

Lightspeed

Australian Synchrotron News
September 2009

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Australian Synchrotron

THE AUSTRALIAN SYNCHROTRON IS PROUD TO HOST

SRI09 | 27 SEPTEMBER TO 2 OCTOBER 2009

THE 10th INTERNATIONAL CONFERENCE ON SYNCHROTRON RADIATION INSTRUMENTATION
AT THE MELBOURNE CONVENTION AND EXHIBITION CENTRE

Australian Government
Department of Innovation, Industry, Science and Research
This conference is supported by the Commonwealth of Australia under the International Science Exchange program.

State Government
Victoria
AUSTRALIA

FROM THE DIRECTOR: IT'S SHOWTIME!

September in Melbourne is traditionally a big month for grand occasions and celebrations with the Royal Agricultural Show and the nation's beloved Aussie Rules football grand final.


But this year there's more.

This year Melbourne is also hosting the world's largest synchrotron conference: SRI 2009. And I'm proud to say that despite the additional time and money it takes to travel from Europe and North America to Australia, the international synchrotron community has clearly voted with its collective feet.



Prof. Robert Lamb outside the Australian Synchrotron

By early September, more than 600 delegates from around the world had signed up to attend, along with 13 of the world's 26 synchrotron directors. We expect more than 700 delegates to attend the official opening plenary session on Monday 28 September. Countries whose synchrotron scientists are turning out in force include Japan, USA, Germany, France, China, Taiwan, UK, Switzerland and South Korea.

Now it's our turn: time for us to show the world what Australian science can do. If you live in Australia and have an interest in synchrotrons, I want to see you at SRI 2009. I guarantee you'll see the best of what the international synchrotron community can offer! 

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'BOOSTER BROCCOLI' FUELS TRANS-TASMAN SCIENTIFIC SUCCESS

Trans-Tasman scientific collaboration, as represented by Booster Broccoli™, has been celebrated at the Australian Synchrotron with the visit of the Prime Minister of New Zealand, the Honourable John Key and Victorian Minister for Innovation Gavin Jennings.

John Key spoke glowingly of the trans-Tasman scientific relationship, stressing that the Australian Synchrotron represents a critical mass of scientific infrastructure that New Zealand would be unable to sustain by itself. The easy proximity of the synchrotron in Melbourne is therefore a great boon for both countries and a welcome new offshoot of the ANZAC tradition.

Gavin Jennings said the outcomes of innovative scientific collaborations would deliver tangible health benefits to families in Australia and New Zealand - and ultimately to people around the world. He added that it would help vegetable growers in Australia become more competitive in the global market.

Booster Broccoli™, a non-GM plant variety developed to deliver improved health and nutritional benefits, is already available to consumers. Further research now underway aims to enhance selenium by regulated feeding through the plant's root system and foliage.

The Chairman of the Australian Synchrotron Board, Catherine Walter, praised the foresight, commitment and strategic approach of governments, research institutions, funding bodies and the scientific community, without which the synchrotron and all its benefits would never have come to fruition.

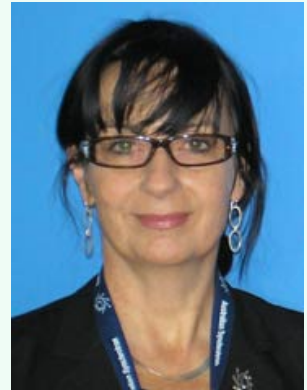


New Zealand Prime Minister John Key (left) persuades synchrotron director Rob Lamb to try a broccoli boost



UP TO SPEED

This month our short interview features Anne Ridgway, head of human resources management at the Australian Synchrotron.



Describe your job in 25 words or less.

I devise strategies to help create the best possible work environment and conditions for employees, so they can contribute to achieving the synchrotron's goals.

Best aspect of your job?

I can't just list one best aspect. Working with people across the organisation – scientists, engineers, corporate – and understanding their goals and contributions. Seeing how enthusiastic job candidates are about the prospect of joining us. Also my new office, where people can come to talk.

Worst aspect of your job?

I prefer to think of these as challenges, such as having to deal with highly complex issues that can deeply affect people.

Best things about living in Melbourne and why?

Living close to Mornington Peninsula wineries, beaches and ocean views while still having good access to the synchrotron and the city.

Your favourite overseas destination and why?

Sipidan, an island in northern Borneo. It's one of the world's top scuba diving locations with turtles, hammerhead sharks, rays, corals and myriads of colourful fish.



HOW DO IONS MAKE TRACKS?

