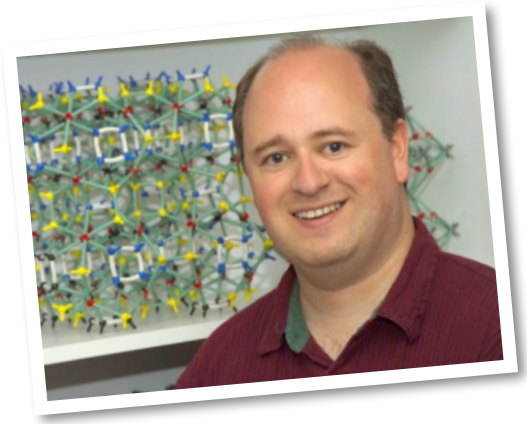
# NEWSLETTER

## Society of Crystallographers in Australia and New Zealand



## From the President

I feel honoured and not a little daunted by taking over the Presidency of SCANZ in this, the International Year of Crystallography. SCANZ has a long and proud history of supporting crystallography in the region, and this is a once-in-a-lifetime opportunity for us all, as both a society and as individuals, to get out there and promote what we do. I hope we are all up to the challenge, and certainly there is a very impressive program of activities that have already been put in place, ranging from crystal growing competitions for schools, already underway, through public sculptures and crystal structure blogs, and all the way to the Science at the Shine Dome event in May 2015. One certainly couldn't accuse us of not getting the most out of the occasion, given that our celebrations arguably started with the Bragg Centennial meeting in December 2012 – that's two and a half years of events out of a single year!

http://scanz.iucr.org/

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## We are:

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|---|---|
| **Immediate Past President:** | Bostjan Kobe (b.kobe@uq.edu.au) |
| **President:** | Stuart Batten (stuart.batten@monash.edu) |
| **Vice-President:** | Alice Vrielink (alice.vrielink@uwa.edu.au) |
| **Secretary:** | Chris Ling (c.ling@chem.usyd.edu.au) |
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| | Jenny Martin (j.martin@imb.uq.edu.au) |

## From the President

Speaking of meetings, I should also congratulate Bostjan, Jenny and their team on the great success of Crystal 29. A fantastic location, a great lineup of speakers, and a good time was had by all. Congratulations also to our two medal winners, Syd Hall and Marc Kvansakul, two very worthy recipients. For those looking forward to the next Crystal meeting, it will be hosted by Victoria, with WA likely to host the following meeting. Nothing has been put in place yet, but we're looking closely at the possibility of holding the meeting in Tasmania, with Easter 2016 the likely date (to avoid clashing with the Kolkata AsCA meeting in December 2015). But stay tuned for further details as we get closer to the day.

SCANZ also has a number of other challenges ahead, which we have been steadily addressing, and will continue to do so over the coming term. We now have a new website, and I urge everyone to sign up to the SCANZ-Info mailing list therein. This will allow greater discussion *between* members, while allowing the Council to still contact members directly as needed from time to time. The constitution has been extensively revised to bring it into the 21st century, to reflect better how the society runs, and to reflect recent and previous changes approved but never written into the official constitution. These will be mailed out to all current financial members in the near future (yes, by snail mail!); I hope you will all support these changes by voting, and voting in favour. There are also a number of other changes we are looking at to improve the way SCANZ runs, including (but not limited to) changes to the way we manage membership records, mailing lists and fee payments; all I can say for the moment is watch this space!

Finally, it just remains for me to thank the outgoing members of the Exec and Council, starting with Bostjan Kobe, who leaves the Presidency (but not the Council) with a significant legacy of changes and an IYCr program with a full head of steam. I also thank Alison Edwards for her two terms as Treasurer, and particularly for her hard work around the very significant undertaking that the Bragg Centennial/AsCA/Crystal meeting represented, and Ray Withers, who is replaced by Bostjan as Past President and thus also comes off the Council after having first joined in 2003! This means, of course, that we have a new Vice-President (Alice Vrielink) and Treasurer (David Aragao), both of who I know will bring a fresh perspective on the challenges ahead.

