



Lightspeed
Australian Synchrotron News
October 2008

Come and see the brightest Light in the Southern Hemisphere.

**AUSTRALIAN SYNCHROTRON
OPEN DAY** SUNDAY
26 OCTOBER 2008
10AM TO 4PM

Entry is free but bookings are essential. For more details, visit www.synchrotron.org.au

Australian Synchrotron

FROM THE DIRECTOR: TAKE A WEEK ON THE BRIGHT SIDE

Now that Australia has its very own synchrotron, we have a first-class entry ticket to the international synchrotron circuit that brings both opportunities and responsibilities.



Prof. Robert Lamb

Many of you are already beginning to grasp the opportunities resulting from the increased availability of synchrotron techniques to Australian and New Zealand researchers.

As part of fulfilling our responsibilities to the national and international synchrotron communities, we hold annual meetings to enable synchrotron users to exchange ideas and talk about what they've been doing.

Holding a major synchrotron meeting is quite a challenge because it has the potential to involve every scientific discipline under the sun, not just one or two. The first major Australian synchrotron users meeting was in 2003 and we've held one every year since, but this year it's also our turn to host the Asia-Ocean Forum for Synchrotron Radiation Research (AOF-SRR). The forum is a major regional meeting that will give us an even greater opportunity to attract the international spotlight.

We have arrived on the stage and we're here to stay, thanks to those who have helped us over the years.

Please come and join us in Melbourne in early December for our users meeting and other synchrotron-related events. I guarantee you'll really enjoy the A-O Week experience! 

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**A-O Week
Australian
Synchrotron**
1 - 5 December 2008
Novotel, St Kilda
Melbourne, Australia
REGISTER NOW

CONGRATULATIONS: 1000 USERS!

On 1 October 2008, Audrey Beaussart from the University of South Australia became the Australian Synchrotron's 1000th user when she arrived to use the infrared spectroscopy beamline. More details will appear in November *Lightspeed*. 

BEAMTIME APPLICATIONS OPEN 11 OCTOBER

The next call for submissions for beamtime at the Australian Synchrotron opens on 11 October and closes on 1 November 2008. This call is for beamtime between January and April 2009 and will include protein crystallography, mid-infrared microscopy, far-infrared high-resolution spectroscopy, powder diffraction and soft x-ray spectroscopy.

Key dates for this round (2009/1) are listed at http://www.synchrotron.org.au/content.asp?Document_ID=5305.

All proposals must be submitted through the synchrotron portal, which can be accessed via http://www.synchrotron.org.au/content.asp?Document_ID=5338

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 

GENTLE HEAD OF SCIENCE

Professor Ian Gentle from the University of Queensland has been appointed Head of Science at the Australian Synchrotron

An experienced user of synchrotron x-ray techniques and neutron beam techniques, Ian is well-known within the Australian and international synchrotron user communities. He is currently an Associate Professor in the School of Molecular and Microbial Sciences and Deputy Director of the Centre for Microscopy and Microanalysis at the University of Queensland.

In his new position at the Australian Synchrotron, Ian will play a leading role in developing and pursuing the synchrotron's strategic directions and fostering effective scientific collaborations. He will work closely with the synchrotron's director, head of beamline development and other senior managers.

Ian also plans to use the synchrotron to further his own research into the properties of interfaces, i.e. the regions between two phases such as solid and liquid. Areas of interest include looking at how cell membrane proteins could help improve the effectiveness of drugs for acne and other skin diseases, the role of proteins in lung surfactants, and the development and synchrotron analysis of highly ordered organic films as thin as a single molecular layer.

"My objective is to ensure that this versatile and powerful new research tool is used effectively, by facilitating awareness and availability for all users and potential users in the scientific community," Ian told *Lightspeed*. "I am also keen to foster a dynamic research culture amongst the scientific staff of the synchrotron." 

UP TO SPEED

This month our short interview features Mark Clift, senior control systems engineer at the Australian Synchrotron since 2003.



Describe your job in 25 words or less.

