Lightspeed

Australian Synchrotron News

March 2010

FROM THE ACTING DIRECTOR

George Borg,
Acting Director,
Australian Synchrotron.

Over recent weeks, the Australian Synchrotron has made progress in several areas, including the development of an investment case to fund operations and capital expansion post-2012. Initial feedback from our Foundation Investors has been positive and supportive. This investment case together with the development of science case 2 (see ASDP update article) will put us in a strong position to secure funding beyond 2012.

Another exciting development is the recruitment of four new members to our Science Advisory Committee (SAC). We are privileged to have the expertise of Lisa Miller from the National Synchrotron Light Source, who has synchrotron science experience in osteoarthritis and Alzheimer's disease. The other new appointees are Keith Nugent, Brendan Kennedy and Michael Hart. These eminent scientists join the committee's newly-appointed Chairman, Ted Baker, on an impressive expert panel that will strengthen the scientific achievements of the Australian Synchrotron (see SAC article).

Finally, the Australian Synchrotron continues to contribute to international synchrotron science. In February, we supported the joint meetings of Biology & Synchrotron Radiation and Medical Applications of Synchrotron Radiation, which attracted hundreds of Australian and overseas participants, including Nobel Prize winner Ada Yonath. We are proud to see our scientists and users continuing to achieve peer recognition and look forward to continued success in the future.

BEAMTIME APPLICATIONS

Beamtime submissions for round 2010/2 (June – August 2010) have closed.

Submissions will open again on 1 June 2010 for round 2010/3 (September-December 2010).

Key dates for beamtime submissions are listed on the synchrotron website: www.synchrotron.org.au/index.php/features/applying-for-beamtime/2010-proposals-schedule.

If you would like to discuss your ideas for future beamline proposals with the beamline scientists at the Australian Synchrotron, please allow plenty of time.

For more information about applying for beamtime at the Australian Synchrotron, contact the User Office: user.office@synchrotron.org.au

In this issue:

UP TO SPEED

This month our short interview features Adam Michalczyk, a senior electronics engineer at the Australian Synchrotron.

Describe your job in 25 words or less.
I manage and design electronic systems for the facility and support engineers, physicists and beamline scientists in their day-to-day work, using the new laboratory we've established.

Best aspect of your job?
Among many good aspects I would highlight opportunities to learn cutting-edge technologies, very good access to training courses and internal training in RF (radiofrequency) technologies.

EXAMINING THE FINE PRINT

Invisible (latent) fingerprints provide clues for police investigating a crime scene, but can be difficult to detect. Synchrotron science could help improve existing detection techniques as well as leading to new approaches to the forensic analysis of latent fingermarks.

Australian researchers are using infrared microspectroscopy at the Australian Synchrotron to investigate how the chemistry of latent fingermarks changes over time. Fingermarks typically contain natural waxes, oils, aqueous components and contaminants.

Chemistry honours student Patrick Fritz from Curtin University of Technology recently visited the synchrotron to analyse latent fingermark samples from subjects aged seven to 60, collecting data from several tiny spots on each fingerprint.

Synchrotron infrared microspectroscopy is non-destructive and highly sensitive. Its high spatial resolution means researchers can select very small areas for imaging and avoid debris such as skin cells. Preliminary results show this synchrotron technique is particularly good for studying oils and fats in fingermark deposits, and could reveal more information as the fingermarks age.

Patrick will return to the synchrotron several times to see how the fingermark chemistry changes as the samples age.

More: http://www.synchrotron.org.au/index.php/aussyncbeamlines/infrared-micro/highlights-ir/examining-the-fine-print

LH photo: Australian researchers are studying the chemistry of fingermarks collected on gold and stainless steel plates. Photo: Simon Lewis, Curtin University of Technology.
RH photo: Patrick Fritz (right) and his supervisor Simon Lewis from Curtin University of Technology are using synchrotron IR microspectroscopy to examine fingermarks from people aged seven to 60.

ASDP UPDATE

The Australian Synchrotron Development Plan (ASDP) process is up and running again after a temporary lull in activity over the New Year period.

Towards the end of 2009, 11 major project submissions were finalised and accepted for progression to the next stage of the ASDP process, which will ultimately lead to the production of science case 2: a roadmap for the development of the Australian Synchrotron over the next decade.

Several smaller projects have been grouped together in a 'major facility upgrades' project that will also go forward within the ASDP process.

