

# NEWSLETTER

## Society of Crystallographers in Australia and New Zealand

### SCANZ PRESIDENT'S REPORT



A belated welcome to 2022. Consistent with the last 2-3 years, 2022 has had a rather tumultuous start. SCANZ extends its support to those of our members impacted by recent natural disasters including the fires in WA and the floods in QLD and NSW. Our international colleagues who are impacted by the conflict in Europe are also in our thoughts.

There have been a lot of exciting activities within the Society over the last months. The Council have welcomed Kurt Krause (University of Otago) as our New Zealand representative. We have had a lot of discussion since I took over as President around mechanisms by which we might increase engagement and participation with our New Zealand colleagues. Thank-you to Kurt for agreeing to contribute and we look forward to working together.

As mentioned in the last Newsletter, to increase the opportunities for recognition for our early-mid career researchers the Council have moved to award the Mathieson Medal on an annual basis. I am delighted therefore to announce that the 2021 Awardee is Professor Colin Jackson (ANU, see profile below). Colin will receive his award and present his research at the Crystal 34 meeting. Another round of Mathieson Medal applications and nominations for the Bragg Medal will open later this year, ahead of the Crystal 34 meeting. Please keep an eye out for those announcements.

On the subject of meetings, this year will be busy and exciting. The inaugural SCANZ ECR meeting 'Crystal Lite' will be held at the Bio21 (University of Melbourne) from 19<sup>th</sup>-20<sup>th</sup> May (see announcement below). Thank-you to the co-chairs Helen Maynard-Casely, Michelle Miller and their organising committee for their hard work in putting together this wonderful initiative. I look forward to hearing about all the wonderful science and engagement that I am sure will take place.



<http://scanz.iucr.org/>

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I am also very pleased to announce that the Crystal 34 meeting will take place in Bendigo (at the La Trobe Bendigo campus) between 6<sup>th</sup>-9<sup>th</sup> December, 2022. Please save the dates in your diaries. We expect the conference web site to be active at the end of April with all details regarding venue, accommodation, abstract submission etc.

Substantial progress is also being made toward the organisation of the IUCr 2023 (<https://iucr2023.org/>). The International Program Committee will meet at the end of April and the recent meetings of the Local Organising Committee have reflected a hive of activity on all aspects of the conference organisation. Please see below for an update from Michael Parker, Chair of the conference.

Finally, the Council has been approached by Rod Hill, who has offered to write a book on the history of SCANZ (SCA, Bush Crystallographers). There will be more detail to follow in future newsletters. In the meantime, Rod asks if the SCANZ community can give some thought as to whether they might hold records, photographs or other memorabilia that would be useful in researching the book. If you do, please contact Rod directly: [rod@rodhill.com.au](mailto:rod@rodhill.com.au).

Megan Maher - SCANZ President



We are excited to announce that the first SCANZ Early Career researchers meeting, Crystal-Lite, will be held **19th-20th May 2022** at the Bio21 Auditorium in Melbourne. All (not just ECRs!) are welcome to attend. This will be our first in-person meeting since before the pandemic so we would love to see as many of you as possible. We are running it as a hybrid event and a virtual stream will be available.

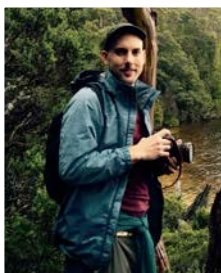
Abstract submission is now [open](#) - everyone from undergrad and current PhD students to Postdocs less than 5 years from conferral are welcome to submit to present. Short talks will be selected from submitted abstracts.

Finances are available for ECRs travelling from NZ or WA: contact [events@scanz.org](mailto:events@scanz.org) by the 27th April.

Registration is free for all SCANZ members.

