



## President's Address

Dear AXAA Members and Friends,

Organisation of AXAA-2020 is well and truly in full swing, with our line-up of exciting Plenary presentations almost finalised, as well as a developing and diverse line-up of Invited speakers from across Australia and internationally, presenting on a range of topics and techniques. Please visit the [Speakers page of the AXAA-2020 website](#) for more details of what is shaping as a fantastic event.

[Abstract submission](#) for AXAA-2020 is now open (abstract submission deadline is 29<sup>th</sup> November 2019), and registrations will open on 28<sup>th</sup> October (with early bird registration closing 31<sup>st</sup> January 2020). If you have an interest in holding a pre or post-conference workshop, and/or a pre or post-conference tour, now is the time to contact us. Similarly, if you would like to be involved in AXAA-2020 as a Sponsor, please email [axaa@pco.com.au](mailto:axaa@pco.com.au) for a copy of the Sponsorship Prospectus.

Student bursaries covering flights, accommodation and registration are available for AXAA-2020, through our AXAA Student Seminars events to be held in NSW, QLD, VIC and WA in September, October and November 2019. These are high quality events showcasing young

talent in X-ray/neutron analysis. Please contact us if you are interested in participating in a Student Seminars event either as a speaker or a sponsor.

Now is the time to consider nominations for the [Keith Norrish AXAA Award](#) for Excellence in X-ray Fluorescence Analysis, the [Bob Cheary AXAA Award](#) for Excellence in Diffraction Analysis, and the [Malvern Panalytical Award](#) for Excellence in Analysis by an Early Career Scientist. These prestigious awards will be presented at AXAA-2020. Please read on for details of the nomination and selection processes. Now is also the time to be thinking about nominations for members of the next AXAA National Council, which will be elected in the AXAA General Meeting at AXAA-2020. This is your chance to be intimately involved in the organisation and direction setting of AXAA, and the greater number of dynamic and enthusiastic people involved, the better to ensure a vibrant and diverse community.

Finally, our Annual General Meeting will be held in Melbourne at 2 pm on Thursday 14<sup>th</sup> November. A formal announcement will be made via our mailing list.

Nathan Webster  
AXAA President

**AXAA-2020**  
**29 APRIL – 1 MAY 2020**  
AUSTRALIAN X-RAY ANALYTICAL ASSOCIATION

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**CONFERENCE & EXHIBITION**  
Gold Coast, QLD, Australia

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## Report on the ANSTO-HZB neutron school

Helen Maynard-Casely (ANSTO)

The first ANSTO-HZB neutron school was held at ANSTO's Lucas Heights campus between 23<sup>rd</sup>-28<sup>th</sup> June 2019. 24 participants gathered from all around Australia to take part in the school, which was inspired by the long-running Berlin neutron school that had been held at Helmholtz-Zentrum Berlin (HZB) until 2018.

The school aimed to cover all aspects and techniques of neutron scattering offered by the Australian Centre for Neutron Scattering (ACNS). Technical lectures covering each of these areas were undertaken by ANSTO staff and guest lecturers Prof Susan Schorr and Prof Bella Lake from HZB.



**Figure 1** Participants of the first ANSTO-HZB neutron school.

 **Dr Anna Paradowska**  
@AnnaParadowska1

I have a quick check on our @ANSTO-@HZB neutron school 🇺🇸 participants during the practical sessions as you can see 😊 all around happy users on #Pelican @wombat\_acns & #Echidna collecting data & waiting for the first results 🤗👍👏 #neutron4science

15 11:41 PM - Jun 26, 2019 · ANSTO



**Figure 2** Images of practical session from: <https://twitter.com/AnnaParadowska1/status/1143877023086989312?s=20>

These were complemented with lectures that highlighted how neutron scattering has been applied to the field of biology, chemistry, physics, engineering and advanced materials.

Among the external experts invited to give these lectures were Dr Stuart Prescott (UNSW) and Dr Chris Wensich (University of Newcastle).

Many new ideas and possibilities were discussed at the poster session held at the ANSTO café on the Tuesday night, a tradition taken directly from the Berlin neutron school. Participants presented posters on their work and discussed them with neutron scattering, duteration facility and HZB staff, as well as each other! In keeping with the tradition of the Berlin school we even managed to source pretzels to accompany the beer and discussions.

The highlight for many of the participants was the opportunity to undertake practicals on three of the instruments they had indicated interest in. ACNS staff were really generous with their time and enabled the participants to collect data and get a real sense of the experimental possibilities.

