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1. VICTORIAN CABINET ANNOUNCES SYNCHROTRON IMAGING AND MEDICAL THERAPY CENTRE

On 12 February 2008, members of the Victorian Cabinet visited the Australian Synchrotron to take part in a ceremony to mark the start of construction of the Imaging and Medical Therapy Centre.

The \$10 million Centre will house experimental facilities for the imaging and medical therapy beamline. A major focus of the beamline will be the development of microbeam radiation therapy techniques, which are based on the observation that an array of very thin x-ray beams can destroy a tumour without damaging normal tissue surrounding the tumour.

Non-medical uses of the imaging and medical therapy beamline could include studies of how agricultural crop plants cope with drought and high salt levels, and the development and assessment of advanced materials.

Catherine Walter, Chair of the Australian Synchrotron Company, said the new Centre would position the synchrotron within the top three synchrotron facilities world-wide in the field of biomedical imaging and therapy research.

Members of the Victorian Cabinet also attended presentations by synchrotron staff and toured the facility to learn more about its initial suite of nine beamlines.



L to R: The Hon Gavin Jennings (Victorian Minister for Innovation), Professor Tony Burgess (Ludwig Institute for Cancer Research), and the Hon David Andrews (Victorian Minister for Health) mark the start of construction of the Australian Synchrotron's Imaging and Medical Therapy Centre.

Victorian Government Ministers who took part in the visit included Jacinta Allan (Regional & Rural Development, Skills & Workforce Participation), Daniel Andrews (Health), Peter Batchelor (Energy & Resources, Community Development), Gavin Jennings (Environment & Climate Change, Innovation), John Lenders (Treasurer), James Merlino (Sport, Recreation, Youth Affairs), Maxine Morand (Children & Early Childhood Development, Womens Affairs), Lisa Neville Mental Health, Community Services, Senior Victorians), Bronwyn Pike (Roads & Ports), Tony Robinson (Gaming, Consumer Affairs) and Richard Wynne (Housing, Local Government, Aboriginal Affairs).

To view an animation of the new beamline, go to:
<http://www.youtube.com/watch?v=XQa-XVNLfz4>

2. INDIAN DELEGATION VISITS AUSTRALIAN SYNCHROTRON

An Indian government delegation led by the Minister for Science & Technology and Earth Sciences, Shri Kapil Sibal, visited the Australian Synchrotron on 11 February 2008.

The Minister was accompanied by Dr Y.P. Kumar, head of the Division of International Science and Technology Cooperation in the Indian Department of Science and Technology, the Indian High Commissioner Mrs Sujatha Singh, and the Consul General of India in Melbourne, Ms Anita Nayar. The group toured the facility and participated in high-level discussions on future collaborative arrangements between India and the Australian Synchrotron.



Synchrotron director Rob Lamb (RHS) with Shri Kapil Sibal, Indian Minister for Science and Technology, who visited the Australian Synchrotron in February 2008.

3. SYNCHROTRON USERS GAIN POWERFUL INSIGHTS

The joint ASRP-Australian Synchrotron Users Meeting held in Melbourne in December 2007 attracted around 300 participants.

The first national conference of synchrotron scientists since the Australian Synchrotron was officially opened in July 2007, the Users Meeting featured presentations by international and Australian synchrotron experts, including representatives from similar facilities in Japan, Germany and Italy.

Keynote speakers included Professor Michael Grunze from the University of Heidelberg, Professor Soichi Wakatsuki from the Photon Factory and Dr Kevin Prince from the Elettra Synchrotron.

Australian synchrotron experts who spoke at the conference included Professor Peter Lay from University of Sydney, and Dr Philip Heraud and Dr Bayden Wood, both from Monash University. These three scientists have

already made significant advances using the Australian Synchrotron's unique research capabilities.

Professor Lay and his research team are using synchrotron techniques to develop ground-breaking new methods for identifying and treating cancer.

Dr Heraud and his colleagues are using the synchrotron for a range of medical and environmental studies. One project involves investigating how phytoplankton could react to the environmental conditions likely to accompany climate change. These tiny aquatic organisms fix around 65 thousand million tonnes of atmospheric carbon each year. If changing environmental conditions reduce the nutrient supply available for phytoplankton, this could have a big impact on global carbon cycles.