## Invited Speakers

**Rhys Grinter**  
*Monash University*  
Bacterial resistance  
and iron piracy.



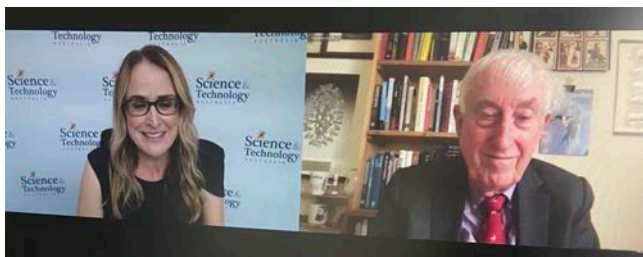
**Carol Hua**  
*Deakin University*  
Chiral coordination  
polymers.



## SCIENCE MEETS PARLIAMENT 2022

Science meets Parliament (SmP) is an annual event run by Science & Technology Australia (STA) that has the aim of connecting the STEM sector with policy makers. This year it was held as a virtual event, with workshops and discussions between the 28<sup>th</sup> of February and 4<sup>th</sup> of March. The virtual format worked very well and has made SmP accessible to more people as there were over 500 participants this year.

The first day began with a Welcome to Country from Ngunawal Elder, Uncle Wally Bell, who urged us to show respect for country and each other. The Science Minister Melissa Price MP and Shadow Science Minister Richard Marles MP then officially welcomed us to the event. For me, a highlight of the day was hearing from a national treasure, Nobel Laureate Professor Peter Doherty, who encouraged us to engage respectfully with people who have different views from our own. Professor Doherty also stressed the importance of creating more opportunities for early career scientists and to do that “we have to be prepared to change things”. His final piece of advice to scientists was to



*Laureate Prof. Peter Doherty in conversation with STA CEO Misha Schubert*

“have a strong sense of self and what you think is important”.

Throughout the week there were panel discussions on a variety of topics, such as practicing our pitch, advocating with impact, Indigenous STEM, health equity and commercialisation. These discussions highlighted the importance of communicating with people and gave insight into how to do this effectively. The conversation between Brian Cox and Kirsten Banks about science communication was inspiring and they spoke about the need for universities and institutes to truly value science outreach and communication work. On Wednesday the 2<sup>nd</sup> of March, STA president Professor Mark Hutchinson gave the National Press Club Address, where he talked about the need to train people in the skills required to take research from “bench to boardroom” but also emphasised the importance of fundamental research, as this feeds into the commercialisation and translation process.



*Kirsten Banks and Brian Cox talk science communication.*

The following week, I was fortunate to meet with Mr Andrew Wilkie MP, Independent Member for Clark, Tasmania. Mr Wilkie was very generous with his time and spoke to us for 45 minutes. We discussed the need for fundamental research and the uncertainty facing researchers, particularly those early in their careers. I brought issues with the ARC grants system to his attention and explained the small things that could be changed to improve researchers’ lives. Mr Wilkie’s genuine interest was heartening, and he encouraged all of us to talk more with our local politicians.

Finally, I would like to thank SCANZ for sponsoring my attendance at this event and my supervisor Dr Alastair Stewart for his encouragement to attend. Overall, I found SmP a very grounding experience. It was inspiring to be exposed to people who are making positive societal changes and the event left me thinking about how I can have impact beyond my publication metrics.

Emily Furlong



Our IUCr 2023 Congress and General Assembly is only 495 days away! Our meeting will celebrate another important event: it will be the 75<sup>th</sup> anniversary of the very first IUCr General Assembly that was held at Harvard in 1948! Our meeting is not to be missed!

One of the most important milestones in the run up to the meeting is the selection of plenary and keynote speakers together with microsymposium topics and chairs. This task is performed by our International Program Committee, chaired by Brendan Kennedy and Megan Maher, and consisting of delegates chosen by the 21 of the IUCr commissions. The meeting will be held on April 21-22, in Melbourne and Prague with those delegates not able to attend in person doing so virtually. We have also made a call for workshops that will precede the meeting (<https://iucr2023.org/call-for-workshops/>).

