



Femtosecond Laser Facility Officially Opened at Swinburne

The CXS Femtosecond Laser Facility at Swinburne University was officially opened by Mr Gavin Jennings MLC, Victorian Minister for Innovation

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Coming Events

Detector Workshop - Detectors for

Coherent X-ray Diffractive Imaging:

Monash University, Lecture Theatre S8,
Friday 2nd May 2008.

3rd CXS Annual Workshop 2008:

Physicists and Biologists Working

Together

Bio21 Melbourne, Australia

September 17 - 19th

FEATURES INCLUDE

- Site tour of the Australian Synchrotron
- Poster and oral presentations of recent research
- Workshop dinner

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INFORMATION OR VISIT:

[HTTP://131.172.132.43/CXS/](http://131.172.132.43/CXS/)



Mr Gavin Jennings MLC and Professor Keith Nugent at the Official Opening of the Laser Facility

CXS celebrated the installation of the Femtosecond High Power Laser Facility at Swinburne University of Technology Hawthorn campus on November 27th 2007.

The Victorian Minister for Innovation Mr Gavin Jennings MLC, officially declared the facility open and unveiled a plaque to mark the occasion.

Joining Mr Jennings on the presentation stage were CXS Director Professor Keith Nugent; Pro-Vice Chancellor of Swinburne University Professor Andrew Flitman and spokesperson for the CXS Short Wavelength Laser Source Program Professor Peter Hannaford.

After the ceremony the 80+ guests took part in a tour of the Femtosecond High Power Laser Facility then enjoyed a champagne lunch.

“The Femtosecond High Power Laser Facility will enable revolutionary ideas in laser science to be used to address problems in biophysics, “ Professor Nugent advised the media.

“The unique properties of the light produced by this laser will also present opportunities for new applications in atomic and molecular spectroscopy, condensed matter physics, nano and sub-nano scale imaging, and plasma physics.”

Enquiries regarding the Femtosecond High Power Laser Facility can be made by phoning 9214 5151 or by email to: cxsenquiries@ph.unimelb.edu.au



The Hon Gavin Jennings unveils the plaque

In Brief

Publications:

Publications for this quarter include:

Hanssen, E., Sougrat, R., Frankland, S., Deed, S., Klonis, N., Lippincott-Schwartz, J. and Tilley, L. *Electron tomography of the Maurer's cleft organelles of Plasmodium falciparum-infected erythrocytes reveals novel structural features*. Molecular Microbiology 67 (4), 703-718 (SCI: 5.634) (2008) (COVER)

K. D. Vora, B. Y. Shew, E. C. Harvey, J. P. Hayes, A. G. Peele, *Sidewall slopes of SU-8 HARMST using deep x-ray lithography*, J. Micromech. Microeng. 18, 035037 (2008)

K. D. Vora, B. Y. Shew, B. Lochel, E. C. Harvey, J. P. Hayes, A. G. Peele, *Sidewall slopes and roughness of SU-8 HARMST*, Microsyst. Technol. DOI 10.1007/s00542-007-0506-y (2008)

J A Davis, L V Dao, X M Wen, C Ticknor, P Hannaford, V A Coleman, H H Tan, C Jagadish, K Koike, S Sasa, M Inoue, M Yano, *Suppression of the internal electrical field effects in ZnO/Zn_{0.7}Mg_{0.3} quantum wells by ion-implantation induced intermixing*, Nanotechnology 19, 055205 (2008)

T.A. Smith, A.J. Trevitt, P.J. Wearne, E.J. Bieske, L.J. McKimmie and D.K. Bird, *Morphology Dependent Resonance Emission from Individual Micron-Sized Particles*, Springer Series on Fluorescence: Fluorescence of Supermolecules, Polymers, and Nanosystems, vol. 4, M.N. Berberan-Santos (Ed.) 2008, XVIII, 468 ISBN: 978-3-540-73927-2, pp 415-429, (2007 on-line version: <http://www.springerlink.com/content/978-3-540-73927-2>)

Crespo, M., Avery, T.D., Hanssen, E., Fox, E., Robinson, T.V., Valente, P., Taylor, D.K. and Tilley, L. *Artemisinin and a series of novel endoperoxide antimalarials exert early effects on digestive vacuole integrity*. Antimicrobial Agents and Chemotherapy 52, 98-109. (SCI: 4.38) (2008)

