIC



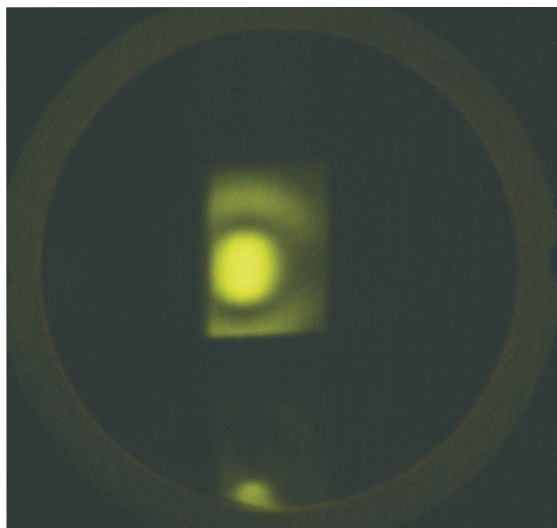
Cecilia Blasetti introduces CERIC-ERIC to the students

# Highlights

## Solaris has given light to the UARPES beamline and will soon construct the PHELIX beamline

Poland, May-June 2016

The **first light** from the variably polarizing undulator (APPLE II type - Angle-Resolved Photoelectron Spectroscopy) installed on the **UARPES beamline** at the National Synchrotron Radiation Centre Solaris in Krakow, has been observed. The Solaris team, supported by specialists from AGH University of Science and Technology, Jagiellonian University and the Prevac company, also took the **first photoemission spectra** at the UARPES beamline. These achievements constitute important steps towards performing preliminary tests on the beamline, and subsequently making it available for research studies starting from 2017.



The Italian Representing Entity, Elettra Sincrotrone Trieste, has been actively involved in the Solaris construction, providing scientific and technical consultancy during the most crucial initial stages as well as designing the PEEM/XAS beamline, which paved the way for winning the contract for designing, building and installing the UARPES beamline.

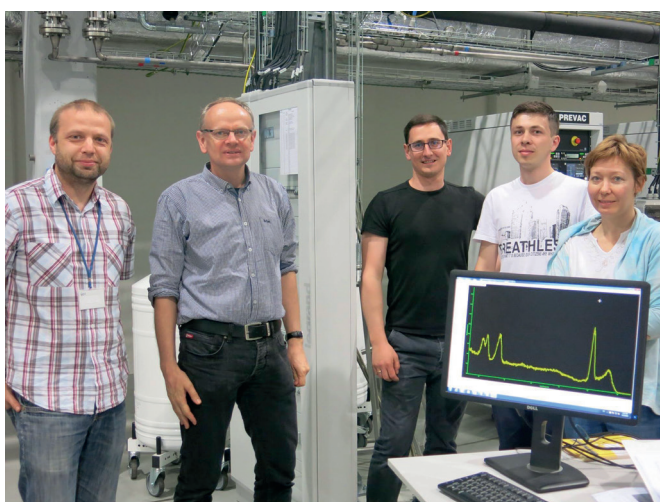
The "footprint" of the synchrotron "light" (ultraviolet of photon energy 140 eV) on a luminescent YAG screen. In the image can be seen: a central spot of about 5 mm in diameter and a ring of 6 mm radius. They were measured at an effective distance of 16 m from the source. They correspond perfectly to the theoretically predicted diffracted beams of the undulator fundamental harmonic radiation. The electron energy is 1.5 GeV and the undulator gap is 100mm. For these settings it is expected that the 0-order diffraction beam appears circularly symmetric and with a divergence of 0.12 mRad FWHM while the 1-order diffraction ring is observed 0.37 mRad away from the beam axis. (Photo: **Jacek Kołodziej**)

Solaris has also been awarded a grant from the Polish Ministry of Science and Higher Education for the construction of a new beamline, **PHELIX**, designed to perform studies of the electronic structure of solids with high energy resolution, using soft X-rays.

The source of the X-rays will be an elliptically polarizing undulator delivering radiation in the energy range 50–1500 eV. The beamline will be equipped with a grating monochromator with a resolving power  $E/\Delta E \sim 10^4$ .

The main technique will be photoelectron spectroscopy, including an angle resolved option. The layout of the beamline and end-station also allows use of light from the same source for another end-station.

The construction of the beamline will be coordinated by **Prof. Jacek Szade** from the University of Silesia (Katowice, Poland).



## Jana Kolar presents CERIC and its funding schemes at the Symposium on Funding Instruments for Developing Research Infrastructures

Madrid - Spain, 19 April 2016

The Symposium on European Funding Instruments for Developing Research Infrastructures was organized on the 19th of April in Madrid to provide a comprehensive view of the financial possibilities that European Research Infrastructures (RIs) can consider in order fully to exploit their research capacities and services.

At the event, organized within the RICH project and in cooperation with the European Commission's Research and Innovation Directorate-General, Jana Kolar presented CERIC rationale and funding schemes, in line with the goal of RICH to facilitate the information flow on different funding instruments available and their connection to the RIs ecosystem.

*RICH 2020, the European Network of National Contact Points (NCPs) for Research Infrastructures in Horizon 2020, facilitates transnational cooperation between NCPs, promotes the effective implementation of the RI programme, supports transnational and virtual access to RIs and highlights the opportunities offered by Research Infrastructures - at European and international levels.*

Jana Kolar at the RICH Symposium on Funding Instruments for developing Research Infrastructures



### Report:

Potentials for co-funding of CERIC activities with the cohesion policy funds

Jana Kolar  
1. September 2013



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

**RI & Joint RD activities:** regional ERDF, cross-border ERDF

**Open access:** all ERDF (limited to outreach, pilots, IL)

**Training:** all ERDF, ESF

**Coordination, outreach, communication, TT:**

Mainly transnational ERDF

### Examples:

#### Regional ERDF, national

- **CERIC (Int): joint RD (IT national, all with in-kind contributions)**

- **Surface physics (CZ):** support to users (national), RI

- **NMR (SI):** support to CERIC activities (national)

- **Solaris (PL):** constructed with ERDF, a call for RIs op

- **Microscopy (RO):** ca. 80% of RI cofunded with the E

**Transnational ERDF:** Central Europe (submitted)

**Cross-border ERDF:** SI-AT (RIS and RD; submitted), SI-



6:51 / 10:28

**CLICK HERE TO WATCH THE VIDEO**



Send your comments, articles and contributions to:  
[press@ceric-eric.eu](mailto:press@ceric-eric.eu)



Read more news and keep updated about CERIC-ERIC  
opportunities and events on our website

[www.ceric-eric.eu](http://www.ceric-eric.eu)