

SOME SELL THAT AS THE ORIGINAL



Getting copied is a safe indicator for a good product – in art as well as in technology. Good copies are business promoters, inspiring creativity and innovation. Even the best copy lacks originality and spirit. Without that, the copy is a dead-end lane.

For the past two decades, Hecus products have kept the copyists busy. Poor copies have stimulated our own drive for innovation to the benefit of our customers.

office@hecus.at



A history of innovation

Hecus X-Ray Systems is the leading, specialized innovator in the field of small-angle x-ray scattering, SAXS.

We have turned it into a practical analytical tool for non-destructive laboratory testing. The list of key innovations is impressive:



- 1993: SWAXS - simultaneous small- and wide-angle scattering
 - 2000: SAXS for process control in chemical industry
 - 2006: 'True SAXS', ultra-high brilliance microfocus SAXS S3-MICRO
 - 2007: Thin-film, grazing-incidence SAXS, X-ray reflectometry
 - 2009: 'Absolut SAXS', S3-MICROpix
- And there is more to come...

Our focus on SAXS has made us the fastest growing player in this competitive field.



DOE Announces up to \$52.5 Million for Concentrating Solar Power R&D

The U.S. Department of Energy announced in July plans to provide up to \$52.5 million to research, develop, and demonstrate concentrating solar power systems capable of providing low-cost electrical power both day and night. The announcement underscores the Obama Administration's commitment to making electricity generated from solar energy competitive with conventional grid electricity.

"Low-cost renewable energy generation that includes energy storage is one key to our efforts to diversify domestic energy sources and create new jobs," Energy Secretary Steven Chu said. "By investing in the development of low-cost solar technologies we can pave the way toward faster deployment of carbon-free, large-scale energy sources."

Concentrating solar power (CSP) technologies concentrate the sun's energy and capture that energy as heat, which then drives an engine or turbine to produce electrical power. CSP plants can include low-cost energy storage. CSP technologies currently used in utility-scale power plants typically do not have the capability/capacity for storage, operating only during daytime hours. These projects will seek to improve technology and novel system designs to extend operation to an average of about 18 hours per day, a level of production that would make it possible for a CSP plant to displace a traditional coal power plant.

The competitive funding opportunity involves two areas. One area is research and development of concepts and components for a CSP system that will enable a plant to produce low-cost electricity at least 18 hours of the day. The other area is evaluation of the feasibility and development of a prototype of a complete CSP system capable of operating at least 18 hours per day while generating low-cost power.

Projects are based upon continuing annual appropriations. DOE anticipates making up to 13 project awards totaling up to \$52.5 million.

U.S.-China Clean Energy Research Center Announced

U.S. Energy Secretary Steven Chu, Chinese Minister of Science Wan Gang, and Administrator of National Energy Administration Zhang Guo Bao announced in July plans to develop a U.S.-China Clean Energy Research Center. The Center would facilitate joint research and development on clean energy by teams of scientists and engineers from the United States and China, as well as serve as a clearinghouse to help researchers in each country. Priority topics to be addressed will initially include building energy efficiency, clean coal including carbon capture and storage, and clean vehicles. Both countries together pledged \$15 million to support initial activities.

"The U.S. and China are two great nations, and clean energy is one of the great opportunities of our time," said Chu. "Working together, we can accomplish more than acting alone."

The Center will have one headquarters in each country, at locations to be determined. U.S. and Chinese officials will discuss elements of the Center in the months ahead, with the objective of launching initial operations by year end.

Science and technology (S&T) have long been a cornerstone of U.S.-China cooperation. DOE currently manages 12 agreements with China under the S&T framework on a wide variety of energy sciences and technologies including building and industrial energy efficiency, clean vehicles, renewable energy, nuclear energy and science, and biological and environmental research.

Europe Committed to Maintaining Safety and Progressing Toward More Sustainable Nuclear Reactors

The European Commission (EC) is committed to supporting research on safety and increased sustainability of nuclear power

plants and on optimizing the management of radioactive waste from the nuclear fuel cycle. In this way, research contributes to providing answers to citizens' concerns regarding the use of nuclear energy in general, and to how this technology can provide safe, sustainable, and competitive energy as part of a future low-carbon economy, according to the EC. These were some of the key messages coming from the 7th conference on the European Union (EU) research and training activities in reactor systems and safety, FISA 2009, conducted in June in Prague. The conference, drawing 450 experts in nuclear research including many from outside the EU, was organized by the European Commission's Directorate-General for Research as a showcase event for on-going research carried out within the Euratom Framework Program.

