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# Society of Crystallographers in Australia and New Zealand SCANZ

(formerly: Society of Crystallographers in Australia (SCA))

The SCANZ homepage is located at <http://www.sca.asn.au>

## March 2008 Newsletter

### From the President (Steve Wilkins, CSIRO)

It is with great pleasure and a few concerns that I have taken up the role of President of SCANZ, commencing last April. SCANZ is an organization with a great and proud past, tracing its origins back to the "Bush Crystallographers" who held meetings every year or two with the organization baton passed from one group to another from one meeting to the next. The idea of a formal organization was stoutly resisted until it was made inevitable by a bid to hold an IUCr Congress in Australia. In the event, the bid was successful and resulted in a highly successful Congress in Perth in August, 1987, both scientifically and financially, yielding the 1987 Fund that remains a very significant financial asset of the Society. In the days of the Bush Crystallographers, there was strong involvement from both X-ray and electron crystallographers, who might have numbered about equal, and with a lesser number of neutron crystallographers. The crystallographic community at that time was comparatively small and tightly knit.

From these simple beginnings, the seeds of the SCA (later to become SCANZ) were sown. The Society has progressed in many ways and has strengthened its links to countries in the Asian region, as exemplified by its involvement in the formation and activities of AsCA (Asian Crystallographic Association). It now holds joint (CRYSTAL) meetings with AsCA and the Japanese Society for Crystallography (JCS). SCANZ members play an important role on AsCA and have helped guide its course not to mention that of the IUCr. Australia has played a strong role in the formation and progress of AsCA - one of our members, Mitch Guss (USyd), is the current President of AsCA. The growth and strength of AsCA is in part a reflection of the wider growth in economic and scientific strength of countries in the Asian region, with the next AsCA (Beijing, 2009) expected to attract around 800+ attendees!

On the local scene, crystallographers in Australia and New Zealand are entering a new golden age with the rapidly growing availability first-class infrastructure for crystallographic-related research, spanning both a high performance 3GeV storage ring (the Australian Synchrotron) and a high-flux research reactor (OPAL). These have recently come on stream and have started to produce useful data over the past year. These facilities possess a tantalizing range of instruments of great value to crystallographers and will be rapidly expanded in range and capability with time. These major national facilities presently amount to close to A\$1B in investment in scientific infrastructure, an amount undreamed of a decade ago. They greatly expand the possibilities for crystallography-related research in accuracy, time-resolution and sensitivity. They also bring with them new ways of doing crystallography, including robotics, remote access and telepresence. In addition, they greatly help foster both national and international collaborations. We have just concluded a very successful ASRP/AS Users meeting in Melbourne, with around 300 attendees. This coincided with the Scientific Opening of the Australian Synchrotron on 11 December.

This dawning of a new golden age in Australian science conjures memories of a time 22 years ago when I was on a 1 month Japanese Society for the Promotion of Science sponsored visit to Japan at the invitation of Professor Jimpei Harada. The trip included a visit to the Photon Factory where I met the various directors and also Prof Masami Ando. It was at this meeting that I received an invitation for Australia to build a beamline at the Photon Factory, where the PF would provide the front-end and the controls, and we would provide an end station. Dudley Creagh and I spent the next 4 or so years lobbying Federal and State governments as well as local funding agencies, seeking to obtain the necessary funds to build the end station. With the advent of the ASTEC Report "Big Science - Small Country Report" (which one Japanese wag thought should be the other way around) on major scientific facilities, we received funding of order A\$3M to build a beamline at the Photon Factory. This kept Dudley Creagh and me (and many others) busy for another 3 or so years guiding the development of the monochromator (Dudley) and (me) the diffractometer ("Big-Diff") for the ANBF. Richard Garrett, David Cookson, and many others contributed to the development of this beamline (both in the construction phase in Australia) and over the years while installed

at PF. It was rewarding to hear Professor Soichi Wakatsuki (current Director of the PF) say at the recent Users Meeting that this beamline (20B) currently produces 60 to 90 papers a year and is the most productive beamline at PF. It transpires that over 600 papers have been produced using this beamline since its commissioning. This beamline gave us a chance to cut our teeth on the development of hard X-ray instrumentation at a synchrotron and also gave us a large measure of control over our own scientific directions in this field.

We are now embarking on a new exciting era of great opportunity for crystallographers in Australia and NZ, enabling us to compete on much better terms with our counterparts in other parts of the world than previously. It is also a time when the nature of an answer to the question as to "What does it mean to be a crystallographer?" is less clear than it has been in the past, and also where the role of SCANZ is, I believe, much in need of review and reconsideration, if it is to be relevant to the interests of its members and to serve the wider interests of the related scientific communities in Australia and NZ. These are matters I look forward to discussing with Council and the membership over the next few months with the aim of developing a new vision and expanded role for SCANZ. This is the first SCANZ Newsletter for some time, but hopefully it will again become a regular event, now under the editorship of Paul Jensen (Chemistry, USyd).

### **Past President's Report – April 2007 (Brendan Kennedy, USyd)**

I have been fortunate during my term as president in having witnessed both the OPAL reactor at Lucas Heights reach full power, and the Australian Synchrotron in Melbourne achieve light to a beamline. These two facilities have the potential to revitalise crystallography provided they are adequately supported by the appropriate funding agencies and the need to maintain world class facilities in the Universities and National Laboratories that produce the samples, studied at OPAL or the synchrotron, is acknowledged. At the time of writing this report the future for OPAL looks promising – the scientists are struggling with the fortunate problem that the flux on the instruments is somewhat higher than anticipated. This may be the only time you hear neutron scientists complaining about too much flux. Commissioning of the instruments is moving along and already the two powder diffractometers are collecting patterns and structures have been refined. Unfortunately the same cannot be said for the Australian Synchrotron. Scoring political points seems to be more important than developing world-class scientific infrastructure. Hopefully we will not have to wait until there is a change in government before the State and Federal bodies can acknowledge the need to fully support this great facility.

