

9th AINSE / ANBUG Neutron Scattering Symposium

AANSS 2010

1 - 3 December 2010
Lucas Heights, Australia

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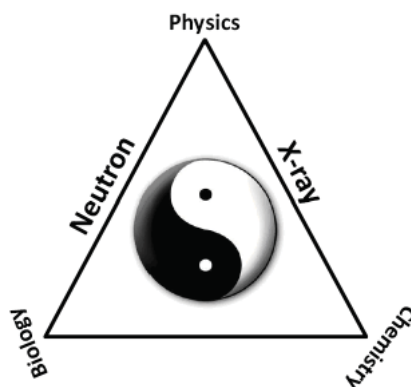
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Foreword

Neutron and X-ray Scattering - from Biology to Physics

This is the ninth AINSE/ANBUG Neutron Scattering Symposium. The number nine represents a part of the Yin and Yang symbol. The philosophy of the Yin and Yang is certainly the essence of this Symposium where Neutron and X-ray progress and interconnect together from Biology to Physics to give rise to each other in turn. This highlights the value of AINSE acting as a focus for the neutron scattering community in Australia, on the continuing strength of neutron scattering as a technique, on the ever-increasing profile and productivity of OPAL, and also developing and maintaining networks with other communities in a multi-disciplinary environment.



The AANSS 2010 gathers together the neutron and x-ray scattering communities under the theme 'Neutron and X-ray Scattering – from Biology to Physics'. The theme represents a universe where the driving forces are diversity, interconnection and communication. We assembled a range of themed sessions mapped out since the beginning, and the abstracts received created the interesting shape of the program. We believe we have succeeded in assembling a good mixture. We have an opening session addressing the history and development of the interaction between the X-ray and Neutron communities, Membranes and Biological relevant materials, Condensed Matter Physics, Surfactant – Polymer - Surface and Interface, Medical and Imagery, Software – Modeling, Protein Structure - function and dynamics, Instrument concepts/ Techniques and developments, ANBUG Awards, Chemistry and Earth sciences and Beamline updates. We have talks from experienced scientists, Ph.D. students and mid-career researchers. Some talks focus particularly on neutron or X-ray scattering, others present it as complementary techniques or as one amongst many techniques. A very pleasing proportion of the work was performed at ANSTO and at the Australian Synchrotron, yet there are also presentations that demonstrate the value of access to the major international neutron and X-ray scattering centers. Overall, we believe the program reflects the breadth, depth and quality of the ninth AANSS theme.

We gratefully acknowledge the financial support of our Silver sponsors, AVT services and John Morris Scientific and our Bronze sponsor Scitek Australia. We encourage everyone attending the meeting to view the posters at every opportunity, and also to explore the displays of the exhibitors who are supporting the meeting. We wish you an enjoyable and stimulating three days of scientific diversity, networking and discussion.

Program

Wednesday 1 December 2010

Session 1 Opening

Chair: John Carver

09:30 – 09:40 Welcome: Dennis Mather

09:40 – 10:30 Opening Plenary: Chris Ling 1
The political and economic complementarity of neutrons and x-rays

10:30 – 10:50 Morning Tea

Session 2 Membranes and Biological relevant materials

Chair: Andrew Nelson

10:50 – 11:20 Invited: Duncan McGillivray 2
The role of antioxidant-protein interactions in phospholipid membranes

11:20 – 11:40 Stephen A Holt 3
Neutron scattering gives a new perspective on a protein translocon

11:40 – 12:00 Chris J Garvey 4
Towards a molecular mechanism for the protective effects of sugars on membrane damage during dehydration

12:00 – 12:20 Anton P Le Brun 5
Structural analysis of membrane protein arrays used in biotechnology

12:20 – 13:20 Lunch

Session 3 Condensed Matter Physics

Chair: Trevor Hicks

13:20 – 13:50 Invited: Annemieke Mulders 6
X-ray and neutron diffraction studies of ordering phenomena in multiferroic materials

13:50 – 14:10 Stewart J Campbell 7
Influence of applied magnetic field on magnetovolume effects – re-entrant ferromagnet $\text{Pr}_{0.5}\text{Y}_{0.5}\text{Mn}_2\text{Ge}_2$

14:10 – 14:30 Yun Liu 8
In situ investigation of lead-free $\text{Bi}_{0.5}\text{Na}_{0.5}\text{TiO}_3$ piezoelectric ceramics under an electrical field via high intensity neutron powder diffraction

14:30 – 14:50 Andrew Princep 9
A theoretical framework for soft x-ray resonance enhanced Bragg diffraction