Like lion tracks, you could probably find them on the vast plains of southern Africa if you knew how to look for them. Unlike their big game counterpart, however, ion tracks tend to attract physicists rather than wildlife photographers.

Ion tracks are the almost undetectable trails left by high-velocity heavy ions ('swift heavy ions') such as uranium and gold when they pass through materials such as silica (SiO_2).

Patrick Kluth from the Australian National University says ion tracks have many different applications, particularly in materials science and engineering, geology and physics research. For example, they are useful for dating ancient geological samples and archaeological artefacts, testing storage materials for immobilising nuclear waste, protecting aerospace equipment from damage in interplanetary space, and developing new nanofabrication techniques.

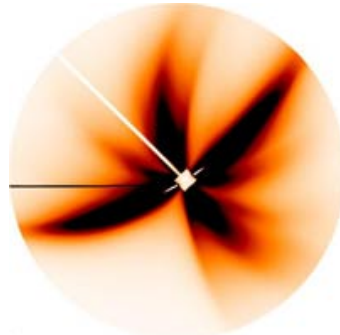
High-energy ions rarely collide with atomic nuclei on their way through a material but they lose energy in very brief encounters with electrons, creating ion tracks that are only a few nanometres wide but can be hundreds of micrometres long. However, the mechanisms of ion track formation are not fully understood.

Patrick and his colleagues are using small angle x-ray scattering (SAXS) at the Australian Synchrotron to investigate the formation of ion tracks. Patrick's interest in ion tracks stems from his background in nanofabrication. Ion tracks can be used as templates for producing rows of nanowires, or as single pores for filtering or sensing particular biological molecules.

"SAXS can yield information about local density in ion tracks that we can't get from any other technique," Patrick told *Lightspeed*. "Our synchrotron measurements have yielded new insights into the structure of ion tracks in several materials including amorphous SiO_2 ."

More:

<http://www.synchrotron.org.au/index.php/aussyncbeamlines/saxswaxs/how-do-ions-make-tracks> 



This artistic image was created using SAXS (small angle x-ray scattering) data obtained from studies of the ion tracks left behind by gold passing through lithium fluoride (LiF).
Image: Patrick Kluth, ANU.



Patrick Kluth and ANU colleagues with the SAXS beamline team on 13 August 2009, 12 months to the day since the beamline achieved first light. L to R: Adrian Hawley (AS), Stephen Mudie (AS), Patrick Kluth (ANU), Nigel Kirby (AS), Boshra Afra (ANU) and Matias Rodriguez (ANU).

BEAMTIME APPLICATIONS OPENING SOON

Beamtime submissions for the 2010/1 round (January – May 2010) will open on 10 September and close on 5 October 2009.

Key dates for beamtime submissions are listed on the new synchrotron website here: <http://www.synchrotron.org.au/index.php/features/applying-for-beamtime/2009-2010-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



AUSTRALIAN SYNCHROTRON DEVELOPMENT PLAN

Over the last month, the synchrotron's Head of Science, Prof Ian Gentle and his colleague Dr Garry Foran have presented workshops around Australia and New Zealand for the purpose of widely consulting current and potential synchrotron users about their future synchrotron needs.

"Our intention is to have a community-led and open process to ensure that the outcome is the most effective combination of projects to ensure that the facility continues to meet the growing demands of the Australasian synchrotron community," Ian said.

The ultimate outcome will be the Australian Synchrotron Development Plan (ASDP), a roadmap for the construction of the next group of beamlines, enhancements to current beamlines and the machine and increased capabilities for Australia's largest scientific user facility.

The Australian Synchrotron is compiling a list of the exciting projects already proposed. This will be made

SYNCHROTRON GETS INTO TARDIS

Synchrotrons have changed the face of protein crystallography and drug development; the downside is the vast quantities of x-ray diffraction data that must be stored for future use.

Like its Dr Who counterpart – much roomier inside than its exterior suggests, the TARDIS project coordinated by Monash University Associate Professor Ashley Buckle aims to comfortably accommodate these data and improve their availability.