**Stuart Batten**

## Past President's Report

It has been a great pleasure serving as SCANZ President during the period that involved the preparations for the International Year of Crystallography (IYCr), and culminating in the Crystal29 Conference at O'Reilly's in Queensland.

I am very happy that we got a number of IYCr projects well off the ground. The different activities are listed in the IYCr Report, and here I would just like to thank the numerous people I interacted with on that topic, over the last year or two, and in particular the people who agreed to organize different activities or contribute in different ways, including Jenny Martin, Helen Maynard-Casely, Neeraj Sharma, Jenny Jones, Stuart Batten, Chris Ling, Janet Newman, Jack Clegg, Brett Collins, Alice Vrielink, and Polly Agrawal from the Australian Academy of Science who has helped coordinate it all. This is not an exhaustive list, thanks everyone else who has donated time to make IYCr projects happen, and in particular those who came up with ideas without even having to be prompted.

I am also very pleased everyone seemed to have enjoyed the Crystal29 Conference, and I certainly have enjoyed all aspects from the program to the beautiful setting. What really convinced me that the conference was a success is seeing a full room of people at the end of the last talk of the conference, and a number of them engaged in a deep discussion on thermodynamics in the question period even when lunch and buses were waiting in front of the venue.

Among other important things that happened during my tenure as President that definitely need a mention is the new SCANZ website, courtesy of Charlie Bond. It remains work in progress and feedback is very welcome, but everyone agrees it is a great step forward, thanks Charlie. Another of Charlie's contributions is the SCANZ-Info mailing list, please follow the instructions on the SCANZ website to join it if you haven't yet, the more members participants the more useful it will be. And thanks Stuart Batten for all the efforts on updating the SCANZ constitution, looks like we are almost there finally.

One area that will need to be addressed in the next few years is SCANZ membership. Our Society has significant overlap with a number of other societies, which capture many researchers involved in powder diffraction, electron microscopy, macromolecular crystallography and chemical crystallography, to name just a few areas. Perhaps joint or back-to-back conferences, as well as joint memberships will help attract more crystallographers to SCANZ. We are in an era where nobody is just a crystallographer any more, and I do not see any problem embracing this and SCANZ complementing what some of these other societies might offer to researchers.

**Bostjan Kobe**

## Meeting Report Crystal 29

### Apr 22-25, 2014

The 29th meeting of the Society of Crystallographers in Australia and New Zealand was held at the Lost World Conference Centre, O'Reilly's Rainforest Retreat Lamington National Park in Queensland from April 22-25th, 2014. Over 100 delegates attended, including ~10 exhibitors and sponsors. This year a conference speaker policy was trialled that set out specific goals for selecting high quality speakers that reflected the diversity of our community. Anyone invited to speak at any of the last 3 meetings was not eligible for an invitation at this meeting (although could be selected from submitted abstracts). The aim was to refresh the meeting, and to highlight the breadth of emerging talent in our field. By all accounts the conference was a resounding success. Comments from delegates included "I don't think that I have been to a similar conference with such consistently high quality presentations", "The range of talks was excellent, I like the policy employed to select speakers", "A huge success", "I enjoyed the programme immensely". We propose SCANZ adopts this conference speaker policy permanently for Crystal meetings and to require a similar policy for any conferences, schools, or symposia that SCANZ is asked to support with funding.

Speaker diversity data for Crystal29 are available at http://www.crystal29.com/conference-policy/. The program and abstracts can be found at http://www.crystal29.com/conference-program/.

The program included 59 speakers and 31 posters. The speakers included 4 keynote speakers: Jo Etheridge, Monash University; Andrew Goodwin, Oxford University; Alice Vrielink, University of Western Australia (UWA); and Vic Arcus, University of Waikato; two SCANZ medallists - Mathieson Medal: Marc Kvansakul, La Trobe University; Bragg Medal: Syd Hall, UWA; 6 Rising Star Awardees: Jason Busby, University of Auckland; Josie Aickett, University of Sydney; Alastair Stewart, Victor Chang Cardiac Research Institute; Sophie Broughton, St. Vincent's Institute of Medical Research, Melbourne; Thomas Ve, University of Queensland (UQ); and Sajesh Thomas, UWA. The 1987 speaker was Petra Fromme, from the Arizona State University in Phoenix, who gave an inspirational presentation on the ground-breaking technology of serial femtosecond nano-crystallography.