Dr Wood and his colleagues, including reproductive biologist Dr Orly Lacham-Kaplan, are using synchrotron infrared techniques to study how egg cells change during maturation. Their aim is to identify the profile of normal eggs and, ultimately, to improve the success rate of human IVF procedures.

For more information on the meeting, go to: http://www.synchrotron.org.au/content.asp?Document_ID=5138

4. BEAMLINE NEWS

Powder Diffraction Beamline

Nick Perkins has joined the Australian Synchrotron as scientific support officer on the powder diffraction beamline.



New PD staff member Nick Perkins

Nick has a PhD in inorganic chemistry from ANU, where he undertook spectroelectrochemical studies on heavy-metal chain-complexes. For the past few years, he has been working in environmental and atmospheric chemistry, most recently as an emergency response officer with EPA Victoria.

Kia Wallwork, Powder Diffraction Beamline Scientist

Protein Crystallography Beamline

The PX team welcomed two new staff in December 2007: Rachel Williamson as scientific support officer and Trevor Huyton as scientist.

Rachel has a PhD in Chemistry from Massey University (New Zealand) and post-doctoral research experience in synthetic biochemistry at MedSafe (NZ), Los Alamos National Laboratory (USA) and The University of Melbourne, where she was also a journal editor.

Trevor Huyton is a biophysics PhD from the University of London with post-doctoral research experience in protein crystallography at Walter and Eliza Hall Institute, Howard Hughes Medical Institute (USA), Johns Hopkins University School of Medicine (USA) and Monash University.

The 3-BM1 end-station upgrade has been completed. The ADSC Q210r area detector has been installed and commissioned ready for the user program to resume in mid February. This end-station now offers full remote access and robotic operation, which means that remote users can operate the beamline from offsite.

Julian Adams, PX Beamline Scientist



The 3-BM1 end station in final installed configuration.

Microspectroscopy Beamline

Martin de Jonge has joined the Australian Synchrotron as scientist with the microspectroscopy beamline. He will use his experience with using differential phase contrast (DPC) imaging on the scanning transmission x-ray microscope at the Advanced Photon Source in Chicago to develop further x-ray imaging modalities at the Australian Synchrotron. DPC techniques can provide quantitative high-contrast images of biological and materials specimens. Martin's PhD thesis (Melbourne University, 2005) on measurements of fundamental x-ray optical parameters was awarded the Melbourne University Chancellor's Prize and the ASRP Thesis Medal.

The beamline's radiation enclosures are being constructed by Caratelli (France) and Industrial Conveying Australia Pty Ltd (ICA) from Bendigo.

David Paterson, Microspectroscopy Beamline Scientist



The Hon Jacinta Allen, Victorian Minister for Skills and Workforce Participation, Member for Bendigo East, (second from right) with George Borg, Senior Project Manager, WorleyParsons (RHS) and ICA staff inside the microspectroscopy beamline hutch.

SAXS/WAXS Beamline

The SAXS/WAXS beamline has appointed a new scientist, Stephen Mudie. Stephen holds a PhD from Monash University and was previously an ASRP Research Fellow at CSIRO in Clayton, where he worked on collaborative SAXS analysis projects with researchers from CSIRO, Monash and other Australian organisations.

Beamline construction is going well. The contract to supply both major detectors for the SAXS/WAXS beamline has been awarded to Dectris P/L, a spin-off company of the Paul Scherrer Institute, Switzerland. The beamline will be supplied with two Pilatus detectors, the new generation of solid-state photon counting detectors. These are the most advanced large area two-dimensional x-ray detectors available, and their very high dynamic range, ultra-low noise, high count speed and high framing performance will allow SAXS and WAXS users to conduct experiments not previously possible.

The beamline photon delivery system has been factory-tested at FMB-Oxford (Oxford, UK) and is on track for delivery on schedule. The 3-metre in-vacuum undulator was installed into the storage ring in January 2008 and the shielding enclosures are under construction. The sample table and the large SAXS table have been designed and are now under procurement; the SAXS camera and the beamline controls and data acquisition system are in the final design stage.

Nigel Kirby, SAXS/WAXS Beamline Scientist

Infrared Beamline

To help meet the high demand for the IR beamline's microscope system, a second IR microscope will be installed later in 2008. This system will be equipped with a focal plane array detector and will undergo detailed evaluation and commissioning before becoming available to users. Jointly funded by the Australian Synchrotron and

Monash University, the new microscope will share the IR beam with the high resolution FTIR system.