The "black spot" on my tenure has been the NCRIS process. Most crystallographers started this process full of optimism. Whilst there may not be much in NCRIS for individual laboratories, both OPAL and the Synchrotron are Major Collaborative Research Infrastructure and worthy targets for NCRIS support. Unfortunately both received only very modest support from NCRIS. Like most other users of synchrotrons I am grateful that NCRIS has provided modest support to extend the life of the ASRP, however I wonder if this will be adequate. Talking to people involved in microscopy the picture is no rosier, and in fact one wonders if characterisation has been re-defined to exclude crystallography without telling anybody.

My other concern is the future of the "Bush Crystallography Meetings". Many of us receive numerous invitations to major international conferences that we can easily justify attending, and it is easy then to let the smaller domestic meetings slip. This is especially true for "technique" based societies such as SCANZ. How many SCANZ members call themselves crystallographers and how many call themselves chemists, physicists, etc? The finances of the Society are very strong and perhaps we should look at the strategic use of these to strengthen the benefits to the active members – that is those members who support the society through their involvement at meetings.

### **1987 Maslen Scholarship Recipient Reports – Crystal XXV April 2007 (selection only)**

*Nyssa Drinkwater (Institute for Molecular Bioscience, UQ)*

The Maslen scholarship allowed me to travel to the CRYSTAL XXV conference held in the lovely Hunter Valley in April of 2007.

The conference encompassed all aspects of crystallography exposing me to areas of the field that I have had little exposure to in the past. Small molecule and protein crystallography were covered in detail as well as the huge range of applications and research potential of these sciences. Furthermore, much time was devoted to the presentation of new techniques related to structural biology, as well as the new facilities and services available locally that allow structural studies of anything from small molecules to large macromolecules.

Some of the research that I found highlighted the scope of the conference included that presented by Janos Hajdu. Prof. Hajdu's research involves the development of the new technique flash diffractive imaging. The basic principles behind this technique were presented, as well as the proof of principle, which was illustrated with the imaging of live picoplankton.

Also presented was information on the various new facilities being erected all around Australia. This illustrated to attendees the immense research opportunities becoming available to us close to home. These included updates on the OPAL reactor and the Australian synchrotron beamlines.

Additionally the conference allowed students of all levels to present their research. I was given the opportunity to give an oral presentation of my work related to the structure based design of inhibitors for the adrenaline synthesising enzyme Phenylethanolamine *N*-Methyltransferase. This was a fantastic opportunity and I found it extremely valuable to receive feedback on my research from a wide range of international researchers. In general the conference was an invaluable opportunity to all students, many of which were given speaking slots, or presented posters, and the arena for interaction between these students and other researchers was invaluable.

All in all the Maslen scholarship allowed myself as well as many other students to experience a fantastic conference, and I would like to thank SCANZ for giving us this opportunity.

*Mihwa Lee (School of Molecular and Microbial Biosciences, USyd)*

First of all, I would like to thank SCANZ for providing me with a wonderful scholarship to attend Crystal XXV in the Hunter Valley, NSW. I sincerely think that SCANZ is one of the best organisations, if not the best, in supporting students to attend exciting meetings and conferences in Australia as well as overseas.

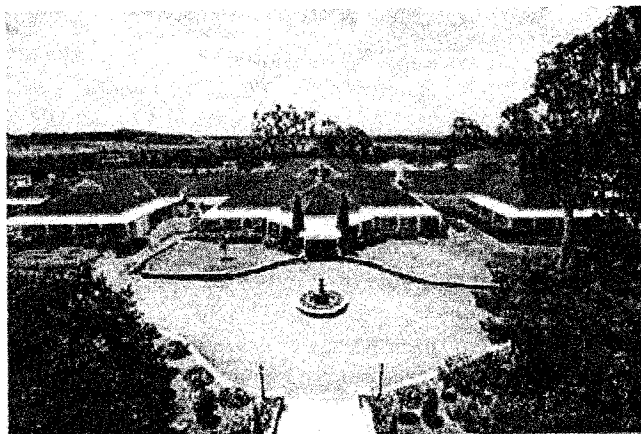
There were many highlights of Crystal XXV and one of the most impressive talks was given by Prof. Janos Hajdu, on a single-particle diffraction. The thought that a protein structure can be solved by hitting a single molecule with an X-ray pulse is simply mind blowing. By-passing crystals and getting images of macromolecules in atomic resolution from single particles may still be years away but the current progress in single-particle diffraction is impressive enough, even if it may mean that crystallographers will ultimately be out of job.

It was also very exciting that the Australian synchrotron will be accepting users in very near future. As a NSW resident, going to the synchrotron still means travelling, but access to the domestic synchrotron will make a great difference to macromolecular science.

The conference was a great opportunity to meet crystallographers working actively in Australia and New Zealand. Sharing ideas and getting advice from these people under the influence of Hunter Valley wine was definitely the highlight of the conference. For that reason, I would again like to thank SCANZ for the scholarship.

*Laura McCormick (University of Melbourne)*

Conferences seem to start with an early morning flight, and this one was no different. We arrived in Sydney from Melbourne at 8.30ish in the morning, and proceeded to the Sydney Central railway station, where there was a bus arranged to take us from Sydney to the conference. Between Sydney and the conference we had to make two stops – one for cold drinks and another to change buses, after the air conditioning gave up the ghost. At the hotel, however, our troubles were over. The 40ha estate in which the Sebel Kirkton Park is set has a peaceful atmosphere and luxurious accommodation.