Research on reactor systems over the last decades has brought about significant technological progress since the first generation of commercial power reactors half a century ago. Current research is turning its focus to the development of 4th-generation reactors, which is expected to be commercially deployed in the next decades. However, research is also continuing to improve the performance and extend the lifetime of existing generation-II and III power plants, while ensuring high levels of safety are maintained. The FISA 2009 conference illustrated how the Euratom Framework Program in the area of nuclear fission is contributing effectively to all these areas of research as part of a more strategic approach to nuclear research in general in Europe.

Previous participants in the Euratom Framework Programs (FP5 and FP6) set the scene for this more strategic approach. A number of coordination and networking actions identified end-user and common research needs, and key integrated projects and networks of excellence, each with significant EC funding, were launched in the main thematic issues. This long-term research effort is continuing under the current Euratom Framework Program (FP7) with the launch of further key collaborative projects in key topics. In addition, the progress of integration has been taken to the next stage with the launch of Technology Platforms, bringing the main research and development stakeholders together around a common vision for research, development, and demonstration.

The first is the Sustainable Nuclear Energy Technology Platform (SNETP), launched with the support of the European Commission in September 2007 and gathering together industry, research

organizations, and other actors around a common vision for future research in the broad field of nuclear systems and safety. The platform's Strategic Research Agenda (SRA), gathering contributions from about 200 European scientists over a period of 18 months, was unveiled in its final published form at FISA 2009.

SNETP also provides valuable input to the nuclear research community's Strategic Energy Technology (SET) Plan, which gathers together the low-carbon technology aspects of the Energy Policy for Europe. In particular, the European Industrial Initiative in sustainable fission, foreseen in the SET-Plan, is closely aligned with the sustainability pillar of SNETP's SRA.

Australia Joins International Renewable Energy Agency

In June, Australia became a member of the International Renewable Energy Agency (IRENA), further strengthening Australia's global leadership role in renewable and low emission energy.

The Minister for Resources and Energy, Martin Ferguson AM MP, who is representing Australia at the meeting of foundation members in Sharm El Sheikh, Egypt, said, "IRENA provides an unparalleled opportunity for Australia to work cooperatively with more than 125 countries to further the development and deployment of renewable energy technologies. In joining IRENA, Australia recognizes the role many countries, and particularly Germany, have played in driving the establishment of this institution."

Joining IRENA is another example of Australia's commitment to international engagement on climate change and energy issues and comes only three months after the Government established the Global Carbon Capture and Storage Institute. To date, 16 governments, and more than 60 companies and NGOs have joined the Australian Government-funded institute.

"Australia's participation in IRENA is a natural extension of our strong domestic action to promote and deploy renewable energy, which includes the introduction of the Carbon Pollution Reduction Scheme, a Renewable Energy Target of 20% by 2020, and the \$4.5 billion Clean Energy Initiative," Ferguson said.

The Clean Energy Initiative includes \$2.4 billion for carbon capture and storage technologies; \$1.6 billion in solar technologies; and \$465 million to establish the Australian Centre for Renewable Energy to support the development and commercialization of renewable energy technologies in Australia.

Ferguson said, "This level of investment in clean energy is unprecedented in Australia and demonstrates the Government's commitment to increasing the use of renewable energy technologies in a cost-effective manner.

"However, it is important to recognize that not all countries enjoy the energy options available to Australia and that some countries are grappling with natural, economic, and technical barriers to the greater use of renewable energy.

"Through IRENA, member countries have the opportunity to access the latest information on renewable energy technology to help increase their access to the most appropriate renewable energy for their domestic energy needs. I am confident that through IRENA, Australia will be able to further the adoption of renewable energy around the world and promote Australia's industrial capacity in this essential industry."