Call to Action	Date
Call for Abstracts Open	23 Aug 2022
Call for Abstracts Close	21 Nov 2022
Notifications of Abstract Acceptance	1 Feb 2023
Early Bird Registration Deadline	15 Feb 2023
IUCr 2023 Pre-Congress Workshops	21-22 Aug 2023
IUCr 2023 Congress	23-29 Aug 2023

The IUCr 2023 local organising committee consists of Michael Parker (Chair, University of Melbourne and St. Vincent’s Institute), David Aragao (Diamond Synchrotron), Stuart Batten (Monash University), Melissa Call (WEHI), Daniel Eriksson (ANSTO), Brendan Kennedy (University of Sydney), Helen Maynard-Casely (ANSTO), Megan Maher (University of Melbourne) and Tom Peat (CSIRO). We have expanded our committee to include Emily Parker (Victoria University of Wellington, New Zealand), Jack Clegg (University of Queensland) and Charlie Bond (University of Western Australia).



We are ably supported by our professional conference organiser, ICMS Australasia, who are providing valuable support and advice to us.

On the marketing front we have recently published our second [E-zine](#) where you will find a lot more details about the conference and also about Australia!

We are very happy to receive suggestions on how to make our meeting the best it can be and for volunteers to help us out with our planning. Please contact the IUCr 2023 LOC through its Chair, Michael Parker ([mparker@svi.edu.au](mailto:mparker@svi.edu.au)). And finally, we will continue to provide updates via our website ([www.iucr2023.org](http://www.iucr2023.org)) and social media (@IUCr2023). And you can lodge an expression of interest via our website to keep up with the latest news via email.

## SPOTLIGHT ON PROFESSOR VANESSA PETERSON



The SCANZ community extends its heartfelt congratulations to Professor Vanessa Peterson (ACNS) for being awarded the 2022 Nancy Millis Medal for Women in Science!

### *Nancy Millis Medal*

The Nancy Millis Medal of the Australian Academy of Science honours the scientific contributions made by the late Professor Nancy Millis. It recognises her importance as a role model for women aspiring to be research leaders. It is awarded to a female researcher who is eight to fifteen years post-PhD in any branch of the physical or biological sciences.

Professor Vanessa Peterson is a Senior Principal Research and Neutron Instrument Scientist at the Australian Centre for Neutron Scattering (ACNS). She leads Energy Materials research and holds an Honorary Professorial Fellowship with the University of Wollongong.

Following a PhD (2004) from UTS, Vanessa worked in the US at the National Institute of Standards and Technology's Center for Neutron Research and the University of Maryland before moving back to Australia to the University of Sydney, joining the ACNS in 2007.

Vanessa holds roles with the IUCr, the International Union of Pure and Applied Chemistry, Oak Ridge National Laboratory, the Australian X-ray Analytical Association (AXAA), and several roles including Director-at-Large of the International Centre for Diffraction Data. Vanessa is a Fellow of the Royal Society of Chemistry and the Royal Australian Chemical Institute.

Vanessa was the first woman to receive the AXAA Bob Cheary Award for Excellence in Diffraction Analysis (2020), the Australian Neutron Beam Users Group Neutron Award (2019), and the Society for Crystallographers in Australia and New Zealand's Sandy Mathieson Medal (2017). She has a NSW Australian Institute of Policy and Science Young Tall Poppy Award (2013) and was a finalist for the Australian Eureka People's Choice Award (2011).

### **Professor Peterson, could you provide us with a summary of your current research?**

I work in materials characterisation, specialising in neutron scattering methods. My current research targets functional materials at the heart of energy technology such as batteries and fuel cells, as well as materials used for the separation and storage of energy relevant gases including hydrogen and carbon dioxide. I use a range of neutron and X-ray characterisation tools to understand the origin of a material's function, and to identify performance bottlenecks in these technologies. This understanding is then used to strategically direct the development of higher performance materials and devices. The research leverages my role as a neutron scattering instrument scientist, where I develop approaches and methods to characterise the function of materials, yielding detailed information about how the arrangement and motions of atoms can be harnessed to make new and better sustainable-energy devices.