Thanks to AINSE for funding flights for our interstate participants, HZB for providing funding for staff to talk and to ANSTO for the facility and staff time to run this well-received school.





# AXAA Community News

## Inviting Nominations for AXAA Awards for Excellence

Please consider nominating your colleagues for the following awards, to be presented at AXAA-2020:

XRF – Keith Norrish AXAA Award for Excellence in X-ray Fluorescence Analysis

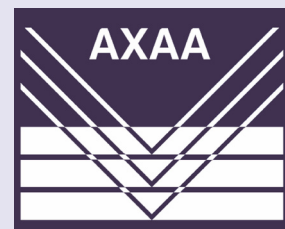
XRD – Bob Cheary AXAA Award for Excellence in Diffraction Analysis

[Click here for details.](#)

These two awards, one for XRF and one for diffraction, are for significant long-term contributions to analysis, rather than say a single paper, and will perpetuate the contribution of the person after whom the award is named.

In addition, a Malvern Panalytical-sponsored Early Career Researcher award will be awarded for excellence in analytical science of interest to AXAA membership. The award will celebrate “outstanding application of laboratory and/or major radiation facility technique(s) so as to achieve significant impact in a field of endeavour”. The recipient will not be limited to having used any specific brand of instrument.

[Click here for details.](#)



## Expressions of interest sought for Keith Norrish Memorial Session at AXAA-2020

A session in honour of the late Keith Norrish will be held during the conference. Expressions of interest are sought for several speakers to present talks of approximately 20 minutes each that highlight the impact and ongoing legacy of Keith Norrish's work in the x-ray community. In particular, Keith made significant advances in the development of XRF in Australia and internationally through innovation in sample preparation using fused beads and matrix corrections and he promulgated several ISO and Australian Standard methods. He also made significant advances in clay mineralogy, identified new minerals and had a mineral named after him. If you would like to be involved please email Sally Birch at [Sally.Birch@csiro.au](mailto:Sally.Birch@csiro.au) for details.



## AONSA Young Research Fellowship 2020

### - Call for applications

The purpose of the Asia-Oceania Neutron Scattering Association (AONSA) Young Research Fellowship Program is to support highly talented young scientists with leadership potential in the Asia-Oceania region, helping them to develop their career and expertise in neutron science and technology. The Program will provide financial support for Fellows to visit major neutron facilities in the region for collaborative research using neutrons.

[Click here for details.](#)

## AOF Synchrotron Radiation School - Call for applications

The 3<sup>rd</sup> AOF (Asia Oceania Forum) Synchrotron Radiation School is seeking applications from science and engineering graduate students and postdoctoral fellows. The school will be held at the National Synchrotron Radiation Research Centre, Hsinchu Science Park, Taiwan from the 3<sup>rd</sup> to 9<sup>th</sup> of November 2019.

Applications require a brief CV (2 pg), letter of support from a supervisor, and a proposal outlining how attendance at the school will benefit your synchrotron-based research program (1 pg).

Please send applications to: [AOF2019@ansto.gov.au](mailto:AOF2019@ansto.gov.au)

Applications close Friday 24<sup>th</sup> August.

Applicants notified by end of September.

## Workshops to better analyse and interpret your XRD data

Malvern Panalytical's Application Specialist, Dr Narygina, teaches the basics in phase ID & quantification analysis, and how to analyse your samples using Aeris XRD. Having completed workshops in Sydney and Brisbane, join sessions in

- [Perth: 27<sup>th</sup> September](#)
- [Melbourne: 11<sup>th</sup> October](#)

## Certificate courses

- XRF in the Workplace - [Perth 9<sup>th</sup> – 13<sup>th</sup> September](#)
- SuperQ software training - [Perth 21<sup>st</sup> – 23<sup>rd</sup> August](#)
- XRD in the Workplace - Sydney 21<sup>st</sup> – 24<sup>th</sup> October
- Phase ID and Rietveld analysis using HighScore:  
[Sydney 30<sup>th</sup> Sep – 2<sup>nd</sup> Oct](#)  
[Perth 3<sup>rd</sup> Oct – 5<sup>th</sup> Oct](#)



Contact Samantha for more: [samantha.singh@malvernpanalytical.com](mailto:samantha.singh@malvernpanalytical.com)

Click links to register.

## 2-day TOPAS Workshop at AsCA 2019, 15-16 Dec 2019 – Registrations are open

This intensive course aims to impart the Rietveld method in theory and practice. Using selected examples, the entire process from profile fitting to crystal structure determination and refinement will be explained.