I construct hardware and software for the motor systems that control the movement of wiggler and

undulator magnets and beamline endstation components.

Best aspect of your job?

I love the fact that I work with such a wide variety of technologies.

Worst aspect of your job?

The work here is so cerebral that you don't have the mental capacity to address the social side of work. I miss working with people.

Apart from the Australian Synchrotron, what's the coolest job you've ever had?

Making telemetry rigs and software to translate puppeteers' movements into puppet actions on a children's television show. I've also mustered beef cattle in Gippsland and made detection systems for cancer research at Peter MacCallum Cancer Centre.

Best things about living in Melbourne, and why?

The people are friendly, there's good wining and dining to reflect a variety of cultures, and you don't have to travel very far to go surfing or up to the snow.

A little-known fact about the Australian Synchrotron?

The EPICS control system software we use was originally designed for former US president Ronald Reagan's strategic defence initiative, also known as the star wars program.



YOU AND ME AND THE LHC

Here's a good question for your next trivia night. What's the difference between the Australian Synchrotron in Melbourne and the Large Hadron Collider near Geneva?

Stumped? Here's the answer, from Australian Synchrotron accelerator physicist Rohan Dowd.

Well, both are synchrotrons, but built for very different purposes. Strictly speaking, a synchrotron is a circular particle accelerator that uses magnetic and electric fields to accelerate charged particles. Both the Australian Synchrotron and the LHC use synchrotrons to accelerate charged particles – it's what happens next that makes the big difference.

At the Australian Synchrotron, we accelerate a single beam of electrons to 3 GeV energy (giga-electron volts) and place them in a storage ring. The electrons circulating in the storage ring give off synchrotron radiation, which is harnessed for beamline experiments in biological, chemical and materials science.

At the Large Hadron Collider (LHC), physicists are interested in creating extremely high energy particle collisions to study the fundamental forces of the universe. In the LHC storage ring, two proton beams circulating in opposite directions are ramped up to 7 TeV (tera-electron volts) and focused into four collision points.

Despite differences in scale and purpose, both facilities rely on electromagnets, RF (radiofrequency) systems, beam diagnostic instruments and accelerator physics techniques.



Physics underground: the tunnel that houses the LHC near Geneva is 27 kilometres long. Senior managers at the Australian Synchrotron have denied rumours that they plan to introduce unicycles and skateboards to transport staff around the storage ring at the Melbourne facility

Full article on Australian Synchrotron website:

http://www.synchrotron.org.au/content.asp?Document_ID=5467

Link to CERN website: <http://public.web.cern.ch/public/en/LHC/LHC-en.html>



AUSTRALIAN SYNCHROTRON THESIS MEDAL

Recent PhD graduates are invited to submit applications for the 2008 Australian Synchrotron Thesis Medal

The Medal continues the tradition established by the Australian Synchrotron Research Program (ASRP). It is awarded annually to the PhD student judged to have completed, under the auspices of an Australian or New Zealand university, the most outstanding thesis using and acknowledging a synchrotron

EVENTS DIARY

EVENTS IN AUSTRALIA

OPEN DAY

**26 October 2008,
Australian Synchrotron**

The Australian Synchrotron open day is a once-a-year opportunity to see inside the synchrotron. Entry and parking are free, but participants need to register online. More details available from www.synchrotron.org.au.

A-O Week of the Australian Synchrotron



Australian Synchrotron
lighting the path to innovation

1-5 December
2008
Australia plays
host to
researchers from
the Asia-Oceania

region at The A-O Week of the Australian Synchrotron from 1 to 5 December. The week features a series of important events beginning with a meeting of the Science Advisory Committee (SAC) planned for 1 December. This is followed by the Australian Synchrotron Users Meeting on 2-3 December and the third Asia-Oceania Forum for Synchrotron Radiation Research (AOFSSRR) on 4-5 December. Satellite activities include the Next Generation Science Workshop on 4 December

*Abstract submissions close Friday 24
October 2008*

*Discount available for student
registrations*

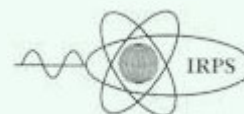
More details available at

<http://www.asnevents.com.au/synchrotron08/>

11th International Symposium on Radiation Physics (ISRP-11)

21-25 September 2009

The University of Melbourne, Australia



ISRP-11 is organised by the International Radiation Physics Society (IRPS) and is supported by DEST, the Australian Synchrotron and the Victorian Government. The meeting is

facility anywhere in the world.