In consultation with Professor Ted Baker, chair of the reconstituted Science Advisory Committee (SAC), we are coordinating a review of all projects by

Worst aspect of your job?
Our BBQ, which gives us a chance to talk with other staff members, is only once a week.

Apart from the Australian Synchrotron, what's the coolest job you've ever had?
Riding Arabian racing horses. I still wear some scars from them.

Your favourite overseas destination and why?
Definitely Poland - but not just for the Kranskis. Poland is my and my wife's homeland with all our childhood memories.

A little-known fact about the Australian Synchrotron?
Poland planned to build a synchrotron in Cracow, based on the design of the Australian Synchrotron. The project was downsized by the government recently but is still going ahead.

What is the biggest achievement to date for your section at the Australian Synchrotron?
Establishing the RF, Electronics and Integration laboratory from scratch was a great achievement, and so is our own original, in-house printed circuit. Hopefully there will be many more to come.

What is the biggest challenge for your section at the Australian Synchrotron?
Attention to quality and detail. Considering the size and complexity of the synchrotron, nothing less than excellence is accepted by our facility in order to ensure high beam availability.

international experts whose reports will subsequently be considered by SAC and a soon-to-be-formed consultative group of local scientists. This will determine the final prioritised list that will form the basis of the new science case.

We look forward to reporting more exciting progress in coming months.

SCIENCE ADVISORY COMMITTEE

The Australian Synchrotron has announced the appointment of four new members to its Science Advisory Committee:

- Keith Nugent, Professor of Physics, The University of Melbourne
- Lisa Miller, National Synchrotron Light Source, Brookhaven National Laboratories
- Brendan Kennedy, Professor of Chemistry, The University of Sydney
- Michael Hart, Emeritus Professor of Physics, University of Manchester.

They join Mitchell Guss, Professor of Molecular and Microbial Biosciences, University of Sydney, who was appointed to the committee late last year, and Professors Ted Baker (Chair), Hongjie Xu, Soichi Wakatsuki and Janet Smith.

More: http://www.synchrotron.org.au/index.php/about-us/governance-committees/science-advisory

ITALIAN-AUSTRALIAN WORKSHOP

At the Fourth Italian-Australian Synchrotron Workshop held in Melbourne in February, 30 of Italy and Australia's brightest and best researchers discussed cutting-edge synchrotron techniques that are helping to provide health, economic and social benefits around the globe.

The 2010 'Photons for Medicine and Materials Science' workshop focused on applications of synchrotron radiation in life sciences, material science, instrumentation, free electron lasers and biomedical sciences.

George Borg, Acting Facility Director of the Australian Synchrotron, said the workshop was "an invaluable opportunity for experts from both facilities to share knowledge and experience. We look forward to a close collaborative relationship for many years to come".

Kevin Prince, Head of Spectroscopy at Elettra and an expatriate Australian, said the workshop meetings helped the two synchrotrons to use their synergies to achieve common goals in important areas of materials science as well as medicine.

This annual workshop is supported by the Italian Embassy and the Commonwealth of Australia under the International Science Linkages program.

More:
http://www.synchrotron.org.au/index.php/news/events/australian-

EVENTS DIARY

AUSTRALIAN EVENTS

Australian Synchrotron-ANZAAS Winter School
12-15 July 2010
Melbourne

Hosted by the Australian Synchrotron in conjunction with ANZAAS, the second annual Winter School on Synchrotron Radiation Science aims to assist early-career researchers to develop an understanding of synchrotron radiation.
More:
http://www.synchrotron.org.au/index.php/news/events/australian-events/event/56-australian-synchrotron-winter-school

EVENTS OUTSIDE AUSTRALIA

For additional information and listings, see
lightsources.org/cms/?pid=1000068

IPAC'10
23-28 May 2010
Kyoto, Japan

The First International Particle Accelerator Conference combines the three regional particle accelerator conferences previously held in Europe, America and Asia.

Deadline for early registration is 23 March 2010. Standard registration deadline is 9 April 2010.

More: ipac10.org

SRMS / MEDSI 2010
11-14 July 2010
Oxford, UK

The 7th International Conference on Synchrotron Radiation in Materials Science (SRMS-7) and the 6th International Conference on Mechanical Engineering Design of Synchrotron Radiation Equipment and Instrumentation (MEDSI) will be held jointly.