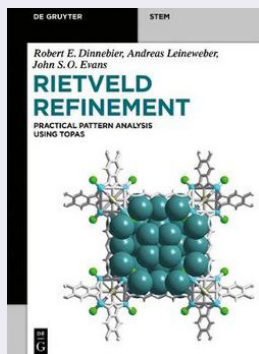
Format: both hands-on and demonstration sessions with the possibility for advanced participants to run the examples on their own laptops simultaneously.

Trainers:

Robert Dinnebier, Sebastian Bette (*Max Planck Institute for Solid State Research, Stuttgart, Germany*)

Arnt Kern (*Bruker AXS GmbH, Karlsruhe, Germany*)

Find out more here: <https://asca2019.org/pre-conference-workshops/>



## SPECTRAplus V3/V4 Course, 14-17 October 2019 – Registrations are open

Introduction to SPECTRAplus V3/V4 : Learn the fundamentals of wavelength dispersive XRF and get an introduction to the external software package.

Trainers:

Elvy Grigolato (*Bruker Pty Ltd*)

Danny Verbeeten (*XRF Scientific*)

Venue: Bruker Pty Ltd, 1/28A Albert St Preston VIC 3072

Dates: 14<sup>th</sup>-17<sup>th</sup> October 2019

For further details, please scan the QR code (below)

or visit: <https://bit.ly/2TGR5Dp>



## ANSTO User Meeting - Call for abstracts

ANSTO will host a User Meeting at the MUSE - Macquarie University NSW campus. The event will coincide with the combined annual meetings of the Australian Neutron Beam Users Group (ANBUG) and the Australian Synchrotron Users Advisory Committee (UAC).

Abstracts are invited in the following themes:

- *Advanced materials*
- *Engineering, industry and innovation*
- *Chemistry and crystallography*
- *Nanomaterials and nanotechnology*
- *Structural biology and biological systems*
- *Food, pharmaceuticals and radiotherapy*
- *Surface science and thin films*
- *Earth, interstellar and extreme environments*

Conference dates: 2<sup>nd</sup> to 3<sup>rd</sup> December 2019

Registration opens: 1<sup>st</sup> September 2019



More information:

<https://www.ansto.gov.au/whats-on/ansto-user-meeting-2019>

## Australian Synchrotron Open Day

The Australian Synchrotron will open its doors to the public on 20<sup>th</sup> October for Open Day.



The light created at the Australian Synchrotron is about a million times brighter than the sun. This brilliant light can be used to assemble tiny machines that would fit into the eye of a needle, improve cancer detection, and develop new drugs to fight malaria.

Open day provides an opportunity to see behind the scenes and talk to scientists about the work we do at this state of the art facility.

[Register for free entry & tour options here.](#)

## Current Job Opportunities

Intertek are seeking a Chemist specialising in XRD analysis in Maddington, WA.

[Click here for details.](#)

The Australian Synchrotron is seeking Beamline Scientists on X-ray Absorption Spectroscopy (XAS), Infrared Microscopy (IRM), and the new BioSAXS and Advanced Diffraction and Scattering (ADS) beamlines.

[Click here for details.](#)



## AXAA Website and Contacts

Please visit our website, [www.axaa.org](http://www.axaa.org), for further information, or follow us on Twitter [@axaa\\_org](https://twitter.com/axaa_org).

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William Rickard (Curtin University, WA)  
Talitha Santini (University of Western Australia,  
WA)  
Brianna Ganly (CSIRO, NSW)

## AXAA Membership

All registered participants of the AXAA-2017 conference are automatically granted AXAA membership for 3 years. Alternatively, new memberships can be obtained free of charge, by making an application to the National Council.

Candidates should fill out the membership form from the [AXAA website](http://www.axaa.org), and provide a short statement about why they would like to join. Please send these to the National Council Secretary Mark Styles.

## AXAA Resource Centre

There are a range of resources available on the [AXAA website](http://www.axaa.org), including video recordings of the two Public Lectures at AXAA-2017, tips for Rietveld Analysis, Clay Analysis, XRF tips, and more. We welcome further contributions to our Resource Centre.