The broad scientific field from which candidates can apply alternates between the life sciences and the physical/chemical sciences.

For 2008, the Medal will be awarded to the most outstanding candidate from the life sciences. The winner will be announced in early December at the 2008 Synchrotron Users Meeting, which is part of this year's A-O Week in Melbourne.

More: http://www.synchrotron.org.au/content.asp?Document_ID=5461

STUDENTS TAKE A CLOSER LOOK AT THE SYNCHROTRON

In August 2008, two groups of Victorian students travelled to the Australian Synchrotron while another group from Western Australia took part in a virtual visit involving a video link.

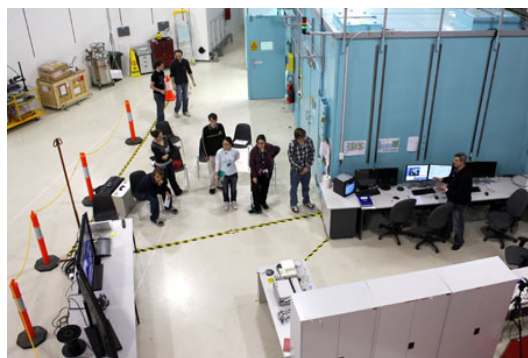
Sixteen medical chemistry students from Victoria University's Werribee campus visited the Australian Synchrotron with their lecturer, Prof. John Orbell. The third-year students were particularly interested in the imaging and medical therapy beamline because their course covers a range of medical imaging processes, including magnetic resonance imaging, nuclear medicine and positron emission tomography. One of the students is already planning to take part in a synchrotron research project next year, and others are expected to follow suit.

Curtin University students engaged in a visit of another kind when Prof. Roland De Marco, from the university's Department of Applied Chemistry, conducted a

lecture from the Australian Synchrotron while third-year and fourth-year students watched from Perth via a live broadband link. The broadband link was set up by Victorian eResearch Strategic Initiative (VERSI) staff. A number of



Victoria University students in front of the soft x-ray beamline with their lecturer, John Orbell (RHS).



Roland De Marco (RHS) lectures to university chemistry students in Melbourne and Perth simultaneously, live from the Australian Synchrotron.

electrode. Roland's aim is to develop better surface coatings to prevent corrosion of pipelines such as those that transport oil and gas from the North West Shelf development off the coast of Western Australia.

devoted to current trends in radiation physics research.

More:

<http://mcmconferences.com/isrp11>

10th International Conference on Synchrotron Radiation and Instrumentation 2009 (SRI2009)

Melbourne Convention & Exhibition Centre

28 September – 2 October 2009



The world's largest and most important forum for synchrotron radiation science and technology communities, SRI is expected to attract 800 international and Australian delegates in 2009. The conference promotes international exchange and collaboration among scientists and engineers involved in developing new concepts, techniques and instruments related to the production and utilisation of synchrotron radiation.

More details are available at

<http://www.sri09.org/>

EVENTS OUTSIDE AUSTRALIA

For additional information and listings, see

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

Biological Physics at Large Facilities: From Molecule to Cell

19 - 23 October 2008, Grenoble, France

Jointly organised by the European Synchrotron Radiation Facility (ESRF) and Institut Laue-Langevin (ILL).

Workshop participants will discuss physics instrumentation and methods for the study of biological structures and dynamics at neutron sources and synchrotron radiation facilities. Both

SCIENCE PRIZE FOR YOUNG SYNCHROTRON USER

One of the four 2008 Women in Science Fellowships sponsored by L'Oréal Australia has been awarded to a synchrotron user.