Tilley, L., Sougrat, R. Lithgow, T. and Hanssen, E. *The twists and turns of Maurer's cleft trafficking in P. falciparum-infected erythrocytes*. Traffic 9(2):187-97 (SCI: 6.612) (2008)

CXS Visitors:

Dr. D. Kielpinski of Griffith University visited Swinburne University of Technology in February 2008

Prof. T. Wilson of Oxford University visited Swinburne University of Technology in February 2008

Kate Souslova, a PG student from Dmitry Chudakov's lab Department of Molecular Biology, Biological Faculty, Moscow State University (MSU), Moscow, Russia will be working with Nick Klonis at La Trobe University until late April 2008

Vassilios Sarafis from Israel is visiting the University of Melbourne to do phase imaging experiments until April 2008

Conferences & Workshops:

The 2nd Advanced Optical Imaging Workshop was held at The University of Melbourne in November 2007. This workshop was organised by A/Prof Trevor Smith and was attended by numerous national and international visitors

Benedicta Arhatari gave a presentation at the Tomography Workshop, December 2007, Canberra, ACT

Andrew Peele was invited to the Ideas Factory on Tomographic Image Reconstruction and Analysis Workshop, Manchester, UK, held January 2008

Garth Williams and Mark Pfeifer presented papers at Université Paul Cezanne, Marseille 12 December 2007

Keith Nugent was an invited lecturer at the 2nd Asia-Oceania Forum for Synchrotron Radiation Research, November 2007

Lap Van Dao and Trevor Smith were invited speakers at the 5th Asian Conference on Ultrafast Phenomena, 7-9 January 2008

The Ultra Cold Plasma Source Program attended and presented three posters at the OSA conference, Quantum-Atom-Optics Downunder, Wollongong

Mike Ryan presented talks at the following universities in Malaysia:

- University Malaya
- Universiti Sains Islam Malaysia
- Universiti Kebangsaan Malaysia
- Universiti Putra Malaysia
- Universiti Sains Malaysia

Welcoming New Members:

Welcome to the following new members to CXS:

Fabienne Perani, Prof Tilley's Personal Assistant and CXS Administration Officer at La Trobe University

Lynn Liang, CXS PhD student based at CSIRO and working with La Trobe University

Mark Junker from Rice (Houston, TX, USA), appointed as a new Postdoc for the Ultra Cold Plasma Source Program will start in early April 2008

Distinctions:

Congratulations to Prof Leann Tilley who was appointed Associate Dean Research at La Trobe University. Leann will commence her new role in April 2008

Congratulations to Prof Keith Nugent for being chosen to by the Australian Research Council to address the inaugural Graeme Clark Research Outcomes Forum and feature in the companion outcomes coffee table book

Congratulations to Kaushal Vora, whose paper: *K. D. Vora, B. Y. Shew, E. C. Harvey, J. P. Hayes, A. G. Peele, Sidewall slopes of SU-8 HARMST using deep x-ray lithography*, J. Micromech. Microeng. 18, 035037 (2008) was chosen by IoP for a special collection of journal articles. This collection was chosen by the editors for papers that show substantial advances or significant breakthroughs, have a high degree of novelty and/or have a significant impact on future research.

3rd CXS Annual Workshop to be held in September!

Physicists and biologists working together is what has made CXS the dynamic team that it is today and has continued to grow from strength to strength.

We are pleased to announce that the 3rd Annual Workshop 2008 will be held from the 17th to the 19th of September at Bio21, Melbourne, Australia.

This workshop will be focusing on high resolution diffractive imaging of biological samples using synchrotron, high harmonic generation laser and X-ray free electron laser sources.

The workshop program will include:

- Protein Structure Determination
- Imaging of Biological Systems
- Advanced Microscopy
- Optics and Imaging

- Sources and Detectors
- Coherent Diffractive Imaging

Other features include poster and oral presentations of recent research, a tour of the Australian Synchrotron and a workshop dinner.

Speakers include:

- Henry Chapman, DESY Synchrotron, Germany
- So Iwata, Imperial College, London, UK
- Ferenc Krausz, Max Planck Institute of Quantum Optics
- Werner Kuhlbrandt, Max Planck Institute of Biophysics
- Daniela Stock, Victor Chang Institute, Sydney
- Lothar Struder, Max Planck Institute of Physics

Further speakers to be announced. Please visit: <http://131.172.132.43/CXS/> for the up-to-date information.