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**Nancy Millis** (1922-2012). *BAGSc (1945), MAgSc (1946), UniMelb. PhD (1952) Bristol. DSc (Hon) (1993) UniMelb AC MBE FAA FTSE.*

Prof. Nancy Millis was an Australian microbiologist specialising in fermentation. She created the first applied microbiology course to be taught in an Australian university, working to link universities with industry. She helped set up the Recombinant DNA Monitoring Committee in 1980, which was the precursor to Gene Technology Technical Advisory Committee. There is a great interview with her from 2002:

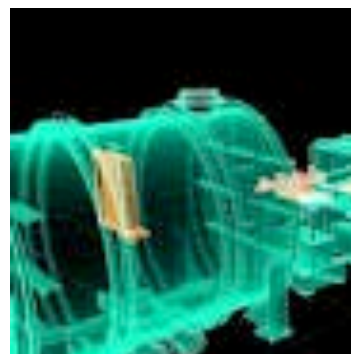
<https://www.science.org.au/learning/general-audience/history/interviews-australian-scientists/professor-nancy-millis>

### **What role does crystallography play in your research?**

As with many of the functional materials I study, the material's response to external stimuli that simulate application conditions, can often be characterised by changes to atomic order, leading to modifications in the long-range, periodic structure. For energy materials, understanding the crystal structure of a material and how it changes during use in application, is the core aim of this research. Functional materials at the heart of energy systems, such as rechargeable batteries, undergo change during use. For example, the concentration of charge-balancing ions in an electrode within a rechargeable battery (such as a commercial lithium-ion battery) changes continuously over a wide range during charge and discharge of the battery. The electrode must accommodate this change, and crystallography enables this to be understood in terms of the electrode material's crystal structure.

### **What's the biggest challenge you've faced in your career so far, and how did you overcome it?**

Learning how to lead research. There are a lot of challenges here that arise from stereotyping of my role, based around my gender and working at a large-scale facility rather than in a University environment. There is immense value in diversifying the ways that we perform research. It is inherently more challenging to lead research in a way outside the normal model, which is predominantly by University-based, male researchers. Bringing together expertise in neutron scattering and other specialist characterisation tools available at facilities where I work with materials expertise is an impactful way to realise the benefits of materials characterisation capabilities. While many of my achievements are in partnership with University based collaborators, the challenge was to be recognised as a leader and for my contributions and role in the research to be recognised and valued. This was the biggest challenge I have faced - convincing people that research can be done in this way. I overcame this by demonstrating (often to myself) that this model works, and with every successful project this became easier. Respect is earned, and I now have the respect of my peers regarding the way that I engage in research. Ultimately, we can only control what WE do, but if we are successful in doing something then others will come along for the journey, and together we can change the status quo. In overcoming these challenges I hope to act as a role model to other women and scientists from facilities, who also strive to lead research from non-traditional backgrounds.



### **What do you love best about research?**

Explaining things! I work a lot in understanding the origin of materials function and I find it deeply satisfying to be able to uncover how things work in great detail, and then apply that knowledge to help improve function. This explanation can range from describing my research outcomes to school children or members of the public, to presenting brand new discoveries to large-scale international conferences. I love the whole gamut of informing people about the great work we have done and how it may impact them through the technologies of the future.

I particularly love working with graduate researchers on their projects. The only thing better than working something out is when an early career researcher works it out with me! PhD projects are a unique opportunity to really dig into a topic and gain deep understanding over a sustained period, and I love guiding early career researchers on that journey.