Dr Natalie Borg, a research fellow in the Department of Biochemistry and Molecular Biology at Monash University, is studying key steps in the body's early warning system for detecting and responding to viral attacks.

She uses synchrotron techniques, including protein crystallography at the Australian Synchrotron, to investigate how proteins work together to trigger the body's immune system. Her current focus is to understand how our body is able to defend itself against viruses like Hepatitis C, influenza A and measles. This defence mechanism involves many protein messengers that must communicate with one another to produce an anti-viral immune response. Natalie aims to study the structure and function of a largely uncharacterised protein involved in this process.

In 2007, while working with Jamie Rossjohn at Monash University, Natalie co-authored an article published in the prestigious science journal, *Nature*, based partly on data collected at a US synchrotron. The article revealed how a part of the body's defence system known as 'natural killer T (NKT) cells' recognises glycolipids, a kind of fat that can signal the presence of certain bacteria and some kinds of cancer cells,

Natalie plans to use her \$20,000 fellowship from L'Oréal to conduct preliminary experiments that will enable her to apply for funding to help set up her own research group. 

IT'S A DOG'S LIFE

Synchrotron scientists aren't the only ones obsessed with high-speed objects that go round in circles.

Local resident Jessie, a border collie, visits a nearby park twice a day to play with her beloved synchrotron Frisbee.

Owner David says Jessie refuses to play with tennis balls, sticks or anything else he has tried. She only wants to play with Frisbees that have a large hole in the middle.

"Jessie's fascination with Frisbees was born after our trip to the opening of the synchrotron," says David. "She delights in catching them and retrieving them, but never chews them. She really cherishes them."



Jessie with her beloved Australian Synchrotron Frisbee 

This document is online at: http://www.synchrotron.org.au/content.asp?Document_ID=5471

ESRF and ILL are planning considerable upgrades, with biophysical methods at the forefront, and the workshop will provide input to these plans as well as opportunities for networking.

More: <http://www.ill.eu/news-events/workshops-events/biological-physics-at-large-facilities/>

BioCARS Workshop on Time-resolved Macromolecular Crystallography

20-22 Nov 2008, APS, Chicago, US

This workshop will provide hands-on training in designing and conducting time-resolved experiments and in Laue data processing and analysis.

Participants will also learn about recent upgrades to BioCARS insertion device beamline 14-ID X-ray and laser facilities.

More: <http://cars.uchicago.edu/biocars>

Further information:

Vukica Srajer v-srajer@uchicago.edu

or Jane Andrew

andrew@cars.uchicago.edu

High Pressure Molecular Biophysics Conference (HPMB2008)

10-12 December 2008

SOLEIL, Saint Aubin, France



Jointly organised by SOLEIL, Centre de Biophysique Moléculaire (CBM, Orléans) and Institut de Biologie Structurale (IBS, Grenoble), this multidisciplinary conference will highlight:

- interests and prospects of combining high-pressure perturbation and various biophysical tools, including high resolution structural methods (NMR and macromolecular crystallography)
- scientific results in the field
- recent instrumental advances
- interplay between experiments and simulations.

More: <http://www.synchrotron-soleil.fr/portal/page/portal/Soleil/ToutesActualites/Workshops/2008/HPMB2008> or email: conf-hpmb2008@synchrotron-soleil.fr

BEAMLINE FOCUS

Soft X-ray Spectroscopy Beamline

The soft x-ray beamline and endstation facilities are operating smoothly, with the team making some minor adjustments to improve performance.

Various sample holders can be made available for drain current NEXAFS measurements, single crystal cleaving, high-temperature and ultra-high temperature applications. The partial electron yield (PEY) detector is being brought back into operation to complement total electron yield detection. The PEY detector can also be run in a mode to give total fluorescence yield detection.

If you would like to use a specific-purpose sample holder, please discuss your requirements with beamline staff well in advance of your arrival.