Being my first crystallographic conference, I was somewhat overwhelmed by the range of topics that were incorporated into crystallography, most of which I had never encountered before – neutron diffraction, crystallography at the beamline and updates on facilities, protein crystallography and crystal growth, the theoretical aspects and facilities behind crystallography which I had always taken for granted. The two sessions which I was particularly interested in were those that dealt with small molecule structures. Cameron Kepert's presentation on the incorporation of guest molecules into the channels of a coordination polymer was fascinating, especially as he referred back to his undergraduate notes from lectures given by Prof. Allan White! Tony Cheetham's presentation was another standout, showing how a variety of techniques could be used to build up a more complete understanding of a given structure. The blend of neutron and X-ray diffraction with theory I found particularly intriguing. The poster session provided everyone with the opportunity to both ask and field questions about their research. I was thrilled at how willing people were to share their time and ideas.

Socially, Crystal XXV was a great opportunity to meet the people behind the papers. At the conference dinner, the "students table" was a riot, and the older students were very happy to offer encouragement and advice on how to stay sane to those in the early research days. After the conference dinner, Prof Allan White spoke about his life in crystallography, and his journeys from Melbourne, to WA and beyond. His experiences, both amusing and informative, were very eagerly received by the audience.

I'd like to wholeheartedly thank SCANZ for providing me with the funding and opportunity to attend this conference.

*Caspar Schneider (Monash University)*

I would like to thank all those involved in organising SCANZ Crystal 25 for choosing me as a Maslen awardee. I'm quite humbled and appreciative for such acknowledgment of my research efforts. I would also like to thank all the speakers and fellow researchers for making it such an excellent and informative conference.

Crystal 25 was held amongst all places in the quaint hills of the Hunter Valley and during a week of blue skies and sunny warmth. If you went on a little wander you were never far away from lush scenery, friendly faces and a little tippie or two. However, yes, there was a serious side to the occasion and as soon as we arrived the talks began. Of all the high calibre presentations there are several that come to mind. Firstly the young crystallographers' session was quite a diverse and a most interesting session with all speakers giving excellent presentations filled with exciting chemistry. As well we can't forget Allan White's most interesting and never ending speech in honour of his life's dedication to science.

Much of my research is concerned with materials chemistry and small molecule crystallography and so amongst plenary speakers I most enjoyed Anthony Cheetham's talk on diffraction methods and materials science.

Overall, the conference finished with the enthusiasm and friendly atmosphere that it began with.

### **Le Fèvre Memorial Prize**



*Dr Stuart Batten, School of Chemistry,  
Monash University.*

The Australian Academy of Science has awarded the Le Fèvre Memorial Prize to Dr Stuart Batten, Senior Lecturer, School of Chemistry, Monash University. Stuart has made significant and original contributions in the area of crystal engineering. He was a member of the group that pioneered the design of coordination polymers, focusing on the use of trigonal three-connecting ligands. He helped to discover a new class of magnetic materials based on the dicyanamide ligand. He has also developed a naming system to describe the ways networks interpenetrate, which has been adopted by researchers worldwide. His latest research includes the design of 'nanoballs' that have magnetic and photomagnetic features.

### **A Slice of History (Tim Bastow & Harry Whitfield, CMSE)**

The conference "Celebrating 50 years of Multislice" (part sponsored by CSIRO) was held on Melbourne Cup Day (Tues 6<sup>th</sup> Nov 2007) under flawlessly blue skies at the Brighton Savoy Hotel. The conference, conceived and expertly organized by Phil Nakashima (Monash University) was nicely timed to celebrate the invention in 1957 by Alex Moodie and John Cowley (at the time in the Chemical Physics Section in the CSIRO Division of Industrial Chemistry at Fisherman's Bend Melbourne) of the first quantitative theory of electron scattering by crystals. This became known as multislice theory. It enabled quantitative interpretation of electron diffraction patterns and electron microscope images of crystals at atomic resolution. The seminal paper was published in 1957 and cited several important theoretical background papers, also by AM and JC, that finished up being published subsequently.

Alex and John designed, and Jock Mills built, the world's first high resolution diffraction camera which was used to test the new theory. A considerable number of distinguished workers collaborated with Alex and John in Melbourne and later with John in Arizona to exploit and extend the theory. Some of the original workers who were at the Brighton Savoy gave presentations which included anecdotes and contemporary photographs of Alex and John and collaborators in their "temporary" huts at the Fisherman's Bend laboratory. These were smoking times.



Rene Brugmans, Alex Moodie and Ernst Chakinovskis outside their "temporary" hut at Fisherman's Bend in March 1963.

The conference chair and convener, Associate Professor Joanne Etheridge (Monash University, (Centre for Electron Microscope Studies, CEMS), opened the conference and welcomed attendees from overseas (two from Oxford University) and from universities in WA, QLD, SA, NSW and Victoria. The plenary speaker David Cockayne, Alex and John's second research student, then at Melbourne University and now Professor of Materials at Oxford University, reflected on the early history of the multislice theory in interpreting electron diffraction from crystalline materials and his present interest in electron diffraction by amorphous materials. He also recalled that at a very early stage close inspection revealed the initial multislice to be a theory of positron diffraction until close scrutiny by someone (David quietly declined the credit) discovered the maverick wrong sign and it became a theory of electron diffraction as intended. But as he said, when the positron microscope is perfected the relevant theory is already in the drawer.

Alex spoke next on an 'onlie begetter's' overview of Multislice, launching confidently into his first Power Point presentation and treating the topic compactly, with his usual panache. There were some thoughtful musings on the evolving contraction of the descriptor (not used in the original paper) multi slice, multi-slice and multislice, with determined input from the audience, a number of whom had brought ancient paper evidence with them.

Among the speakers with a CSIRO connection were Andy Johnson (now at University of WA, Perth) who was an early multislice user in the Electron Diffraction Section at Fisherman's Bend, and spoke on early developments and applications, Andrew Smith (from the Division of Chemical Physics at Clayton, now at Monash University Physics Dept.) who spoke on the reflection multislice method, and Andrew Pogany (who joined John Cowley's group at Melbourne University, and is now with Steve Wilkins' X-ray imaging group at Materials Science and Engineering at Clayton) gave a recollection of developments in the early 60's and reflected on the underlying similarities between the currently developing theory of phase contrast X-ray imaging and the original Cowley-Moodie multislice theory.

