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ESTEEM: Distributed European Infrastructure of Advanced Electron Microscopy for Nanoscience

Remote regions in Europe are still lagging behind in the research stakes. Far from the heart of European technological advances, these regions are not fully exploiting the latest techniques and miss out on opportunities for economic growth as a result. The use of new technology, in particular nanotechnology, puts Europe at the centre of the innovative research map and sharpens the EU's competitive edge. Launched in July 2006, the EU-funded ESTEEM project brings European electron microscopy researchers closer together, improving cooperation and sharing infrastructure. The project also encourages the setting of common standards and carries out joint research projects, strengthening the position of European microscopy. It goes a long way to unlocking Europe's regional potential in this field, providing access to advanced electron microscopy techniques and helping European researchers stay ahead of the game.

● LARGE-SCALE NETWORKING FOR SMALL-SCALE SCIENCE

ESTEEM (Enabling Science and Technology through European Electron Microscopy) sees eleven partners from across the EU bring together major electron microscopy centres to perform a range of research activities. In order to improve access to electron microscopy and encourage cooperation among researchers using this technique, the group focuses a large part of its work on networking. The networking activities will contribute to a shared hardware and software infrastructure and will offer remote access to advanced instruments.

They will keep solid-state scientists and engineers informed of the latest developments in electron microscopy and will develop common standards for data exchange and storage. By feeding information into databases which are accessible for researchers across Europe, ESTEEM promotes an open exchange of information, benefiting all scientists using electron microscopy.

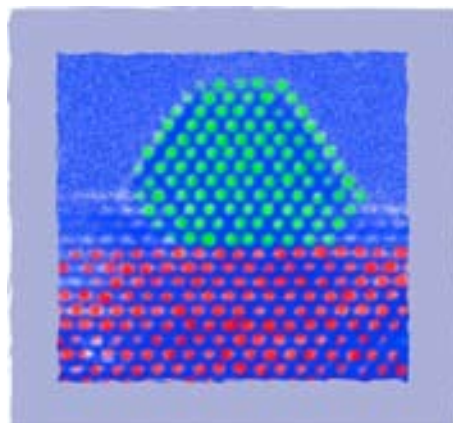
● EQUAL STANDARDS

ESTEEM's networking events include advanced workshops on maximising the recent and future developments in transmission electron microscopy for nano-materials science. The goal of these workshops is to enable scientists to acquaint themselves with the highly advanced technique of transmission electron microscopy. A special effort is made to share expertise with the newer EU Member States and also to gain knowledge from outside the EU. Other networking activities contribute to the implementation of widely accepted standards and figures of merit at the nanoscale. The aim is to produce European methodologies and protocols

for the measurement of specific quantities (spatial, physical and chemical) and to develop equipment and software. A set of internal standards will be drawn up and made available to all partners in ESTEEM and beyond. ESTEEM also focuses on enabling users to get remote access to microscopy, so that ESTEEM members can use advanced electron microscopes from anywhere in the world through user-friendly interfaces, secure access and high-speed data transfer. This will open doors for cooperation, and will ensure that a large number of scientists can benefit from expensive equipment.

● MICROSCOPIC STEPS TOWARDS NANOTECHNOLOGY LEAPS

Through a number of joint research projects, ESTEEM aims to improve three-dimensional imaging of nanoparticles down to the sub-nanometre and possibly atomic scale. It wants to push the boundaries of chemical and electronic mapping in nanostructured materials and develop improved detection in electron microscopy for rapid acquisition of images and spectra. In addition, these joint projects will develop tools for nanomanipulation experiments inside the electron microscope. These efforts will generate new technology for signal detection and will support the European nanotechnology programme. Transnational access is also high on ESTEEM's list of priorities. The project looks to open the major microscopy centres of Antwerp, Cambridge, Delft, Dresden, Orsay, Oxford, Stuttgart and Toulouse to scientists from across the EU and Associated States, ensuring equal access for scientists from in and around Europe.



● DISTRIBUTED EUROPEAN INFRASTRUCTURE OF ADVANCED ELECTRON MICROSCOPY FOR NANOSCIENCE IN SUMMARY

Project acronym: ESTEEM

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

EU financial contribution: €8.7 million

EU project officer: Hugues Crutzen

Duration: 60 months

Start date: 1 July 2006

Completion date: 30 June 2011

Project webpage: <http://esteem.ua.ac.be>

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Partners: University of Antwerp (BE), Université Paris Sud (FR), CEMES Toulouse (FR), University of Oxford (UK), University of Cambridge (UK), Technische Universität Dresden (DE), Max-Planck Institute Stuttgart (DE), Technische Universiteit Delft (NL), Josef Stefan Institute (SI), University of Cadiz (ES), University of Science and Technology (PL)