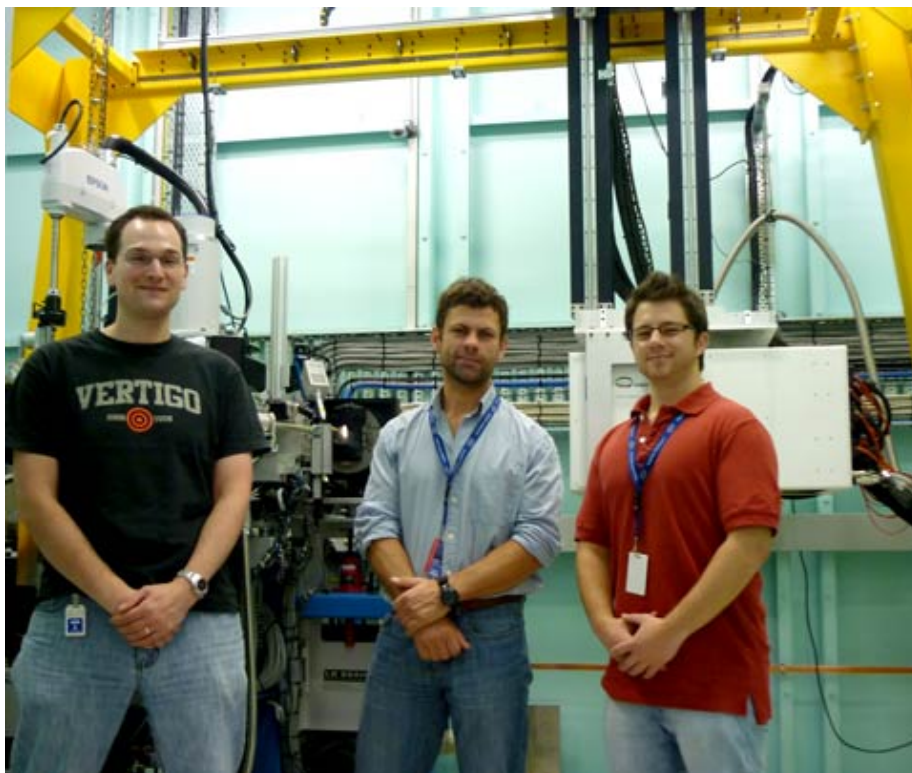
TARDIS is a multi-institutional collaborative venture that aims to facilitate archiving and sharing of raw x-ray diffraction images from protein crystallography. While coordinates and processed data are stored in the Worldwide Protein Data Bank, the raw diffraction data are often unavailable.

“TARDIS already contains quite a bit of data collected at the Australian Synchrotron and we expect that will grow rapidly,” Ashley says.

“We are also working on MyTARDIS, a portal for individuals and their data to enable researchers collecting data at PX1 or PX2 to immediately annotate and deposit their data into a safe data store. Our aim is to streamline the process and manage the data as soon as it comes off the detector.”

In the longer term, TARDIS will feed into a larger informatic pipeline that aims to manage and “glue together” data from all stages of structural biology: from DNA cloning through protein expression and crystallisation to x-ray data collection, structure solution and analysis.

More information: www.tardis.edu.au



L-R: Tom Caradoc-Davies (AS) with Ashley Buckle and developer Steve Androulakis.

available on the AS website and regularly updated. The final selection of priorities will be announced early in 2010.

More information on the ASDP can be found here:
<http://www.synchrotron.org.au/index.php/about-us/australian-synchrotron-development-plan>

To submit a project for consideration, email your intentions to Garry Foran and Ian Gentle at asdp@synchrotron.org.au

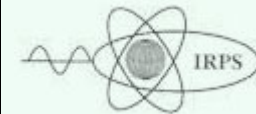


EVENTS DIARY

EVENTS IN AUSTRALIA

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 devoted to current trends in radiation physics research.

More: mcmconferences.com/isrp11

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

Melbourne Convention & Exhibition Centre
28 September – 2 October 2009



CONFERENCE ADVANCES INTERNATIONAL RELATIONS

The 5th International Conference on Advanced Vibrational Spectroscopy (ICAVS) held recently in Melbourne was hosted by Monash University and part-sponsored by the AS.

The program included a well-attended synchrotron workshop with three overseas speakers. Paul Dumas (Soleil synchrotron, Paris) gave an overview of applications of synchrotron radiation in infrared science, Lisa Vaccari (Elettra synchrotron, Trieste) presented her latest research into immunomodulatory proteins in cells using the Elettra IR beamline, and Bob McKellar (National Research Council, Canada) described the Canadian Light Source's high-resolution far-IR program.

Australian presenters were Phil Heraud (Monash Stem Cell Laboratories), Robert Falconer (University of Queensland) and Keith Bambery (Monash). Dominique Appadoo and Mark Tobin presented updates on the Australian Synchrotron's IR beamline.