Recollections by a number of participants who were around in 1957 and before, revealed that the innovative and crucial electron diffraction camera was designed and built in a manner somewhat at variance with present OH&S practice, which speeded up its development considerably. Some hairs stood on end more than usual due to charging effects, but there were no recorded deaths.

There was an encouraging number of young scientists present, mainly from CEMS Monash University, and some from RMIT which has been the source of a number of bright students attracted by Alex Moodie's inspiring lectures in his tenure there as a Professor in the Applied Physics Dept. One of these ex-RMIT graduates, Christian Dwyer, briefly a vacation student in a later version of the Division of Chemical Physics and who completed a PhD at Oxford in David Cockayne's department before joining Jo Etheridge's CEMS group, gave a riveting talk with a bravura attack using multislice theory (both relativistic and non-relativistic) on the calculation of atomic inner-shell ionization, and furthermore illustrated the capabilities of modern high performance electron microscopes with impressive confirmatory experiments.

A Melbourne Cup sweep was held with participants drawing (properly randomized!) two dollar tickets out of a hat. A short break around 3 pm was taken to watch the Cup, after which it turned out that a statistically unlikely number of payouts were to members of the organising committee. There will be a stewards' inquiry.

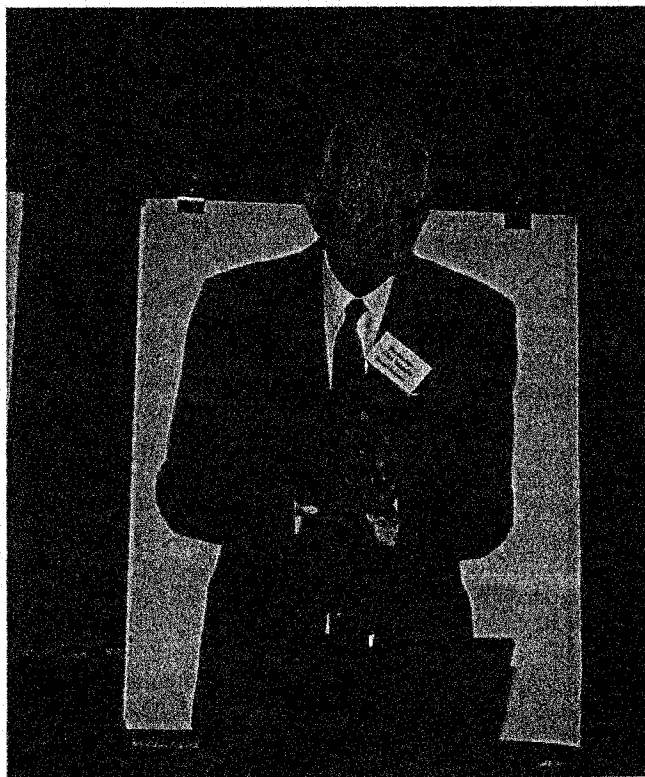
The conference finished with group photographs and a dinner. Alex was presented with a crystallographic religious icon, which gave him the opportunity to talk happily and at length about one of the secular saints of crystallography, Kathleen Lonsdale. Despite calls for madder music and stronger wine the party broke up around 10:30 and we all went home.

### Multislice (Ray Withers, ANU)

This year (2007) marks the 50th anniversary of the publication of the revolutionary theory in physical optics that gave rise to the multislice formalism by John Cowley and Alex Moodie. At that time electron microscopy was only just emerging as a new tool in materials science, its probing power arising from the small wavelengths of high energy electrons and their incredibly strong interaction with materials. The latter posed the monumental problem of how to quantitatively describe the scattering of electrons in solids. It was clear that without such a theory, the full power of electron microscopy could not be realized. The theory presented by Cowley and Moodie in their historical papers of 1957 and '58 gave rise to quantitative analysis in both diffraction and imaging. The resultant multislice approach is now an integral part of many analytical software packages and has found application well beyond electron scattering, in both visible light and X-ray optics. The magnitude of this seminal contribution was recognized by the International Union of Crystallography via the award of the inaugural Ewald Prize to John Cowley and Alex Moodie in 1987 - the 30th anniversary of their theory.

A one day symposium to celebrate this most important milestone in microscopy was held on November 6<sup>th</sup> in Melbourne at the Brighton Savoy Hotel organized primarily by Philip Nakashima and colleagues at the Monash Centre for Electron Microscopy (MCEM). There were attendees and speakers from many Australian Universities as well as many colleagues past and present from CSIRO, RMIT and even colleagues from Oxford University and the University of London. Proceedings were kicked off

by Prof. David Cockayne who gave his reflections on the past, present and future for the multislice formalism followed by the star of the show, Alex Moodie (see below), who gave a wonderful exposition of the power of mathematics and its use in the development of the multislice formalism.



Prof. Alex Moodie

Many speakers recalled the early history of the electron diffraction section of the CSIRO Division of Chemical Physics where the multislice theory was developed, as well as the early days of electron microscopy in Melbourne. A wonderful day of reminiscences was capped off by a Symposium Dinner in honour of Alex Moodie and John Cowley. Thanks to Philip and to MCEM for organizing the symposium.

### **1987 Maslen Scholarship Recipient Reports – AsCA '07 November 2007**

*Richard Clements (School of Chemistry, USyd)*

A 1987 Maslen Scholarship was awarded in 2007 to me for attendance at the AsCA '07 conference in Taipei and the Second Asia-Oceania Forum for Synchrotron Radiation Research (AOFSSR) held at National Chiao Tung University, HsinChu, Taiwan. In the weekend between AOFSSR and AsCA, the IUCr crystallography school was held at National Tsinghua University, HsinChu, Taiwan which I also attended.