### **Do you have a piece of advice for female early career scientists interested in a career in research?**

Have conversations at the start of projects and with collaborators about your expectation of contribution and recognition for this. It is never too early to talk about your expectations of co-authorship and related recognition for contribution. Things are likely to change as the work progresses but setting expectations upfront will both make it easier to get recognition for your work as well as for your contributions to be valued. Highlighting your role in work opens opportunities for advancing your career and negates the possibility for others to take credit for your inputs.

I have valued the input of several mentors during tricky points in my life during my career, and I found that having an external perspective of challenging situations has helped me navigate through these difficult situations.

### What is the highlight of your career so far?

Performing real-time scattering measurements of materials undergoing change and then explaining what the variation in the measured scattering means in terms of the sample and system being studied. I am proud of building that understanding for battery materials to a point where tiny variations in neutron scattering intensity can be attributed to the deformation of metal oxygen polyhedra in an electrode material within a whole battery while that battery is being cycled. There was a perception that diffraction measurements are only valid for systems that are at equilibrium, and I am proud of my persistence to extend the consideration of all measurements as a time average to systems not at equilibrium, but undergoing change.

## CONGRATULATIONS TO OUR AWARD RECIPIENTS!

The Sandy Mathieson Medal is awarded for distinguished contributions to science involving X-ray, neutron or electron diffraction and/or imaging by a researcher within 15 years of the award of their PhD.

We are excited to announce that Colin Jackson has been awarded the Mathieson Medal for 2021. We look forward to hearing about his research at Crystal 34.



### Colin Jackson: Mathieson Medal Awardee 2021

Colin Jackson is a Professor of Chemical and Structural Biology at the Australian National University. He trained in protein crystallography during his PhD at the Australian National University (with Prof. David Ollis), before

being awarded a Marie Curie Fellowship to study at the Institut de Biologie Structurale (Grenoble, France) with Dr Martin Weik, where he spent a lot of time at the European Synchrotron Radiation Facility (ESRF), primarily working on time resolved crystallography. Since establishing an independent group at the ANU in 2012, he has focused on studying the evolution and engineering of proteins, mostly at the Australian Synchrotron, particular changes in their dynamics, using crystallography. He has published over 130 papers that have been cited over 5000 times.

### Christopher Chantler: Lawrence Bragg Medal 2021

This is awarded for distinguished contributions to science involving X-ray, neutron or electron diffraction and/or imaging. Professor Christopher Chantler virtually accepted the award at Crystal 33 and presented his research. With the restrictions of the pandemic significantly lifted in Melbourne, Megan Maher and Brendan Abrahams were finally able to meet with Professor Christopher Chantler (University of Melbourne) to award the 2021 Bragg Medal in person. Congratulations again to Chris on receipt of this prestigious award.




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**Alexander (Sandy) McLeod Mathieson** (1920-2011). *BSc(Hons)* (1942) *Aberdeen*. *PhD* (1948) *Glasgow*. *DSc* (1956) *Melbourne*. *FAA*.

Sandy Mathieson was a chemist and crystallographer, who pioneered research on crystallographic methods, molecular structure determination and instrument development. He is widely considered to be the father of Australian X-ray crystallography. He was the Chief Research Scientist in the CSIRO Division of Chemical Physics from 1965 to 1985 and was appointed a Fellow of the Australian Academy of Science in 1967. The Sandy Mathieson Award was established by SCANZ in 2012 to honour his contributions to crystallography in Australia.

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## **NEW MEMBERS WELCOME!!!**

*SCANZ welcomes new members, particularly from New Zealand. Benefits of membership include:*

- Global representation through ASCa, IUCr and STA*
- Prestigious Awards*
- Discounted conference fees*
- Exceptionally generous student travel support*
- Information and job vacancy sharing*
- Membership from as little as \$10 per year for students*

*Membership applications can be made through the SCANZ website, contact your friendly SCANZ committee members if you require a sponsor for your application.*

<https://scanz.iucr.org/>

## **SCANZ COMMITTEES**



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