14:50 – 15:10 Afternoon Tea

Session 4 Surfactant, Polymer, Surface and Interface

Chair: Lizhong He

15:10 – 15:40	Invited: John White Resistance of interfacial β -casein to chymosin enzymatic degradation	10
15:40 – 16:00	Elizabeth Fellows Dynamic interplay between spin crossover and host-guest function in porous coordination polymers	11
16:00 – 16:20	Philip Reynolds High-internal phase emulsions under shear. II. Co-surfactancy and shear stability	12
16:20 – 16:40	Joo Ang Structure of HSA at the air-water interface and effect of fatty acid on HSA - silica nanoparticles interaction	13
16:40 – 18:10	Poster session (AINSE Council Room)	
18:10 onwards	Barbeque dinner outside AINSE Theatre	

Thursday 2 December 2010

Session 5 Medical and Imagery

Chair: Stephanie Corde

09:00 – 09:50	Plenary: Bill Thomlinson Medical applications of synchrotron radiation: growth and outlook for an emerging field of science	14
09:50 – 10:10	Cyril Curtain Shedding light on neurodegeneration; SAS and misfolded proteins	15
10:10 – 10:30	Ron White Towards a model for positron transport in soft-matter for PET	16
10:30 – 10:50	Khay Fong Light responsive nanostructured matrices for pulsatile drug delivery	17
10:50 – 11:10	Morning Tea	

Session 6 Software – Modelling

Chair: Darren Goossens

11:10 – 11:40	Invited: Susanna Guatelli Effect of a magnetic field in radiotherapy: a nanodosimetric study	18
11:40 – 12:00	Anthony Chesman A structural and computational study of the formation of the carbamoylcyanonitrosomethanide anion	19
12:00 – 12:20	Jessica Hudspeth Strategies for modeling short-range order in molecular crystals	20

12:20 – 12:40 Andrew Nelson
The use of Chebyshev polynomials in the free form fitting of
featureless neutron reflectivity data 21

12:40 – 13:40 Lunch

Session 7 Protein Structure, function and dynamics

Chair: Agata Rekas

13:40 – 14:10 Invited: Terry Mulhern
Using small-angle x-ray scattering to gain insight in the catalytic
regulation of signaling enzymes in health and disease 22

14:10 – 14:30 Flynn Hill
Structure, dynamics and function of a replisomal protein complex 23

14:30 – 14:50 John Carver
X-ray and neutron scattering studies of the molecular chaperone
 α -crystallin enables localization of ligand binding sites 24

14:50 – 15:10 James Taylor
Shape reconstruction of biological macromolecules involved in
defense against viruses and those that interact with viral proteins 25

15:10 – 15:30 Afternoon Tea

Session 8 Instrument concepts/ Techniques and developments

Chair: Michael Hofmann

15:30 – 15:50 Wai Lee
Up-coming neutron polarisation analysis capabilities for 6 OPAL instruments 26

15:50 – 16:10 Paolo Imperia
Sample environment projects and operations at the Bragg Institute 27

16:10 – 16:30 Tamim Darwish
Advancements at the National Deuteration Facility: deuteration of oleic
acid, lipids and other molecules for neutron studies 28

Session 9 ANBUG Awards

Chair: Chris Ling

16:30 – 16:45 ANBUG Award for Neutron Science

Maxim Avdeev
Powder diffraction data analysis: beyond the Rietveld method 29

16:45 – 17:00 ANBUG Award for Career Achievements in Neutron Science

Chris Howard
The Renaissance in Powder Diffraction - An Australian Perspective 30

17:00 – 17:30 ANBUG AGM

18:30 Bus from AINSE to Conference Dinner

19:00 – 22:00 Conference Dinner Thai Peninsular Restaurant

Friday 3 December 2010

Session 10 Chemistry and Earth sciences

Chair: Alison Edwards

09:00 – 09:50	Plenary: Darren Goossens Short-range order in functional oxides	31
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10:10 – 10:30	William Brant Development of defect perovskites for use as cathode materials in lithium ion batteries	33
10:30 – 10:50	Abbas Ranjbar <i>In-situ</i> neutron diffraction study of the kinetics of hydrogen absorption and desorption in Mg based materials	34
10:50 – 11:10	Morning tea	

Session 11 Materials, Engineered and Applied Materials

Chair: Stewart Campbell

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12:00 – 12:20	Erich Kisi Can neutrons determine elastic constants better than ultrasound?	37
12:20 – 12:40	Rashmi Nigam Neutron powder diffraction studies of magnetic order in Ru-based high temperature magnetic superconductor	38
12:40 – 13:40	Lunch	

Session 12 Beamline updates

Chair: Dehong Yu

13:40 – 14:10	Invited: Michael Hofmann Stresses and more – Materials Science at the neutron diffractometer STRESS-SPEC at FRM II	39
14:10 – 14:40	Invited: Nigel Kirby An update from the Australian Synchrotron SAXS/WAXS beamline	40
14:40 – 15:00	Christine Rehm Kookaburra - a state-of-the-art USANS instrument	41
15:00 – 15:10	Meeting close	

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