At the AOFSSR a poster was presented and two days of seminars attended. It was an interesting and valuable experience to learn about research being conducted with synchrotron radiation in areas outside of crystallography, particularly in the design of new synchrotron facilities, as well as current research in crystallography. Of particular interest was the talk given by Dr. Hwu of Academia Sinica on nanofabrication and nanomedicine with synchrotron x-rays. Using x-rays to synthesise nanoparticles of metals and polymers, Dr. Hwu can use synchrotron x-rays for in-situ targeted drug release.

At the IUCr crystallography school, a range of lectures were given from fairly in-depth theory to more introductory topics. These classes covered both more specialised techniques as well as standard techniques. The elementary classes were of close relevance and interest to an early candidature student such as myself. The lectures covering less familiar techniques and those focussing more heavily on theory were important for familiarising me with previously un-encountered material. As such, I found the school an important pre-cursor to attendance at AsCA.

AsCA '07 was the first international conference I have attended during my candidature. I presented a poster at the conference entitled 'Structural and Electronic Properties of Lanthanide Zirconates'. I found explaining my research to colleagues from other institutions to not be the daunting experience I had expected, but enjoyable and valuable for international networking. The plenary talk given by Dr. Wang from Georgia Institute of Technology was a highlight of the talks I attended. I found the



concept of "nanopiezotronics", which Dr. Wang introduced in his talk, to be one which left me thinking about the concept for a good deal of time after. Dr. Wang has grown nano-crystals with piezoelectric properties, which generate a charge when the crystal is deflected. Creating a matrix of these crystals and placing a corrugated plate on top of them allows an electrical generator. Dr. Wang proposes future applications of this technology in bio-sensing and as electricity sources using energy created by human movement for powering. It introduced me to an application of crystallography as a solution to a problem in which I would never have drawn a connection.

Sincere gratitude is extended to SCANZ for provision of the Maslen Scholarship that allowed me to attend the AOFSSRR, IUCr School and AsCA '07. Thanks are also extended to the School of Chemistry, University of Sydney; the Bragg Institute, Australian Nuclear Science and Technology Organisation; the Australian Institute for Nuclear Science and Engineering; and the Australian Synchrotron Research Program for supporting my candidature.

*Paul Saines (School of Chemistry, USyd)*

I would like to begin by thanking SCANZ for enabling me to attend AsCA 2007 in Taiwan. It was a wonderful experience to attend a world-class conference while also providing an opportunity to soak up the sights and sounds of Taiwan. The 2007 AsCA conference was an excellent opportunity to listen to outstanding researchers talk about their work in the context of the crystallography involved and also hear about some outstanding new developments at facilities such as JPARC and the APS as well as Australia's two new major facilities, the Australian Synchrotron and the OPAL reactor. These major facilities are particularly interesting to me as a solid state chemist whose research requires the use of high quality synchrotron X-ray and neutron powder diffraction from such facilities in order to determine the structures of complex metal oxides. It was very interesting to hear about some of the new powder diffractometers and their capabilities and think about the more complicated problems that these new facilities will allow researchers in the area to solve in the near future. Similarly it was good to hear about the applications of these facilities to solve particular structural problems, including some interesting work on magnetic structures, using powder diffraction.

The plenary speakers presented some fascinating work with the talk of Dr. Zhong Lin Wang regarding his work on nanopiezotronics and power generation using nanoelectronics, being in my opinion the outstanding talk of the conference. Other sessions also provided a chance to learn about what is going on in other areas of crystallography such as framework materials like zeolites and inorganic co-ordination compounds. The poster sessions were interesting and provided the opportunity to interact with researchers throughout Asia and in particular provided some interesting posters on perovskites such as the cation disorder in PZT and PMN piezoelectrics. Similarly the conference dinners provided a chance to mingle with other researchers while also enjoy good food and drinks!

In addition to enabling me to attend AsCA 2007, being in Taiwan provided an opportunity to attend two other meetings - the First IUCr school on X-ray and electron diffraction in Asia and the second Asia and Oceania Forum on Synchrotron Radiation Research (AOFSSRR). The IUCr school provided an opportunity to learn more about some fundamental aspects of X-ray diffraction while also learning more about the strengths and limitations of various electron diffraction techniques, which was something that I did not know a lot about before. The AOFSSRR conference was much larger than the first one, which I attended last year in conjunction with AsCA 2006, and featured interesting talks on both X-ray and single crystal diffraction and on other techniques such as XANES. It was also interesting to listening to talks on the new generation of facilities, such as free electron lasers, and understand major synchrotron facilities better from the point of view of the physicists responsible for maintaining them.

The opportunity to visit the monuments and markets in both Taipei and Hsinchu in between attending these conferences was also very enjoyable and I would like to thank SCANZ again for making this trip possible.

*Neeraj Sharma (School of Chemistry, USyd)*

#### *Scholarship Use*

The Maslen Scholarship was used predominantly for airfares to attend the 8<sup>th</sup> conference of the Asian Crystallographic Association (AsCA) held in Taipei, Taiwan November 2007. The funding was also used to attend a satellite meeting - the 2<sup>nd</sup> Asia Oceania Forum on Synchrotron Radiation Research (AOFSSRR).

#### *AsCA '07 Highlights*

The plenary talks were of high quality and broadened my horizons in the field of crystallography. My background is in solid-state structural chemistry and the physical properties of novel materials. It was stimulating to learn about some of the fascinating advances outside my field, in areas such as protein crystallography and framework materials. The quality of all the presentations made me reflect on my technique as a scientific communicator and the need to clearly and precisely explain my work.

The plenary talk by Dr. Wang on wireless nanodevices for real time bio-sensing applications was fascinating. The method by which he approached the problems was something I have never thought of. The plenary presentation by Dr. Lal who was discussing high resolution X-ray diffraction techniques instilled ideas which I can use in my project. He was discussing a

system with similar attributes and chemicals to mine. I also found the presentations on multiferroics, substances that exhibit coupled ferroelectric and ferromagnetic properties to be informative. The compounds I have synthesised are potential templates for multiferroic compounds, so it is nice to see in detail, compounds which are already multiferroics.