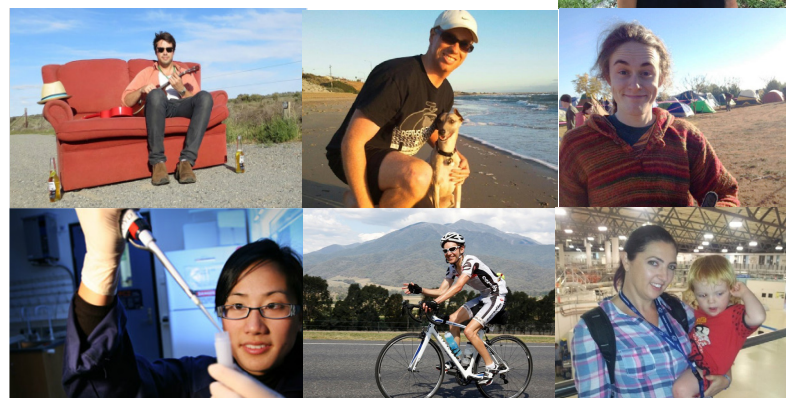
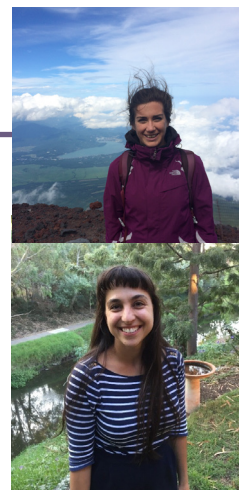
## Next AXAA Newsletter

The next issue of the AXAA Newsletter will be distributed in December 2019. Please feel free to send contributions for the newsletter to Jessica Hamilton at [ausxray@gmail.com](mailto:ausxray@gmail.com). Any comments or feedback about the Newsletter are welcome.

## A Day in the Life of an X-ray / Neutron Scientist

We are seeking posts for our 'Day in the Life' series. If you'd like to contribute, or know someone who might be interested, please contact National Council Communications Editor Jessica Hamilton at [ausxray@gmail.com](mailto:ausxray@gmail.com).

W:[www.axaa.org/a-day-in-the-life.html](http://www.axaa.org/a-day-in-the-life.html)





# UPHOLDING WORKPLACE HEALTH SAFETY WITH STRINGENT MONITORING OF RESPIRABLE SILICA AND ASBESTOS

X-ray diffraction for low limit of quantification as per EPA and ISO norms

The control of respirable harmful airborne particles is of paramount importance for any business dealing with mineralogical materials. **Why the need for stringent control of respirable silica and asbestos?** When inhaled, the **fine particles** are deposited in the respiratory tract causing various lung conditions like lung cancer, chronic bronchitis. Recently, ovarian cancer was linked to the use of talcum powder containing asbestos fibers.

## What are the sources of exposure to respirable silica and asbestos?

Respirable silica is created during the mechanical treatment of silica-containing materials. This could be quarrying, tunneling, brick and tile making, stone cutting, construction and demolition works, foundry work, grit and sand blasting, etc. The fine silica particles become airborne and can be inhaled. At every step of the process, from a mine site to the final product manufacturing (construction materials, paint, paper, insulation, vehicle parts, health care and cosmetics products, etc.), it is an obligation of a raw materials supplier and a manufacturer not only to ensure safe work conditions for the employees, but also to guarantee safe-to-use products.

Asbestos, though widely regulated in most countries, is still used in countries like India, China and Russia. It is favored for its cost-effectiveness and insulating properties. Even today you may find asbestos in cement, fire-resistant materials and even talc. Talc is widely used in the production of paints, paper, ceramics, plastics, rubber, health care products and cosmetics.

The good news is that asbestos has been mostly banned from as early as 1970s, so its prevalence is less. However, large quantities of asbestos may still lie in old buildings and machine parts. That is why government agencies, people renting or using these old facilities should check and regulate the asbestos content. Construction companies, government and environmental agencies who are managing the demolition and disposal of these asbestos-containing items should also take adequate measures to ensure not only safety at every step in the work place, but also no harm to the general public.

## What are the prescribed methods for better monitoring of respirable silica

Historically several analytical methods were used for the quantification of respirable silica, including atomic absorption, colorimetry, gravimetry, microscopy, Fourier transform infrared spectroscopy (FTIR) and X-ray diffraction (XRD). Most of those methods fell out due to low sensitivity. Nowadays, only FTIR and XRD are utilized for the respirable silica analyses, as the most sensitive methods allowing to comply with existing norms. Both methods have their pros and cons, but it is generally accepted that XRD is more accurate in identifying silica polymorphs. OSHA ID-142, for example, defines XRD as the only accurate technique for the quantification of crystalline silica in various types of industrial dust.

