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Current events

1. Funding for new centre for computational materials sciences at Brookhaven

The US Department of Energy (DOE) has announced USD 12 million in funding over the next four years for a new Center for Computational Design of Functional Strongly Correlated Materials and Theoretical Spectroscopy at Brookhaven National Laboratory and Rutgers University. The Center will be led by Gabriel Kotliar, a physicist at Rutgers who holds a part-time position at Brookhaven Laboratory. With additional partners from the University of Tennessee and DOE's Ames Laboratory, the scientists of the new centre will develop next-generation methods and software to accurately describe electronic properties in complex strongly correlated materials, as well as a companion database to predict targeted properties with energy-related application to thermoelectric materials.

The award is one of three announced by DOE for computational materials science research aimed at integrating theory and computation with experiment to provide the materials community with advanced tools and techniques. The projects are expected to develop open-source, robust, validated, user-friendly software and databases cataloging the essential physics and chemistry of certain classes of materials so the broader research community and industrial scientists can use these resources to accelerate the design of new functional materials.

In addition to developing computational tools, the Brookhaven team will conduct experiments to validate materials-specific predictions using the National Synchrotron Light Source II. The team will make use of computing capabilities at three DOE Office of Science User Facilities – the National Energy Research Scientific Computing Center (NERSC) at DOE's Lawrence Berkeley National Laboratory, and the Argonne and Oak Ridge Leadership Computing Facilities located at their respective national laboratories.

2. CREMLIN aims to improve European–Russian science network

A new EU project named CREMLIN (Connecting Russian and European Measures for Large-scale Research Infrastructures) has recently been launched in Moscow, Russia. The project, under the management of DESY, in which the European XFEL is also taking part, aims at connecting European and Russian research agencies more closely, with a view to using large-scale scientific infrastructures more effectively. It brings together 13 large-scale research facilities and institutions in the European Union and six in Russia.

Members of the CREMLIN consortium visiting the Protein Structure Facility at Kurchatov Institute, Moscow.

Russia is participating in European research facilities such as the European XFEL, FAIR, ESRF and LHC. In turn, CREMLIN is meant to encourage European scientists to involve themselves in new large-scale Russian projects such the fourth-generation X-ray source SSRS-4, planned at the Kurchatov Institute, Moscow.

'The project has particular importance for the European XFEL, since it can be considered as a powerful tool serving the preparation of Russian groups for the future experiments at our facility', said European XFEL Scientific Director Serguei Molodtsov.

'With CREMLIN, we are launching a joint European and Russian project, funded by the European Union, which is meant to achieve a closer and more efficient coordination of the planning, development and utilization of large-scale research infrastructures', DESY's Director Helmut Dosch emphasized at the kick-off meeting. 'In this way, CREMLIN wants to help deepen the scientific dialogue between Europe and Russia.'

3. Calum Drummond awarded the 2015 Victoria Prize for Science and Innovation

Professor Calum Drummond, Deputy Vice-Chancellor Research and Innovation and Vice-President of RMIT University, Melbourne, Australia, has been awarded the Victoria Prize in the Physical Sciences category, honouring his fundamental chemistry research, involving the Australian Synchrotron, that is enhancing industrial products and improving nanomedicine drug delivery. Drummond's research has led to design rules that were used to invent two patented drug delivery technologies, enabling drugs to be encapsulated in nanostructured material and diffused in a controlled manner to treat cancerous tumours.

The prize, awarded on 16 October 2015 at a ceremony in Melbourne, honours Drummond's contributions to understanding of key factors involved in molecular assembly in liquids, research completed in partnership with scientists on the Small and Wide Angle X-ray Scattering (SAXS/WAXS) beamline at the Australian Synchrotron.

By devising a new method of high-throughput analysis on the SAXS/WAXS beamline, Professor Drummond and his team from RMIT University and CSIRO were able to investigate thousands of liquid and liquid-crystal samples a day, greatly increasing the number of known molecules capable of self-assembling in solvents to form materials with ordered two-dimensional and three-dimensional internal nanostructures.

4. Paul Fuoss receives Lytle Award for developing differential anomalous scattering technique

Paul H. Fuoss, group leader in the Materials Science Division at Argonne National Laboratory, has received the Farrel W. Lytle Award for developing an X-ray technique that is now used worldwide to explore the structure of complex materials. The award was presented during a ceremony on 8 October 2015 at the SLAC National Accelerator Laboratory, Stanford, USA.

Fuoss had developed the technique known as 'differential anomalous scattering' in experiments conducted on an earlier generation of SLAC's Stanford Synchrotron Radiation Lightsource (SSRL). Fuoss was a graduate student at Stanford University four decades ago when he began research at SLAC's X-ray source. The scattering technique became the focus of his PhD thesis under advisor Arthur I. Bienenstock, Professor Emeritus at SLAC and Stanford and a former SSRL Director.

The Lytle Award recognizes synchrotron-based scientific achievement and efforts to grow collaborations and make experiments more efficient. A former Boeing researcher who performed numerous experiments at SLAC during his career, Lytle made important contributions to X-ray science by developing extended X-ray absorption fine structure as a spectroscopic technique to explore the local structure of materials. Fuoss' technique can be used to explore the larger-scale structure and chemical properties of a material.

Calum Drummond. Courtesy of RMIT University.

Paul Fuoss, recipient of the Farrel W. Lytle Award.