The sessions I attended highlighted developments in facilities and science throughout the region. The presentation from Dr. Lee from the Advanced Photon Source was an interesting look at the current trends in synchrotron instrumentation and applications. The presentations by the representatives from JPARC, ANSTO and the Korean nuclear research reactors provided an insight into the future instrumentation that will be available.

The posters were very well presented and the organisation of the conference was great. The banquets and the opportunities to network with fellow students/scientists throughout the region were fantastic.

#### *AOF Highlights*

The presentations on the facilities available in the region and their capabilities were informative. I was impressed by the number of facilities available in Japan and the way they have led the region in synchrotron science and technology. I was also impressed with the achievements of the Australian Synchrotron.

#### *Poster Presentation*

A poster entitled 'Preliminary Structural Refinements and a New Synthetic Route to  $\delta$ -Bi<sub>2</sub>O<sub>3</sub>-Related Phases in the Bi-W-O, Bi-Mo-O, Bi-Ta-O and Bi-Nb-O Systems' was presented at AsCA and AOFSSRR. The poster was awarded 2<sup>nd</sup> best poster prize at AsCA and 3<sup>rd</sup> best poster prize at AOFSSRR. I thoroughly enjoyed discussing my work with the delegates at the conference.

I would like to thank the Society of Crystallographers in Australia and New Zealand for the scholarship. I have learnt a large amount of information from my experiences and will endeavour to incorporate some new ideas into my research.

### **Forthcoming Major Meetings**

**August 23-31, 2008** IUCr 2008 – XXI General Assembly and Congress of the IUCr. Osaka, Japan. [www.iucr2008.jp](http://www.iucr2008.jp)  
**July 25-30, 2009** ACA 2009 – XXI Toronto, ONT, Canada. [www.amerystalassn.org](http://www.amerystalassn.org)  
**August 9-14, 2009** ECM 25 – Istanbul, Turkey. [www.ecm25.org/](http://www.ecm25.org/)

### **Call for Comment - Medals**

The SCANZ Council is proposing to establish two medals to recognise scientific excellence in areas associated with the Society. The proposed guidelines are given below, and we invite members' comments and feedback on all aspects of the proposal. Please direct comments to Stuart Batten ([stuart.batten@sci.monash.edu.au](mailto:stuart.batten@sci.monash.edu.au)) by not later than April 30, 2008. We would like to have the first medals awarded at the next Crystal meeting (ca. April 2009).

Note that the medals currently have dummy names (and I apologise for the lack of a Richard Hadlee or Daniel Vettori medal). Once we have the guidelines finalised, we will visit the contentious issue of names.

Stuart Batten

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#### **The Don Bradman Medal**

*for distinguished contributions to science involving X-ray, neutron or electron diffraction and/or imaging*

1. The Medal shall be awarded to a financial member of the Society who, in the opinion of the SCANZ executive or duly appointed representatives, has contributed most towards the development of a branch of science associated with X-ray, neutron or electron diffraction and/or imaging.
2. The award is based on consideration of the candidate's published scientific work, together with other evidence of his or her standing in the international community. A major portion of the relevant scientific work must have been carried out in Australia and/or New Zealand while the candidate was a member of the Society.
3. The medal shall be awarded to coincide with SCANZ conferences, and the successful candidate will be required to deliver a lecture at the appropriate conference.
4. The award will consist of a medallion, free registration at the SCANZ conference at which they will receive the award, a return economy airfare from the awardee's home city and \$750 towards accommodation expenses (if the awardee is not a resident of the city in which the meeting is held). This will be provided by SCANZ in conjunction with the conference organisers.



5. The nominee must have been a member of SCANZ for the previous 10 years.

6. Nominations (including self-nominations) should contain the following information: a brief curriculum vitae; a list of publications; reprints of no more than 10 of the most significant of these publications; and any supporting information that could be helpful to the Selection Committee. Nominees should also arrange for two independent testimonials to be forwarded to the SCANZ Secretary.

7. Nominations should be forwarded to the SCANZ Secretary by the advertised deadline.

### **The Ricky Ponting Medal**

*for distinguished contributions to science involving X-ray, neutron or electron diffraction and/or imaging by a researcher under 40 years of age*

1. The Medal shall be awarded to a financial member of the Society who, in the opinion of the SCANZ executive or duly appointed representatives, has contributed most towards the development of a branch of science associated with X-ray, neutron or electron diffraction and/or imaging. This person shall be under the age of 40 at the time of close of applications, except in the case of significant interruptions to their research careers.

2. The award is based on consideration of the candidate's published scientific work, together with other evidence of his or her standing in the international community. A major portion of the relevant scientific work must have been carried out while the candidate was a member of the Society. Due consideration will be given to nominees with interrupted careers.

3. The medal shall be awarded to coincide with SCANZ conferences, and the successful candidate will be required to deliver a lecture at the appropriate conference.

4. The award will consist of a medallion, free registration at the SCANZ conference at which they will receive the award, a return economy airfare from the awardee's home city and \$750 towards accommodation expenses (if the awardee is not a resident of the city in which the meeting is held). This will be provided by SCANZ in conjunction with the conference organisers.

5. The nominee must have been a member of SCANZ for the previous 5 years.

6. Nominations (including self-nominations) should contain the following information: a brief curriculum vitae; a list of publications; reprints of no more than 10 of the most significant of these publications; and any supporting information that could be helpful to the Selection Committee. Nominees should also arrange for two independent testimonials to be forwarded to the SCANZ Secretary.