## Interested to learn more about how to monitor?

Tune into a webinar on demand hosted by Dr Nicholas Norberg, an application specialist at Malvern Panalytical's supply center in the Netherlands. He discusses the sources of exposure and regulatory norms like ISO 22262-3 which require quantitative analysis down to 0.1%. He also provides more insight to the various methodologies that can be used for the identification and quantification, and, more importantly, which methods provide the most sensitive and accurate results towards stringent norm compliance. During the webinar, the audience will learn about the range of X-ray diffractometers that government laboratories and production companies can use. For instance, solutions for **regular screening** and solutions that are more **sensitive for certification purposes**.

Watch our webinar on demand  
[bit.ly/2Yg1Yyy](https://bit.ly/2Yg1Yyy)







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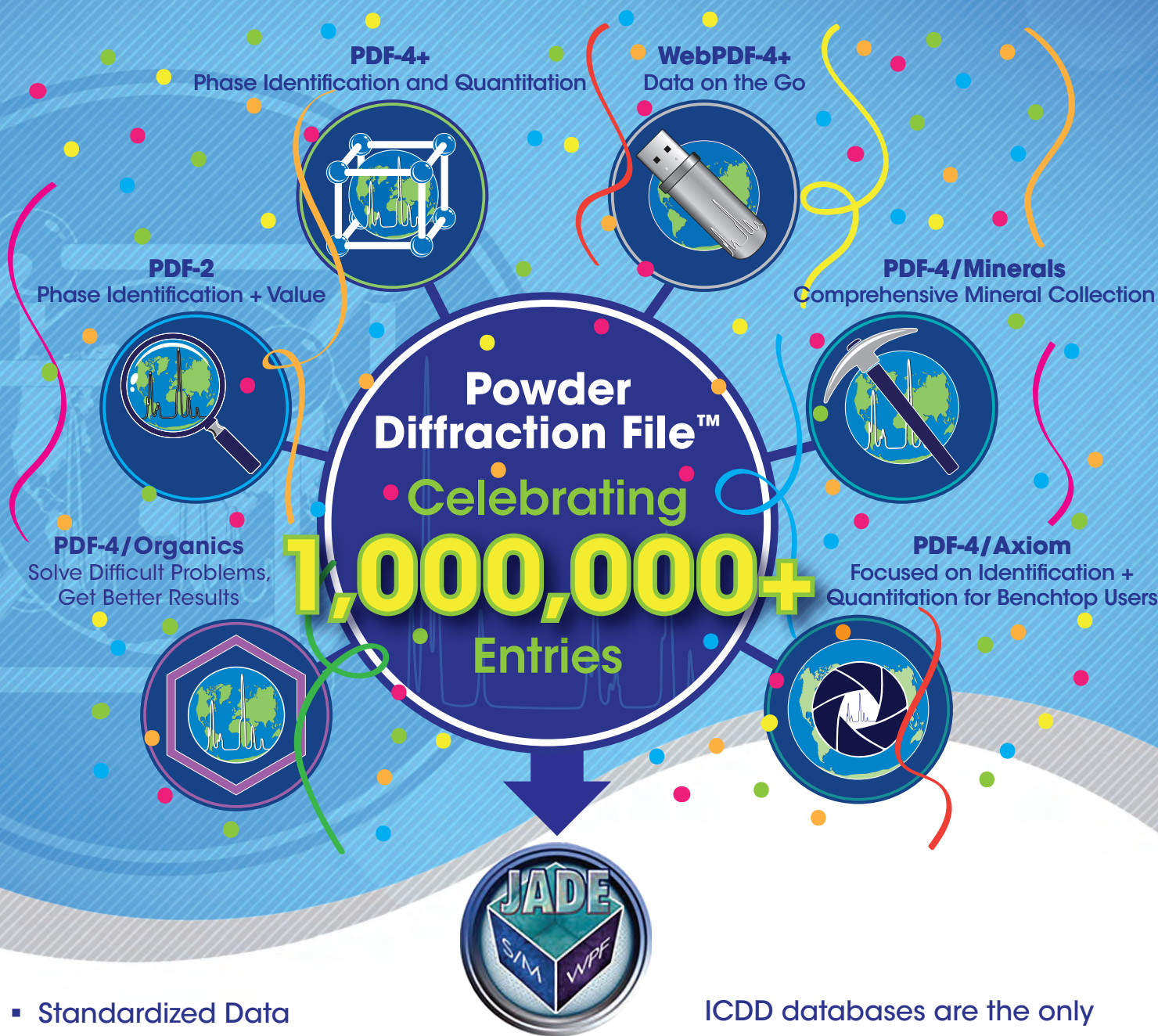
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