SA Study Shows Increase in Women Participating in Science, Engineering, and Technology Sectors

Facing the Facts 2009 is a study commissioned by the Science, Engineering and Technology for Women (SET4W) committee, one of the sub-committees of the National Advisory Council on Innovation (NACI) established to advise the Ministry of Science and Technology in South Africa on how to achieve gender equity in the sectors.

It follows on a similar study done in 2004, and provides key highlights of the trends regarding the number of women participating in the SET sectors.

The study was developed from the 2008 Monitoring and Evaluation Framework intended to benchmark the participation of women in SET within the National System of Innovation (NSI). It was populated for the first time in 2008 with the available data from 2000 to 2005.

Facing the Facts 2009 suggests marked improvements during the past half decade, clearly evident at lower levels, but also documents challenges that remain within various areas of SET.

Some of the key findings of the study released in August focused on the areas of the future SET workforce in terms of enrollments and graduates from 2000 to 2005, human resources for SET, and publishing.

In terms of enrollments, women made up 53–54%, mostly at undergraduate and lower postgraduate levels. Women also made up the majority of graduates in these levels, 56–59%. Female enrollments (42–45%) and graduates (42–45%) at upper-postgraduate level are in the minority, but slowly approaching the 50% mark.



COMPLETE SYSTEM RANGE
for
SAXS / SWAXS/ GISAXS

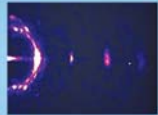
S3-MICROpix



ULTIMATE PERFORMANCE

Primary Beam
Needle
Tip 1 Pixel

DOPC dry
on Si chip
(10 min)

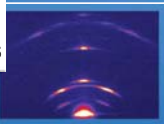


S3-MICRO



BRIDGING THE GAP TO SYNCHROTRONS

Lipidic Nanofilm -
GISAXS (100s)



PRECISION
SPEED
FLEXIBILITY

System3



THE VERSATILE

THE
Spirit
OF INNOVATION

www.hecus.at ... office@hecus.at

In human resources for SET, women make up the minority of research and development staff at 40%. The majority of women with doctorates in SET were employed in the higher education and business sectors between 2003 and 2005. And women in higher education exceeded 50% at lecturer and junior lecturer levels, but far less than 50% were employed at senior lecturer, professor, and associate professor levels.

Women represented a third of all publishing scientists in South Africa and they accounted for a quarter of all scientific articles produced in South Africa.

The report also discussed areas that warrant further intervention. The report noted low women doctoral enrollments and black women graduates and low numbers of women at upper-postgraduate levels. Women have low representation in engineering, sciences, and applied technologies. They have low publication rates and are under-represented within the total number of South African scientists. Women are underrepresented among research and development staff at senior levels, that is, senior lecturers, professors, and associate professors. There is a general under-representation of black women among academic staff. And there is little funding for women in the engineering, sciences, and applied technologies sector.

The Minister said the updated *Facing the Facts Booklet* was an important contribution to the Department of Science and Technology's efforts to mainstream women in the SET sectors.

"In a bid to ensure a sustainable knowledge-based economy, the Department is also taking account of the importance of incorporating the talents of women into the SET workforce and academia. The Department will continue to make an effort to attract more women to careers in SET and retain them," said Minister Pandor.

With these persisting gender inequality challenges, she called on public and private stakeholders as well as the media to take ownership of this booklet and use it to inform their strategic decisions in their respective academies and other workplaces in the sectors.

The Minister said without such a concerted effort by all affected stakeholders, South Africa will continue to face gender inequality.

A copy of the report can be obtained from the NACI Secretariat, Private Bag X 894, Pretoria 0001, South Africa; tel. 27-(0)-843-6511; fax 27-(0)-12-349-1060; or www.naci.org.za. □

Advertisers in This Issue

	Page No.
Asylum Research	Outside Back Cover
Bruker AXS, Inc.	Inside Back Cover
Hecus X-Ray Systems GmbH	714, 716
High Voltage Engineering	Inside Front Cover
Janis Research Company	710
JEOL USA, Inc.	705
Kavli Foundation	706
MMR Technologies, Inc.	711
National Electrostatics Corporation	737
Omniprobe, Inc.	731
Veeco Instruments, Inc.	709

For free information about the products and services offered in this issue, check http://www.mrs.org/bulletin_ads.