More:
srmsmedsi2010.org/srmsmedsi.html

VUVX2010
11-16 July 2010
University of British Columbia
Vancouver, British Columbia, Canada

events/event/53-italian-australian-workshop

Italian and Australian researchers met recently in Melbourne to discuss cutting-edge synchrotron techniques.

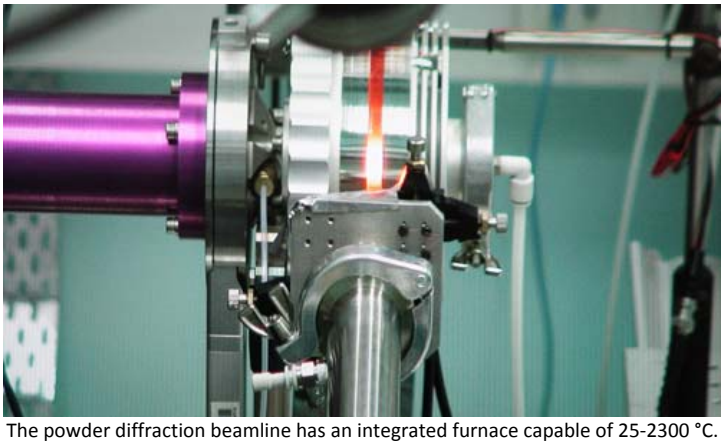
BEAMLINE FOCUS

Hot News

The powder diffraction beamline now has an integrated furnace capable of a temperature range of 25-2300 °C.

In December 2009, Mark Styles and his colleagues from The University of Melbourne and CSIRO were among the first to test-drive the latest sample environment ancillary available at the Australian Synchrotron's powder diffraction beamline.

Styles and his colleagues are examining the oxidation mechanism of Ebonex^{TM}, a commercial electrode material consisting of the Magnéli phases Ti_4O_7, Ti_5O_9 and Ti_6O_{11}. These phases display appreciable electrical conductivity and corrosion resistance up to around 400°C, but at higher temperatures they begin to oxidise to the non-conductive rutile phase TiO_2. The researchers conducted an in-situ experiment at the Australian Synchrotron powder diffraction beamline to investigate the effects of temperature and atmospheric oxygen concentration on phase composition as a function of time. An understanding of the oxidation mechanism may assist in designing protective surface layers that allow these electrode materials to operate at higher temperatures.



The powder diffraction beamline has an integrated furnace capable of 25-2300 °C.

The 37th International Conference on Vacuum Ultraviolet and X-ray Physics will cover the development of synchrotron, laser and plasma-based VUV, soft x-ray and hard x-ray sources, and novel applications.

More: www.vuvx2010.ca/

11th SXNS Conference

14-17 July 2010
Northwestern University, Evanston (nr Chicago), Illinois, US

The Eleventh International Conference on Surface X-ray and Neutron Scattering brings together researchers studying surfaces and interfaces of solid, liquid, biological and soft matter via neutron or x-ray (either hard, soft, or EUV) scattering techniques.

More: www.sxns11.northwestern.edu

SPIE Optical Engineering + Applications

1 - 5 August 2010
San Diego Convention Center
San Diego, California, US

This major symposium covers classical optical R & D, design, and engineering, as well as technologies and systems for use in optical systems, remote sensing, and illumination engineering. Events of interest to synchrotron scientists include the following two conferences:

• Advances in X-Ray/EUV Optics and Components V (OP321)

• Developments in X-Ray Tomography VII (OP323).

More:
spie.org/optical-engineering.xml

XRM-2010

15-20 August 2010
Chicago, USA

The Tenth International Conference on X-ray Microscopy will cover the latest developments in methods and instrumentation, including x-ray sources, optics, detectors, and groundbreaking applications in biological and biomedical, environmental, earth, space, condensed matter, and materials sciences.

More: xrm2010.aps.anl.gov

FAST FUNDING OPPORTUNITY

The French-Australian Science and Technology (FAST) program is calling for funding applications in the life sciences (including medical and health sciences), environmental sciences and energy.

The FAST Program aims to promote and facilitate scientific and technological cooperation between Australian and French researchers. It provides funding support for international travel to France, and domestic travel and living expenses associated with participation in research projects in France. Funding does not extend to insurances, salaries or equipment expenses.

Deadline for applications is 12 March 2010.