L-R: Paul Dumas (Soleil), Dominique Appadoo (AS), Lisa Vaccari (Elettra), Ljiljana Puskar (AS), Mark Tobin (AS) and Bob McKellar (NRC) at the ICAVS conference dinner. Photo: Dr Koman Tam



GNOME NEWS IS GOOD NEWS

Lightspeed recently secured an exclusive interview with Harry Vederci, who heads the Australian Synchrotron's Garden West gnome team. Harry and his team are the synchrotron's silent achievers, working long hours at short notice to ensure that the garden landscape is pleasing to the eye of high-level visitors.

How will your recent overseas trip influence your work at the synchrotron?

I have realised that my team is capable of great achievements, even in my absence. From now on, my associate Justin Case will be given more

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 www.sri09.org/

Imaging and Medical Instrumentation conference

3 October 2009

Monash University Centre for Synchrotron Science, Melbourne

Satellite meeting to SRI 2009. Sessions will cover imaging detectors, dosimetry and safety, optics for high-energy x-rays, beamline instrumentation and insertion devices, and data management and processing.

More:

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

Accelerator Physics 'Top-up' Workshop

7-9 October 2009 Melbourne

The Accelerator Physics Group at the Australian Synchrotron is holding an open workshop on top-up operations at synchrotron light sources. The workshop will include presentations and discussions on the accelerator physics and operational aspects of running an electron storage ring in top-up mode.

More:

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

BSR/MASR 2010

15-18 February 2010

Melbourne Convention and Exhibition Centre

BSR 2010 session themes include protein structure and function, biomaterials, spectroscopic techniques and non-crystalline diffraction.

More: www.bsr2010.org

responsibilities, especially in regard to Travel Plan Approvals.

As a longstanding and short-statured staff member, what advice would you offer in regard to ensuring the synchrotron's future success?

While our scientists make us proud, they often stand long and lonely hours at nights, like us gnomes. Perhaps we could treat them more like gnomes. Provided they meet agreed objectives, my gnomes are free to choose their work hours and spend time exploring their territories. I can also recommend overseas travel.

If you could change one thing about the AS, what would it be?

I dream of relocating the synchrotron closer to a country township, away from busy traffic. More realistically, a vegie garden would promote positive interaction between gnomes and humans.

Editor's note: In keeping with equal opportunity principles, *Lightspeed* had also hoped to interview Harry's colleague, Anne. However, we have been reliably informed that Gnome Anne is in Ireland.



Harry Vederici (LH) and team outside the Australian Synchrotron



BEAMLINE FOCUS

Happy Birthday to Three

In August 2009, three Australian Synchrotron beamlines celebrated 12 months of operations since achieving first light: PX2 (protein micro-crystal and small molecule x-ray diffraction) and SAXS (small angle x-ray scattering) on 13 August 2008 and XFM (x-ray fluorescence microprobe aka microspectroscopy beamline) on 14 August 2008.

Speed Meet a Geek

Justin Kimpton from the powder diffraction beamline team recently enjoyed a series of close encounters with the general public when he participated in 'Speed Meet a Geek' at Melbourne's Federation Square.



Justin Kimpton (light blue shirt) waxes lyrical on the finer points of synchrotron life at 'Speed Meet a Geek'

MASR 2010 session themes include x-ray imaging, radiology, dosimetry and radiation biology, oncology, and pathology and diagnostics.

More: www.masr2010.org

Early bird and abstract deadline is 27 November 2009. Sponsored by Monash University Centre for Synchrotron Science and CSIRO.

EVENTS OUTSIDE AUSTRALIA

For additional information and listings, see

www.lightsources.org/cms/?pid=1000068

VUVX2010

11-16 July 2010

University of British Columbia
Vancouver, British Columbia, Canada

The 37th International Conference on Vacuum Ultraviolet and X-ray Physics will cover the development of synchrotron, laser, or plasma based sources of electromagnetic radiation in the vacuum ultraviolet (VUV), soft X-ray and hard X-ray regions, and novel applications of these sources in a variety of fields.

More: <http://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 is jointly organised by Northwestern University and Argonne National Laboratory. This biennial event 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:

<http://www.sxns11.northwestern.edu/>



Part of National Science Week, the event was promoted as “a chance to get up close and personal” with “some of Melbourne’s most charming scientists” and “find out about their work, their interests, their life and their secrets”.

Justin said “it was a very enjoyable evening and a great opportunity to describe to people the wonderful work we do here at the Australian Synchrotron”.



READER FEEDBACK

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



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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/index.php/about-us/working-at-the-synchrotron/employment-opportunities>





MORE INFORMATION

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

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