Social events on the first night included a welcome reception with sunset drinks at the Moonlight Crag, followed by an animal encounter (quoll and carpet python!), history of O'Reilly's by Shane O'Reilly and a yummy Aussie barbecue. Afterwards, delegates were able to view and vote for 25 shortlisted entries for the Australian satellite of the International Year of Crystallography (IYCr) photo competition, "Crystallography in Everyday Life". We are very grateful to Julia Archbold and Patricia Walden from UQ for running the photo competition. Please see the IYCr report in this Newsletter for details and outcomes of the photo competition.

*Syd Hall receiving the Lawrence Bragg Medal from Bostjan Kobe.*

The second night of the conference program was set aside for the poster presentations, preceded by a pizza and pasta event at the O'Reilly's Retreat Lodge. Roisin McMahon and Patricia Walden are warmly thanked for arranging the poster session and providing required information and material to the poster judges.

*Mark Kvansakul receiving the Sandy Mathieson Medal from Bostjan Kobe*

The final night of the conference program was marked by the conference dinner at the Mountain Cafe, which included announcement of the poster and Rising Star awards.

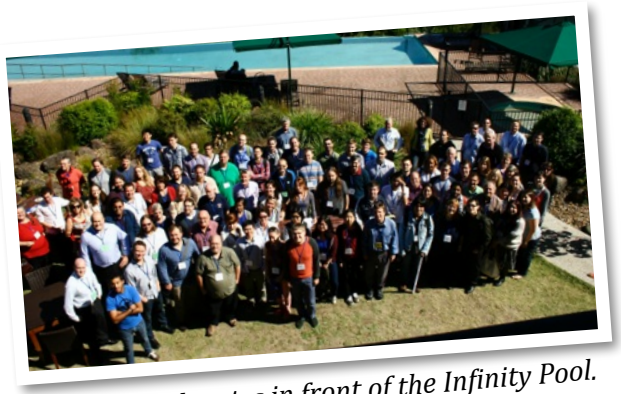
Poster prizes of $200 were awarded to 6 student poster presenters by a panel of 10 judges. Faculty of 1000 (F1000) winners (who also received F1000 access for 1 year) were Jason Brouwer and Michael Roy from the Walter and Eliza Hall Institute of Medical Research (WEHI) and Lachlan Casey from UQ. The ChemEngComm book poster prize was awarded to Angus Cowan from WEHI. The ChemEngComm subscription poster prize was awarded to Melina Nematirad from Monash. The SCANZ poster prize was awarded to Xiaoxiao Zhang from UQ.

Many delegates also took the opportunity during the conference for a spot of bushwalking or bird-watching - as well as swimming in the infinity pool - in the beautiful Lamington National Park. We thank the poster judges and rising star judges, the organising committee, the program committee, the speakers, the poster presenters, Sally Brown and her team at Conference Connections, and all those who helped make this a remarkable Crystal meeting.

**Jenny Martin and Bostjan Kobe**

*Poster prize winners and past and present SCANZ Presidents; from left: Bostjan Kobe, Xiaoxiao Zhang, Jason Brouwer, Michael Roy, Lachlan Casey, Angus Cowan, Melina Nematirad, Stuart Batten*

*Rising Stars; from left: Sajesh Thomas, Sophie Broughton, Thomas Ve, Alastair Stewart, Jason Busby, Josie Aickett*



*Crystal29 delegates in front of the Infinity Pool.*

***All photos courtesy of Patricia Walden***

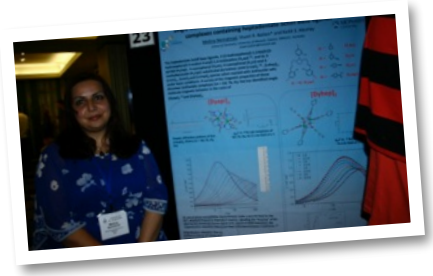
## AsCA 13, Maslen Scholarship Reports

It was an invaluable opportunity for me to be awarded the Maslen Scholarship to attend the Crystal 29 conference in Lamington National Park in Gold Coast, Queensland. The conference was held in one of the most serene and relaxing environments in Australia, with many natural attractions, and was well organised to accommodate a vast variety of scientists who brought the wealth and depth of their knowledge to share with others.