For up-to-date information on equipment available to users, send an email to bruce.cowie@synchrotron.org.au

Bruce Cowie, Principal Scientist, Soft X-ray Spectroscopy 

RAPID ACCESS ON TRIAL

Rapid access to the high-throughput protein crystallography beamline at the Australian Synchrotron will be trialled again on 7-8 November and 11-12 December 2008.

The main aim of the new system, which was trialled for the first time on 8-9 October, is to provide rapid beamline access for experienced users with high profile, highly competitive projects. Assessment criteria for Mode 1 Rapid Access will include, for example, publishing prospects, intellectual property considerations, and evidence of strong competition by other groups. Proposals must be lodged at least three weeks in advance of the shift being sought, and will be considered on a first-come first-served basis.

The rapid access system also aims to provide more immediate access for users who have already had proposals accepted for that round but want to investigate additional crystals. Mode 2 Rapid Access time will only become available if Mode 1 proposals have not filled all the rapid access timeslots.

More at http://www.synchrotron.org.au/content.asp?Document_ID=5448 

NEW SURVEY TO BOOST USER SATISFACTION

A new online survey has been developed to help users provide feedback to the Australian Synchrotron.

All users are required to complete the new survey, even if they have already provided feedback. Future beamtime allocations may be contingent on completion of the survey.

The online survey takes around 15 minutes to complete, and is available via the User Information section on the Australian Synchrotron website.

Survey: http://www.synchrotron.org.au/content.asp?Document_ID=5450 

Synchrotron Environmental Science IV

11-13 December 2008

San Francisco, California, USA

The SESIV meeting will consider emerging frontiers in environmental science and the role synchrotron science can play in solving our global environmental problems. Environmental science researchers new to synchrotron radiation are encouraged to attend.

Deadline for poster abstracts and travel support requests:
15 October 2008.

Early registration deadline:
14 November 2008

More:

<http://esd.lbl.gov/sesIV08/index.html>

X-RAY SCIENCE, GORDON RESEARCH CONFERENCE MEETING

2-7 August 2009

Colby College, Waterville, Maine, USA

Topics currently under consideration for this meeting include:

- science frontiers using new x-ray sources
- x-ray scattering /spectroscopy under extreme conditions
- use of coherent x-rays for imaging and studies of dynamics
- x-rays in biology, life, energy and environment science
- dynamics by pump and probe technique
- inelastic x-ray scattering
- new techniques / optics, detectors and others.

The Conference Chairman is Jun'ichiro Mizuki (mizuki@spring8.or.jp), Deputy Director General, Quantum Beam Science Directorate, Japan Atomic Energy Agency (JAEA).

The Vice Chair is Brian Stephenson (stephenson@anl.gov), ANL.



A SYNCHROTRON BY ANY OTHER NAME

As noted previously in Lightspeed, we are looking for a new name to use as a nickname or pet name for the Australian Synchrotron. Suggestions must be received by 31 October 2008.

Many synchrotrons around the world have short names derived from light source terminology. For example, the Berliner Elektronenspeicherring-Gesellschaft für Synchrotronstrahlung in Germany is known simply as BESSY. The French national synchrotron facility is Soleil. The Sincrotrone Trieste in Italy is Elettra. Japan's 8 GeV synchrotron photon ring is SPring-8.

For the Australian Synchrotron, we would like a pet name that is quintessentially Australian in character, easy to remember and not too long.

We invite all members of the synchrotron community and interested onlookers to submit their suggestions by email to info@synchrotron.org.au by 31 October 2008. The entries will be peer-reviewed and a short list of suitable names will be selected and submitted to the Australian Synchrotron Board to make a final decision. The chosen name will be announced at the 2008 User Meeting in Melbourne in early December 2008. 

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:

http://www.synchrotron.org.au/content.asp?Document_ID=14.



MORE INFORMATION

A list of Australian Synchrotron personnel can be found here:

http://www.synchrotron.org.au/content.asp?Document_ID=129.

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