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EURONS: EUROpean Nuclear Structure Integrated Infrastructure Initiative

Nuclear structure research is fundamental, cutting-edge science aimed at increasing our understanding of the structure of atomic nuclei and their components. The EURONS Integrated Infrastructure Initiative (I3) will underpin European nuclear structure research through a combination of networking, joint research and facilitation of access – in particular transnational access – to major research infrastructures. With EU funding, EURONS is a major initiative which seeks to optimise European resources in this field and buttress this specialised research community, with a view to maintaining and enhancing Europe’s leading role in nuclear structures

● A QUANTUM LEAP FOR EUROPEAN NUCLEAR RESEARCH

EURONS builds on a rich tradition, in Europe, of interplay between theory and experiment, and the universities and large-scale facilities that carry out research. It aims to build on collaborative actions already initiated in earlier EU research programmes. Bringing together major research institutions from 21 countries, the project presents a coherent and complementary package of activities incorporating networking, transnational access and joint research projects.

Designed to significantly boost European integration in this field of research, with particular efforts to include scientists and research teams from the new Member States, EURONS should help Europe reach a level of coordination over and above the achievements of comparable research communities and sister facilities in the United States and Japan.

Europe benefits from a number of world-class research infrastructures, allowing unique research opportunities for nuclear structure studies, but especially for multidisciplinary research exploiting nuclear beams. For example, European physicists have access to the highest energy fragment and post-accelerated beams, the highest intensities for enriched isotope

beams, the smallest-emitting proton beams, and the largest-range and most short-lived ISOL beams. All the facilities within EURONS offer unique instrumentation of one kind or another, including storage-cooler rings (exclusive to Europe) and high-performance spectrometers for particle- and gamma-ray detection.

A major goal of the project is to improve access to these facilities – both the quality and quantity of access – with special attention to integrating researchers from Eastern Europe. This is being done through diverse measures, including user training programmes and harmonisation of access conditions and operational practice. It should also serve to help identify ‘best practices’ and future needs.

The eight facilities brought together within EURONS, which include the two supranational facilities, the European Centre for Theoretical Studies in Nuclear and Related Areas (ECT) and CERN’s On-Line Isotope Mass Separator (ISOLDE), have been identified by the community as leaders in the field with regard to accelerator specifications, available instrumentation and the level of user interest. (See full list below.)

● GETTING TOGETHER, GETTING THE RESULTS

Further improvements and extensions of these facilities are being achieved through the 11 Joint Research Activities of EURONS. Research and development priorities have been identified, based on scientific and technical promise, combined with short-term application possibilities. These activities are, in general, relevant to more than one facility and rely on strong participation, often in

leading positions, of European university groups.

EURONS’ networking actions have a more prospective character, with emphasis on fostering future co-operation and complementary work, and ensuring broad dissemination of results and the pooling of resources (including human capital). They also

include activities integrating Eastern European scientists from the new Member States and the candidate countries. In addition to seven specific networks, the managing network (MANET) coordinates all technical, scientific, financial, administrative, contractual and legal activities of EURONS.

The networks correspond to the priority areas identified by the community and can be grouped into the following areas: coordinating Europe-wide use of existing gamma-ray

instrumentation (GAMMAPOOL); increasing integration in the areas of heavy element physics (SHE) and nuclear astrophysics (CARINA); integrating the research potential of Eastern European scientists from the new EU Member States and the candidate countries (EWON); strengthening synergies between theory and practice (TNET); mapping the needs of the community (NuPECC); and increasing public awareness and understanding of nuclear science (PANSI3).

● EUROPEAN NUCLEAR STRUCTURE IN SUMMARY

Project acronym: EURONS

Funding scheme (FP6): Integrated Infrastructures Initiative (I3)

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EU project officer: Christian Kurrer

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Project webpage: <http://www.gsi.de/EURONS/>

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Universität zu Köln (DE), Johannes Gutenberg Universität Mainz (DE), Ludwig-Maximilians-Universität München (DE), Technische Universität München (DE), European Science Foundation, Nuclear Physics European Collaboration Committee (DE), University of Aarhus (DK), University of Copenhagen, Niels Bohr Institute (DK), Universidade de Santiago de Compostela (ES), Consejo Superior de Investigaciones Científicas (ES), National Centre for Scientific Research «Demokritos» (EL), Rudjer Boskovic Institute, Zagreb (HU), Commissariat à l'Énergie Atomique, Direction des Sciences de la Matière (FR), Institut National de Physique Nucléaire et de Physique des Particules (FR), Institute of Nuclear Research of the Hungarian Academy of Sciences (HU), Justus-Liebig-Universität Giessen (DE), Weizmann Institute of Science (IL), Istanbul University, Faculty of Science (TR), Jagiellonian University (PL), Warsaw University, Heavy Ions Laboratory (PL), Horia Hulubei/National Institute for Physics and Nuclear Engineering (RO), CHALMERS University of Technology (SE), Kungliga Tekniska Högskolan, KTH (SE), Uppsala University (SE), Council for the Central Laboratory of the Research Councils, CCLRC (UK), University of Liverpool (UK), Victoria University of Manchester (UK), University of Surrey (UK), University of York (UK), Universität Basel (CH)