The keynote lecturers were thoughtfully selected with the goal of introducing the broad spectrum of crystallography from theoretical aspects to detailed experiments, from small molecule chemistry to huge proteins and in between with practical applications. I especially enjoyed the keynote talk given by Dr. Andrew Goodwin about ''Crystallography without crystals: order within disorder'' which was highly inspirational and helped me to look at crystallography in a new light.

One of the highlights of the conference was the photography competition where the creativity met the scientific understanding of crystal structures and resulted in production of some artistic pictures. Also, at the poster session of the conference, space was given to students to discuss with and learn from prominent scientists who willingly shared their valuable experiences with us, that gave me the chance to present a poster on single molecule magnets which is part of my PhD research project.

The opportunity created by the welcoming dinner and conference dinner to meet other students and researchers and build new friendships and enhance the existing ones will always be appreciated by post-graduate students like me.



Attending Crystal 29 inspired and encouraged my enthusiasm in continuing the path of learning with a humble attitude when there is so much to learn and understand. It is my sincere wish to thank the SCANZ committee for such a precious learning experience, I would also like to extend my gratitude to the organizing committee members.

*Melina Nematirad*
*Monash University*

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The picturesque rainforest of Lamington National Park was a fantastic location for the 29th Biennial Conference of the Society of Crystallographers in Australia and New Zealand (Crystal 29). Beautiful sunsets, Barney the quoll and the oldest tree top walk in Australia were highlights of the conference venue, O'Reilly's Rainforest Retreat.

There were some excellent talks on hot structures and emerging techniques from invited speakers, both local and from overseas. As a protein crystallographer, I particularly enjoyed Petra Fromme's talk on the study of membrane proteins using XFELs. The possibilities and challenges presented by femtosecond crystallography are very interesting.

The rising star session showcased some exciting work from Australia and New Zealand. Jason Busby's incredible structure of the BC component of ABC toxins and the mechanism of delivery was fascinating. Alastair Stewart gave a powerful example of the all-important link between structure and function in the unique properties of the right-handed coiled-coil of the stator stalks of rotary ATPases.

Bragg Medalist Syd Hall provided some funny anecdotes about the history of crystallography in Australia and the marathon car journeys he undertook with his supervisor Ted Maslen to get to the early SCANZ conferences. I was honoured to receive a poster prize at the conference and would like to thank the conference organisers for a great introduction to the Society. I would also like to sincerely thank SCANZ for the Maslen scholarship that allowed me to attend the conference.

*Angus Cowan*
*Walter and Eliza Hall Institute*

## AsCA 13, Maslen Scholarship Reports

It was a privilege to have been awarded a Maslen Schloarship to attend the recent CRYSTAL 29 meeting, the 29th Biennial Conference of SCANZ, which was held at the O'Reilly's Rainforest Retreat in the Lamington National Park in Queensland.

CRYSTAL29 was an excellent meeting, offering perspectives both on the history, current practice and future of crystallography. With breathtaking views over valleys and mountain ranges, Lamingtons at morning tea and reference to the endemic blue Lamington Crayfish, the sense of location could not have been more complete. It was a fantastic setting for engaging with some high quality science.

The Bragg Medal lecture given by Syd Hall was a particular standout. Syd's vivid reflections* on a remarkable career to date in crystallography, were amongst other things a good reminder particularly for the younger members of the audience of the dramatic changes that rapid advances in computing power have had on crystallographic analysis (eg. what might have been a 10 year calculation in 1955 might now be completed in less that 0.5 seconds) and of the need to correctly retain and store our primary data for analysis by future generations.