7. Nominations should be forwarded to the SCANZ Secretary by the advertised deadline.

### **On the Possible Establishment of new Standing Committees**

In earlier times SCANZ/SCA had a number of Standing Committees, e.g. if we look back to the SCA Newsletter of March 1982, (Issue No 4), it lists the following Standing Committees:

Electron Diffraction (Chair, David Cockayne)

X-Ray Diffraction (Chair Bruce Fraser)

Neutron Diffraction (Chair, Frank Moore)

Computing (Chair, Bruce Poppleton)

Nominations (Chair, Ian Dance).

Of these Standing Committees, only the Nominations Committee survives, and this is mandatory under our Constitution. Given the recent major investment (around \$1B) that governments have made in the establishment of major new research facilities in Australia and providing considerable benefit to crystallographers, I would like to raise for discussion by the membership any interest that may exist for the formation of new Standing Committees under SCANZ. We have already had an expression of interest for the formation of a Small-Angle Scattering Standing Committee (covering both neutrons & x-rays) and this is supported by Council. SAS represents a substantial and rapidly expanding technique in Australia and is encompassed under IUCr.

Possible areas for new Standing Committees might be in areas relating to the representation of SCANZ members' interests in the development and operation of particular classes of instruments at national facilities such as the Australian Synchrotron and OPAL. At present it is not clear to me how users' interests (at a technical level) in, say, the Australian Synchrotron will be

represented on a long-term basis (BAPs are aimed to guide initial instrument development). Possible new Standing Committees could help to give SCANZ a coherent voice in any major funding initiatives that may arise in the future. They would also help to prepare SCANZ for providing input to the inevitable reviews of performance of facilities that will occur down the track and that will be critical to continuation or expansion of funding. They can also initiate and help to hold specialist workshops.

In forming any new Standing Committees, I believe that we should be guided by the overall scope and activities of the IUCr and in particular, the areas covered by Commissions and the major subject areas included at IUCr meetings. In these matters we need to be guided by our Constitution that states that:

*"Standing Committees shall be those whose functions are of a more permanent nature, and shall be listed in the Rules, Section 6, below. These Committees shall report and, if necessary, make recommendations to the Council. While the investigative competences of the Standing Committees are unlimited, they are not to take actions involving the Society funds or prestige, nor use the Society name to solicit funds, nor commit the membership or the officers of the Society to a course of action without the approval of the Council."*

I look forward to receiving any thoughts and proposals that you may have on this subject.

As a start, Council has given endorsement to the establishment of a Small Angle Scattering Standing Committee and Robert Knott (ANSTO) is coordinating this initiative. In case you would like to be involved, his contact details are:

[rbk@ansto.gov.au](mailto:rbk@ansto.gov.au)

Steve Wilkins ( [Steve.Wilkins@csiro.au](mailto:Steve.Wilkins@csiro.au) )

### **Update on the new OPAL neutron scattering facility-Dec 2007 (Vanessa Peterson, ANSTO)**

After the recent shutdown, the OPAL reactor is expected to be restarted early in the new-year, when commissioning activities on the neutron instrumentation will re-commence. Of particular interest to the crystallography community are the neutron instruments Echidna, Wombat, Quokka, and Koala.

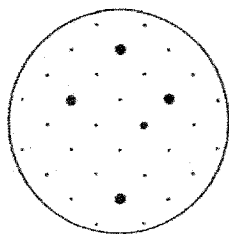
The hot commissioning of the two neutron powder diffractometers (Echidna and Wombat) is almost complete. Wombat, the high-intensity instrument, is capable of 50  $\mu$ s pattern acquisition times and is expected to break new ground in time-resolved studies. Echidna, the high-resolution instrument, is expected to be equal best in the world for a reactor source instrument for peak resolution. The first round of proposals for experiments using these instruments was called and received a large response. The first user experiments have been selected and will be scheduled as soon as operating licenses for the instruments are issued. The second call for proposals is expected after the experiments from the first round begin.

Quokka is the small-angle neutron scattering instrument, of particular relevance to the study of samples with large scale structures (on the order of one to several hundred nanometres) and particularly useful for the study of polymers, biological molecules, precipitates and clusters. Installation of Quokka is complete, with hot commissioning activities to begin early in 2008. Quokka is complemented by our pinhole small-angle X-ray scattering instrument, which will re-commence operation in March, 2008.

Koala is the single-crystal quasi-Laue diffractometer, an instrument that uses a total scattering (white beam) method allowing extremely small ( $0.1 \text{ mm}^3$ ) samples to be analysed. In early 2007, several faults were found in the image-plate diffractometer at the heart of the Koala instrument. The diffractometer was returned to France for repair and has now returned. Re-installation is about to start, with hot commissioning once OPAL restarts.

### **From the Newsletter Editor (Paul Jensen, USyd)**

We hope you're enjoying our first 2008 SCANZ newsletter! There's a wealth of information to bring you up to speed on some recent (OK, maybe some not so recent) and future SCANZ activities. Some of the articles request your input, so if you are able, please make contributions to these. Also included with this mail out are the most recent IUCr newsletters, albeit Volume 15, Number 2 which was dispatched to us but never arrived. These newsletters are also available in electronic format from the IUCr website ([www.iucr.org](http://www.iucr.org)). Some members have enquired about issue 14#1 which is a special (for us!) on crystallography in Australia and New Zealand. Copies of this back issue are on their way to me as I write this and hopefully will arrive in time to be included. If not, these will be sent out with the next SCANZ newsletter. If you have not yet renewed your SCANZ membership subscription (and many of you receiving this have not) please contact our treasurer Bostjan Kobe ([b.kobe@uq.edu.au](mailto:b.kobe@uq.edu.au)) to arrange payment. Please also pass on details to anyone you think will be interested in becoming a SCANZ member (a copy of the membership form is included. Many thanks to all the members who sent in items for this newsletter, and also to student member Miriam-Rose Ash (USyd) for assisting me with this mail out. Future items for inclusion can be emailed to me at [p.jensen@chem.usyd.edu.au](mailto:p.jensen@chem.usyd.edu.au).