In 2009, Australian Synchrotron infrared scientists received FAST funding to exchange expertise with French colleagues at the Soleil Synchrotron in Paris. Mark Tobin and Ljiljana Puskar visited France to acquire new skills that will enable them to study materials under extreme pressure conditions using diamond anvil cells. In exchange, an IR beamline scientist from Soleil visited Australia to learn from the Australian Synchrotron's expertise in using micro-fluidic cells to study live microbiological systems in aqueous media.

More information, including the FAST program guidelines and online application form: http://grants.innovation.gov.au/ISL/Pages/Home.aspx

A PRIZE OPPORTUNITY

Nominations for the Prime Minister's Prizes for Science 2010 are now open. The closing date is 21 May 2010.

Every year the Australian Government awards five prizes for outstanding scientific achievements and excellence in science teaching. Each of these highly prestigious awards includes tax-exempt cash components totalling $500 000.

- The Prime Minister's Prize for Science
- The Malcolm McIntosh Prize for Physical Scientist of the Year
- The Science Minister's Prize for Life Scientist of the Year
- The Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools.

The awards are offered to Australian citizens or permanent residents of Australia. Nominators must be personally knowledgeable about the nominated achievements and able to offer expert opinions on its worth. Self-nominations will not be considered.

Online nominations:
http://grants.innovation.gov.au/SciencePrize/Pages/Overview.aspx
Enquiries or expressions of Interest: pmprize@innovation.gov.au

ANOTHER FUNDING OPPORTUNITY

For the first time, the Australian and German Governments have agreed to provide funding to seed future collaborative research partnerships in key areas of importance for both countries.

The Australian Government is providing $450,000 through the International Science Linkages program in 2010-11, to be matched by the German Government.

SPACE FOR YOUR EVENT

To submit your synchrotron-related event for listing in Lightspeed and on the Australian Synchrotron website, click here:
www.synchrotron.org.au/index.php/news/events/list-an-event-on-this-site

RADIATION PHYSICS AND CHEMISTRY

Australian Synchrotron user Christopher Chantler has succeeded Dr Paul Bergstrom as Editor in Chief of the Radiation Physics and Chemistry journal.

Chris Chantler is an Associate Professor and Reader at the School of Physics, University of Melbourne. His interests encompass experiment and theory, technical developments and new fundamental insights across physics and chemistry, atomic and condensed matter science.

Australian Synchrotron user Stephen Best, also from The University of Melbourne, is one of three new associate editors.

USE OF LIGHTSPEED MATERIAL

Senator Kim Carr, Minister for Innovation, Industry, Science and Research, said the new funding was mutually beneficial and would "allow Australian researchers to make the most of their strengths by taking part in exchanges and collaborations with their German counterparts".

Europe's largest economy, Germany is Australia's fourth most important collaborator as measured by joint publications, behind the US, UK and just recently China.

Joint research projects will range across areas such as solar photovoltaics, environmental science, information and communication technology, geosciences, marine sciences and nanotechnology.

More information on how to apply: www.science.org.au

FRESH SCIENCE 2010

This annual event encourages early-career researchers from around Australia to get their stories out to local, national and international media, and gives them essential communication skills.

To be held in Melbourne from Monday 7 to Thursday 10 June 2010, Fresh Science will provide media training for 16 selected early-career researchers, who will then present their work to the media, schools and the public.

The selection panel is looking for:

- early-career researchers (from honours students to no more than five years post-doc)
- a peer-reviewed result which has had no media coverage
- some ability to present ideas in plain English.

Nominations are now open and close Thursday 25 March 2010.
More information and the online nomination form are at www.freshscience.org.au

Fresh Science is supported by the Federal Government, New Scientist and Museum Victoria.

A DAM FINE PERFORMANCE

This summer, the Australian Synchrotron is again playing host to a family of ducklings.

Please drive slowly when you visit the synchrotron, as the ducks cross the car parks and central roadway several times a day.

Mother and father duck give their five new ducklings some swimming practice on the synchrotron dam.

READER FEEDBACK

Lightspeed welcomes your comments and suggestions. Please send these to: info@synchrotron.org.au with 'Lightspeed comments' in the subject line.

CAREERS AT THE AUSTRALIAN SYNCHROTRON

The Australian Synchrotron offers a unique working environment for a wide range of specialists. More information on job postings: www.synchrotron.org.au/index.php/about-us/working-at-the-synchrotron/employment-opportunities

MORE INFORMATION

A list of Australian Synchrotron personnel can be found at www.synchrotron.org.au/index.php/about-us/working-at-the-synchrotron/staff-contact

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Supported by

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