We heard about developing techniques to approach extracting useful structural information from disordered materials from Andrew Goodwin. Petra Fromme gave a glimpse into the exciting future offered by X-ray Free–Electron Lasers (XFEL) sources, including the tantalizing possibilities of atomic resolution femtosecond molecular movies and serial femtosecond crystallography of membrane proteins injected directly from lipidic cubic phase (LCP). Two very interesting examples of understanding protein conformational flexibility and dynamism in function were Hartmut Luecke's presentation of the structure of the acid–gated urea channel from Helicobacter pylori and Nyssa Drinkwater's presentation on her work trapping dynamically sampled conformational states of the human IgE-Fc. All of the speakers in the Rising Star Plenary Session gave outstanding presentations (Jason Busby, Josie Auckett, Alastair Stewart, Sophie Broughton and Thomas Ve) and I also really enjoyed talks by Roisin McMahon and Khuchtumur Bum-Erdene.

I would like to thank the Conference organisers for an outstanding job and once again thank SCANZ for awarding me a Maslen Scholarship. The conference was an excellent opportunity to share knowledge and meet colleagues within the field, and a fitting way to celebrate this International Year of Crystallography.

*Michael Roy*
*Walter and Eliza Hall Institute*

*pun purely unintentional

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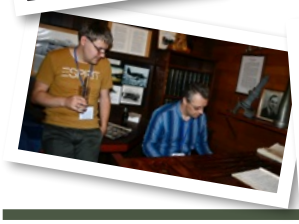
Lamington National Park set a serene stage for the SCANZ Crystal29 conference. Some fantastic talks were intervened by spectacular views and canopy walks.

Bragg Medalist Sydney Hall delivered a memorable lecture, which provided some insight into the scale of his contribution to the field of crystallography. His progression of the computational analysis, storage and preservation of data placed him as a very worthy medalist. Airlie McCoy, the inventor of PHASER, gave an insightful lecture into the power of molecular replacement and the ability to use small fragments of proteins to solve the phase problem.

The conference saved some of the best for last, with rising stars Jason Busby and Alastair Stewart delivering some amazing new structures that would get any protein crystallographer excited. The final lecture by Vic Arcus was fitting for such a naturally beautiful setting, presenting his interesting work linking crystallography and climate change.

I would like to thank SCANZ for awarding me a Maslen Scholarship to travel to this amazing place for a great conference not soon forgotten.

*Jason Brouwer*
*Walter and Eliza Hall Institute*



## International Year of Crystallography Update

As hopefully everyone is aware, 2014 is the International Year of Crystallography (IYCr; www.iycr2014.org) and to celebrate it, a number of activities have been planned around Australia, coordinated by SCANZ and the National Committee for Crystallography. The celebrations in Australia started already in 2012 in Adelaide with the Joint Meeting of the Asian Crystallographic Association (AsCA), SCANZ (Crystal28) and the Bragg Symposium. A more recent event, which took place during the Crystal29 Conference, was the Australian satellite of the IYCr "Crystallography in Everyday Life" photo competition, which was held on 22 April at O'Reilly's Rainforest Retreat in Lamington National Park in Queensland. Over 130 images submitted from around the world were shortlisted to 25 images by a selection committee, and these were displayed on poster boards at the conference mixer. Conference delegates were asked to select their favourite images. The winner of the competition was Graziano Lolli from Italy for his image "Romanesco broccoli" (see photo, coutesy of Patricia Walden). This event was organised with the assistance of Poulomi Agrawal (AAS), Michele Zema (IYCr), Julia Archbold, Patricia Walden and Jenny Martin (all from the University of Queensland (UQ)) in collaboration with the International Union of Crystallography (IUCr) and Agilent Technologies (Oliver Presly), and the prize of $500 was sponsored by the Crystal29 conference. Selected images will be shown publicly at venues around Australia.