The IR team is in the process of installing and testing an upgraded focusing mirror for the high resolution beamline branch.

Mark Tobin, IR Beamline Scientist

Soft X-ray Beamline

The soft x-ray beamline team has recruited two new staff members. Dr Lars Thomsen will take up the position of scientist in April 2008. Anton Tadich will join the team in February 2008 as scientific support officer.

Lars is currently a post-doctoral research associate at the University of Newcastle, NSW, where he gained his PhD in 2004. His research interests include the field ionisation properties of carbon nanotubes in ultra high vacuum. A Danish citizen with two science qualifications from Odense University, Lars has used synchrotrons in Denmark, Japan, Korea, Taiwan and the USA.

Anton is a physics PhD student at La Trobe University. He plans to submit his thesis in angle resolved photoemission spectroscopy (ARPES) shortly. Anton used the BESSY2 synchrotron in Germany during his doctoral studies, and has given many presentations to community and school groups on behalf of the Australian Synchrotron project.

In December 2007, Prof. Alan Buckley from the University of NSW School of Chemistry officially became the first user of the soft x-ray beamline. One of the prime instigators of this beamline, Alan has been keen to ensure that it can accommodate the photon energies (up to 2.5 KeV and possibly higher) required for NEXAFS studies at the sulphur K edge. Soft x-ray beamlines typically have lower photon energy cut-offs of around 2 KeV. By obtaining experimental spectra from a standard sample, molybdenite (MoS₂), and comparing these with published spectra, Alan has shown that the Australian Synchrotron beamline can be used for measurements at the required photon energy.

Bruce Cowie, Soft X-ray Beamline Scientist

5. AUSTRALIAN SYNCHROTRON IN THE NEWS

In February 2008, several Australian and overseas media outlets, including *The Age* newspaper in Melbourne, reported the announcement of the start of construction of the Imaging and Medical Therapy Centre.

In December 2007, the Australian Synchrotron featured in two television news items. Channel 9 broadcast a story about the Monash Immunology and Stem Cell Laboratory's infrared beamline investigations of early-stage changes in multiple sclerosis. Channel 10 ran a story about the Users Meeting, including interviews with Rob Lamb, Peter Lay (Sydney University) and Phil Heraud (Monash University).

Also in December 2007, Rob Lamb and facility operations director Dean Morris appeared in *The Age Melbourne Magazine's* 2007 Top 100.

Australasian Science is running a series of monthly articles highlighting the unique capabilities of Australian Synchrotron beamlines. The March 2008 issue will feature the powder diffraction beamline.

6. BEAMTIME SUBMISSIONS

ASRP beamtime submissions

The Australian Synchrotron Research Program (ASRP) is now calling for proposals for ASRP beamtime on the Australian National Beamline Facility at the Photon Factory, the ChemMatCARS beamline at the APS, and the XOR beamlines on sectors 1, 2, 4 and 20 at the APS.

This round of beamtime proposals is for the second ASRP cycle of 2008, i.e. April - July for the Photon Factory and May - August for APS beamlines. The round is designated "ASRP_2008/2" on the web portal.

Proposals for these beamlines must be submitted **online** to the synchrotron proposal portal:

<http://prism.nbi.ansto.gov.au/as/proposal/index.jsp>

The deadline for proposals for these ASRP beamlines is **Monday 10 March 2008**.

Australian Synchrotron Beamtime Submissions

The next round of submissions for beamtime at the Australian Synchrotron will open on 11 March 2008 and close on 1 April 2008. This call will be for beamtime between May and August 2008 on the protein crystallography, infrared, powder diffraction and soft x-ray beamlines.

Proposed dates for the rest of 2008 are noted on the Australian Synchrotron website:

http://www.synchrotron.vic.gov.au/content.asp?Document_ID=5305

If you would like to discuss your ideas 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 Cathy Harland, Group Leader, User Support: cathy.harland@synchrotron.org.au

7. FORTHCOMING EVENTS

EVENTS IN AUSTRALIA

International Conference on Nanoscience and Nanotechnology (ICONN 2008)

25-29 February 2008, Melbourne Convention Centre, Melbourne, Victoria

The 2008 International Conference on Nanoscience and Nanotechnology (ICONN 2008) aims to bring together Australian and international students, scientists and engineers from academia, government laboratories and industry working in the field of nanoscale science and technology to discuss new and exciting advances in the field. ICONN 2008 will cover nanostructure growth, synthesis, fabrication, characterisation, device design, modelling, fabrication, testing and applications.