**AUSTRALASIAN  
CRYSTALLOGRAPHY  
SCHOOL**

We wish to announce the Inaugural Australasian Crystallographic School:

**July 6-12, 2008  
Melbourne**

The School will cover fundamental and applied aspects of crystallography, and is open to postgraduate students and early career postdocs working in the areas of both small molecule and protein crystallography.

**CALL FOR APPLICATIONS**

Application details and procedures will be announced in the second flyer to be distributed in early 2008. Numbers will be very limited, and applicants will be informed of acceptance or otherwise shortly after applications close.

**COSTS**

Initial registration costs will be \$500. This will cover the course, meals, accommodation and course material. Students may be eligible for a partial refund upon completion.

**FURTHER DETAILS**

Dr. Stuart Batten, School of Chemistry, Monash University 3800.

Tel. (03) 9905 4606.

Email: [stuart.batten@sci.monash.edu.au](mailto:stuart.batten@sci.monash.edu.au)

A/Prof. Matthew Wilce, Biochemistry & Molecular Biology, Monash University 3800.

Tel. (03) 9905 1086.

Email: [matthew.wilce@med.monash.edu.au](mailto:matthew.wilce@med.monash.edu.au)

## SCANZ Treasurer's Report

**21 April 2005 – 02 April 2007**

- Funds currently held by the Treasurer have increased by 7% over the period 21 April 2005 – 02 April 2007.
- No SCANZ meetings occurred during this period.
- \$27,425.00 in travel scholarships was paid during this period. There was a transfer of \$20,000 from the 1987 fund during this period.
- There was a drop in membership from 2005-2006. This may be due to problems with sending subscription reminder forms. In 2007, reminders were sent by email.

### Member numbers

	2005	2006	02-04-2007
Full members	81	63	41
Student members	20	22	26
Life members	22	22	22
Corporate members	1	1	2
Honorary members	2	2	2
<b>Total</b>	<b>126</b>	<b>110</b>	<b>93</b>

### Statement of financial position

	15-03-2005	21-04-2005	04-04-2007
CBA cheque account	8,304.78	7,779.23	9,049.20
CBA term deposit	87,572.00	87,572.00	93,369.50
<b>Total balance</b>	<b>95,877.78</b>	<b>95,351.23</b>	<b>102,418.70</b>

15-03-2005: Date of last Treasurer's report by past Treasurer Paul Carr

21-04-2005: Date of transfer of accounts to current Treasurer Bostjan Kobe

CBA Term Deposit matures 27-04-2007


### Statement of cash flows for the period 21-04-2005 to 02-04-2007

#### Income

Membership fees	3,826.48
Members donations	40.00
Bank interest	3,606.55
Transfer from 1987 Fund	20,000.00
Deposit from Crystal-24	8,000.00
<b>Total income</b>	<b>35,473.03</b>

#### Expenses

Crystal-24 travel support	425.00
IUCr-20 travel support	20,000.00
AsCA Tsukuba travel support	7,000.00
AsCA subscription	720.00
FASTS subscription	810.47
Connect West	49.00
Bank and government fees	200.85
<b>Total expenses</b>	<b>29,205.32</b>



# Society of Crystallographers in Australia and New Zealand SCANZ

(formerly: Society of Crystallographers in Australia (SCA))

## **APPLICATION FOR SCANZ MEMBERSHIP**

Please fill in and mail with cheque to:

SCANZ Treasurer:

Bostjan Kobe (University of Queensland, Qld),

**Tel:** (07) 3365-2132

**Fax:** (07) 3365-4699

**E-mail:** [b.kobe@uq.edu.au](mailto:b.kobe@uq.edu.au)

**Postal Address:** School of Molecular and Microbial Science, University of Queensland, Cooper Road, Brisbane, Qld, 4072 Australia.

**Name:**

(Please print and include formal title e.g. Ms, Mr, Dr, Prof. etc)

_____	_____	_____
Title	Surname	First name and initial

**Mailing address: (business address preferred)**

_____
_____
_____
_____

**E-mail address:**

_____
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**Membership category:**

Regular (\$25)\_\_\_\_ Student (\$7)\_\_\_\_ Corporate (\$130)\_\_\_\_

These amounts are reduced to \$20, \$5 and \$100, respectively, if paid by April 1. Membership is on a calendar year basis. Applications received after June 30 will apply for the following year unless otherwise requested.

Therefore, to join the Society the appropriate fees are \$20, \$5 or \$100, respectively.

## Sponsors

Two current members of the Society must sponsor the application. Please write to the Secretary if you do not know any sponsors.

SCANZ Secretary:

Stuart Batten (Monash Univ. Victoria),

Tel: +61 (3) 9905-4606 Fax: +61 (3) 9905-4597

E-mail: [Stuart.Batten@monash.edu.au](mailto:Stuart.Batten@monash.edu.au)

Postal Address: Monash University, Clayton, VIC 3800, Australia

Sponsor 1

Sponsor 2

Name (please print) \_\_\_\_\_

Signature \_\_\_\_\_

## Student certification

If requesting student membership, please complete the following and have it certified by a Faculty member of your institution.

The applicant is known to me and is a bone fide student at:

\_\_\_\_\_  
\_\_\_\_\_

For the current academic year \_\_\_\_\_

Faculty member \_\_\_\_\_  
Name Signature

## Special interests

Please indicate your major fields of interest. Students should indicate the degree or diploma sought and the name of their research supervisor if appropriate.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Payment

I enclose \$\_\_\_\_\_ for membership for the year \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_



# Society of Crystallographers in Australia and New Zealand

## Office bearers

- President:** Stephen Wilkins (CSIRO Manufacturing and Mater. Tech., Vic)  
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A.W. Stevenson (CSIRO Manufacturing Science)  
T.R. Welberry (RSC, ANU)
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