At the Crystal29 Conference, we also heard first-hand from several other coordinators of these activities. One that is well underway is the Crystallography365 (http://crystallography365.wordpress.com/) project involving blogging a different crystal structure each day in 2014. The coordinator Helen Maynard-Casely (ANSTO) together with Neeraj Sharma (University of New South Wales) updated us on this and the Crystals in the City sculpture exhibition project, which has overcome a number of technical and funding issues and is also well underway. Chris Ling (University of Sydney) told us about his exhibition of smaller crystallography-related objects at the University of Sydney Verge Gallery. Another large activity that is taking place is the National Crystal Growing Competition (coordinated by Jennifer Jones, University of Sydney with the Royal Australian Chemical Institute). Other projects at earlier stages of preparation are the public display of remote data collection at the Australian Synchrotron (planned by Brett Collins, UQ); Explore the Crystals citizen science crystallization drop evaluation (planned by Janet Newman, CSIRO), and a number of special journal issues, public seminar series and sessions at scientific meetings, both in Australia and New Zealand.

The Australian celebrations will culminate with "Minerals to Medicines" Science at the Shine Dome event on 28 May 2015, which will explore the impact of crystallography, including the prospect of crystallography without crystals.

**Bostjan Kobe and Jenny Martin**

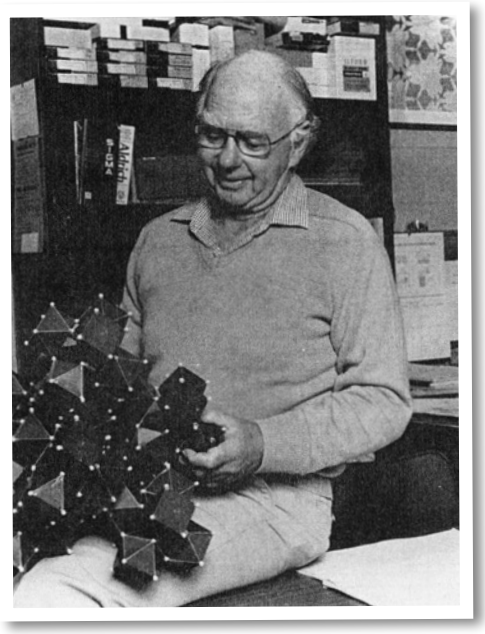

*Judging of the "Crystallography in Everyday Life" photo competition at Crystal 29*

TRIBUTE

# David John Martin (Judge) Bevan

(7th January 1926 - 15th May 2014)

*by Allan Pring*



Professor D.J.M. Bevan, known universally as "Judge", was Professor of Chemistry at Flinders from 1968 until 1983, when he took early retirement due to heart trouble. In his time as Head of Department, he built thriving School for teaching and research in Chemistry. Born in Melbourne and educated at the University of Melbourne, he graduated with a BSc in 1946 and MSc in 1949. The University of Melbourne was a particular centre for Chemistry at that time and his immediate classmates included at least three other notable future Professors of Inorganic Chemistry: Norman Greenwood (Leeds), Ray Martin (ANU, and Monash) and Tom O'Donnell (Melbourne). After completing his MSc Judge followed his great mentor, J.S. Anderson to the Atomic Energy Research Establishment at Harwell UK, where he worked as a junior research fellow. He completed a Ph.D. at Imperial College London in 1957 and returned to Australia to the University of Western Australia as Senior Lecturer in Chemistry, before moving to Flinders.

Judge's research area was the solid state chemistry of rare earth oxides, which form very complex defect structures and can be used to store oxygen in the solid state. An area of research, which to this day, is still very difficult to study. Judge made major contributions to the field, by careful measurements using simple equipment and ingenious experimental design. His scientific papers were marked by a clarity of prose, for Judge set great store in being able to express your results and idea's clearly. Although, by the standards of today's publish or perish, Judge did not publish a great number of papers, around 70 in total, but they are still widely cited today, some more than 50 years after they were first published. After his early retirement, Judge continued to work and publish on oxide chemistry and his last paper was published in 2013, co-authored with his lifelong friend Ray Martin, on the structure of complex metal oxides.

Judge died peacefully at home, having enjoyed a long happy and productive life. His was a life well lived.