On Monday 25 February, Rob Lamb, David Cookson and three other scientists from the Australian Synchrotron will present a short course entitled 'Applications of the synchrotron to nanoscience and technology'.

<http://www.ausnano.net/ICONN2008>

Accelerator Science School and Workshop

The Australian Synchrotron and the University of Melbourne School of Physics are conducting an accelerator science school and workshop. The school is aimed at university students in physics or related engineering fields, with lectures by Prof Ted Wilson, former head of the CERN Accelerator School. The two-day workshop will give an overview of accelerator science with an emphasis on synchrotron lightsources.

Accelerator science school

Venue: The University of Melbourne

Part I

- 26-28 March Introduction to Particle Accelerators Lectures
- 30 March - Practical Lab at the Australian Synchrotron

Part II

- 31 March-2 April An Overview of Accelerators for Synchrotron Lightsources

Accelerator science workshop

7-8 April 2008

Venue: The University of Melbourne

Invited international keynote speakers include:

- Prof Zhentang Zhao (SSRF) - Commissioning of the Shanghai Synchrotron Radiation Facility
- Jeff Corbett (SLAC) - Review of Synchrotron Light Sources
- Emmanuel Tsesmelis (CERN) - Future Accelerators at CERN.

A tour of the Australian Synchrotron is included on 7 April as part of the workshop. Researchers from physics, engineering and related fields are encouraged to attend with a view to collaborating on future research and development.

Registration and more details available at

<http://www.accel08.synchrotron.org.au>

or contact Mark Boland at

mark.boland@synchrotron.vic.gov.au

EVENTS OUTSIDE AUSTRALIA

For additional information and listings, see:

<http://www.lightsources.org/cms/?pid=1000068>

8th World Biomaterials Congress—2008

28 May–1 June 2008, Amsterdam, The Netherlands

<http://www.wbc2008.com/>

Crossing Frontiers in Biomaterials and Regenerative Medicine

6th International Conference on Synchrotron Radiation in Materials Science (SRMS-6)

20-23 July 2008, Campinas, Brazil

<http://www.srms-6.com.br>

The conference's main topics are archaeological materials, catalysts and clusters, complex oxides, data-storage and engineering materials, films, surfaces and interfaces, geo-physical and electronic materials, glasses and ceramics, liquids, magnetism, materials under extreme conditions (high pressure, etc.), metals and alloys, metamaterials, molecular electronics, multiferroics, nanostructured materials and self-assembly, polymers and biomaterials, photo materials, nanofocus techniques, strongly correlated materials, superconducting materials, industrial use of SR, and instrumentation/recent developments.

Students and post-doctoral fellows may be able to apply for registration waivers.

Deadline for abstract submission is **7 March 2008**.

IUMRS-ICEM 2008: Synchrotron Radiation (Symposium J)

International Conference on Electronic Materials

28 July – 1 August 2008

Hilton Sydney, Sydney, Australia

Precise and potentially non-destructive characterisation of bulk-, micro- and nanostructures is critical for the design and manufacture of contemporary electronic materials. Advances in various x-ray diffraction, absorption and microscopy techniques enable insight into the structure and dynamic behaviour of such materials. Furthermore, recent rapid development of the methods and techniques utilising synchrotron radiation has opened new possibilities for direct and diffractive imaging and in-situ studies of materials at the nanometre scale.

Collaborations between the physical and material sciences have created new methods of imaging of modern materials and nanostructures using conventional and synchrotron x-rays. We hope to bring together scientists of all disciplines who use x-rays to solve their scientific problems, allowing participants to gain a new understanding of, and appreciation for, the role that advanced synchrotron techniques can play in their research.

- Advances in x-ray microscopy techniques and instrumentation
- Novel methods for non-destructive characterisation of materials
- Three-dimensional imaging methods
- Characterisation of interfaces and microstructural defects
- Structure and deformation of nanostructured and thin-film materials
- Advances in theoretical and/or computational imaging

More: <http://www.aumrs.com.au/ICEM-08/Symposia/?S=9>

MORE INFORMATION

A list of Australian Synchrotron Project personnel can be found at http://www.synchrotron.org.au/content.asp?Document_ID=129.

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[Please note that the facility is not open to the public]

City office

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