Bio21 - the venue for the 2008 Workshop

Linking with the CRC for Biomedical Imaging Development



CXS and CRC BID sign a Memorandum of Understanding

CXS is pleased to announce the signing of a Memorandum of Understanding (MOU) with the Cooperative Research Centre in Biomedical Imaging Development Limited (CRC BID).

The CRC BID programme aims to develop new and advanced imaging techniques and equipment for application in biomedicine; foster the growth of Australian expertise in biomedical imaging and build the nation's capacity to serve the needs of researchers, clinicians and industry people working in this field.

The MOU, which runs until mid 2010, was the result of contacts established

through the CXS Detector and Beamline Development Program and Experimental Methods Program. The centres' groups will work toward the development of detector instrumentation.

Professor Keith Nugent of CXS welcomed the signing of the MOU and said that it was an excellent outcome and will be valuable in strengthening our connections with industry.

CXS looks forward to a fruitful relationship with CRC BID.

Structures in a Flash!

Molecular Biophysicist and Photon Scientist, Professor Janos Hajdu, gave the first free public lecture in a series hosted by CXS.

Professor Hajdu's lecture: *Structures in a Flash! X-ray Lasers, Exploding Molecules and Biological Insights*, was held on Friday 8th of February at the Sidney Myer Asia Centre at the University of Melbourne.

Addressing an audience of approximately 80 people, Professor Hajdu drew on his recent experiences in Antarctica and his current research at Uppsala University in Sweden and Stanford University, USA.

His research is seminal in developing the theory, approach and instrumentation that will enable the use of the world's first X-ray free electron laser, the Linac Coherent Light Source, which is being built at Stanford Linear Accelerator Centre (SLAC).

This free public lecture was the first of six to be offered by CXS to the general public throughout 2008.

Please visit www.coecxs.org for information on further lectures.



Professor Janos Hajdu informed and entertained the public with his free public lecture

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The ARC Centre of Excellence for Coherent X-ray Science (CXS) is an Australian Government Initiative which began in July 2005 to explore what can be achieved with coherent X-ray optics; including an understanding of exotic phenomena such as X-ray phase discontinuities.

CXS headquarters is located at the University of Melbourne in Victoria, Australia, with participating nodes at La Trobe University, Monash University, Swinburne University of Technology and the CSIRO. Its mission is to be the world leader in the development of non-crystallographic techniques for the determination of protein structures.

"In Coherence" is produced quarterly by CXS. Contributions are welcome and should be forwarded to Ms. Tania Smith, CXS Chief of Operations, University of Melbourne Vic 3010, fax to +61 3 9347 8912, email: cxsenquiries@ph.unimelb.edu.au or Ms. Rosslyn Ball, Administration, email: r.ball@ph.unimelb.edu.au

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Special thanks to Rosslyn Ball for her contributions to the Autumn 2008 edition.

2007 End of Year Overview



Benedicta Arhatari and Bo Chen

Of particular interest to the students during the program overviews were:

- Each programs research achievements in 2007 (basic science)
- How program science relates to the overall goals and mission of CXS
- How competition in research and industry relates to each program and to CXS as a whole
- Global influences
- Highs and lows of the year
- Future plans
- Wish lists for 2008

At lunchtime a scrumptious Christmas barbeque with plenty of beer and wine was had by all while the serious business of award voting began.

The afternoon session offered each member of CXS the unique opportunity to ask each program team questions on any topic they liked. Questions ranged from the cross disciplinary bases of research, the meaning of words, through to descriptions of what its like to work at a specific node.

The day ended with the awards presentation, voted for by the students and presented by Professor Jose Varghese.

The End of Year Overview proved to be an excellent opportunity for students within CXS to develop their skills in:

- Organisation
- Promotion
- Networking

- Public speaking
- Effective communication
- Presentation skills
- Teamwork

With the 2007 overview being such a great success, we look forward to the students returning in 2008 for a repeat performance!



Andrew Pogany and Andrew Peele viewing posters

The student led 2007 End of Year Overview was held on the 20th December at the University of Melbourne.

All areas of CXS came together to hear program overviews and discussion sessions by each Program team. Students also developed posters that were available for viewing throughout the day.