



President's Address

Dear AXAA Members and Friends,

Welcome to the first AXAA Newsletter for 2017! Many of you participated in the 2017 AXAA Workshops, Conference and Exhibition (AXAA-2017), and I'm sure you'll agree this event was a success with over 200 delegates with nearly one quarter coming from outside Australia, from 19 countries. The highlights for me were the quality and breadth of the scientific program, student involvement where we doubled participation from AXAA-2014, and the level of diversity, especially gender diversity, which formed the foundation of our AXAA-2017 conference policy. I'd like to thank again all of those people who had a huge impact on AXAA-2017 as part of the Conference Committee, with special mention to our honorary AXAA members Sarah Robinson and Jane Yeaman from Tulips Meeting Management. I'd also like to once again thank all of those people who contributed to the AXAA-2017 Workshops, in particular Ken Turner and Sharon Ness who led the organisation of the XRF Basics Workshop, and Matthew Rowles and Ian Madsen who led the XRD Basics Workshop. This was a big job which is much appreciated. Of course, events like AXAA-2017 cannot go ahead without the support from all of our sponsors; thank for your ongoing support of AXAA and looking forward to seeing you again at AXAA-2020!

The General Meeting at AXAA-2017 saw the election of a new AXAA National Council which also comprises Vanessa Peterson (Vice-President), Mark Styles (Secretary), Sally Birch (Treasurer) and Jessica Hamilton (Communications Editor), and Natasha Wright, Gordon Thorogood, Talitha Santini and William Rickard (Members). I'd like to extend a very warm welcome to our new Council members, especially, and look forward to working with them over the next three years as we head towards AXAA-2020. Whilst we will take a break from our dedicated student seminar events this year, keep an eye and an ear out for AXAA-sponsored seminars, the first of which will be held in Perth later this year (further details will be provided as they become available).

Finally, it's not too late to submit a paper to be published as part of the AXAA-2017 Conference Proceedings special

issue of Powder Diffraction Journal. Any Plenary, Invited, Oral or Poster presenter at AXAA-2017 is invited to submit their manuscript(s) online using [Cambridge University Press](#), and remember that contributions on all topics presented in the scientific program of AXAA-2017 are encouraged, not just those involving powder diffraction.

Nathan Webster
AXAA President



AXAA-2017 Workshops, Conference and Exhibition

5-9 February 2017

Pullman Albert Park, Melbourne VIC

'Innovation from Characterisation' was the theme of this year's Australian X-ray Analytical Society Workshops, Conference and Exhibition (AXAA-2017), which again provided an exceptional international forum for scientists and technologists from industry and academia, to interact, learn and discuss technological developments and present new data and ideas. Held in Melbourne – home to the Australian Synchrotron, CSIRO Clayton campus, several universities and resident industries – the event attracted delegates from all over the world united by their work with X-ray analytical techniques and related synchrotron radiation and neutron scattering methods.

The well-attended pre-conference XRF and XRD workshops were excellently organised and presented by a team led by Ken Turner (Ken Turner Consulting), Sharon Ness (Intertek), Matthew Rowles (Curtin University) and Ian Madsen (CSIRO).

The level was well pitched to allow newcomers to the field to quickly gain traction, while at the same time providing an opportunity for more experienced users to deepen their knowledge and fine-tune their own procedures and techniques – be it in sample preparation, calibration, data reduction or quality control. Of particular interest to me were the presentations by Tom Blanton and Tim Fawcett about Data Mining and New Data Analysis Capabilities from ICDD, opening up new avenues for rapid assessment of published work. The expertly delivered advanced workshops on Tomography (led by Sherry Mayo, CSIRO), PDF/Total Scattering (Thomas Proffen, Oak Ridge National Laboratory) and Thin Film Analysis (Shintaro Kobayashi) provided cutting-edge information on these techniques, and inspired us to ‘look over the fence’. The highly informative workshop on Line Profile and Microstructure Analysis using Powder Diffraction, presented by Matteo Leoni (University of Trento) at the Australian Synchrotron in association with AXAA, demonstrated how much information can be extracted from XRD line profiles, encouraging us not only to fit, but also to analyse complex peak shapes.

The conference part was kicked off in style by two fascinating public talks: “*Journeying to the Centres of the Planets*” by Helen Maynard-Casely (ANSTO), and Michael Varcoe-Cocks’ “*When Art and Science Collide: X-ray Fluorescence Elemental Mapping of Nineteenth Century Paintings From The National Gallery of Victoria.*”



Peeling back the layers of distant planets and coats on paintings with Helen Maynard-Casely and Michael Varcoe-Cocks, respectively.

The public talks were followed by the enjoyable Welcome Reception at Eureka89 (sponsored by Bruker), where spectacular views of the city were interrupted only by occasional speeches or plates of delicious food and drinks that just kept coming. In his welcoming address, AXAA President Nathan Webster highlighted the achievements in diversity of this year’s event, which - thanks to strategic planning by the AXAA National Council and AXAA-

2017 organizing committee – featured significantly larger numbers of female plenary and invited speakers, and attracted more than double the number of students compared to AXAA-2014. Nearly a quarter of the delegates came from overseas, from 19 different countries, making AXAA-2017 a truly diverse and international forum.

The high quality plenary talks exemplified the different perspectives this event has to offer and which make it so valuable, with presentations focussing on ‘Innovation from Characterization’:

- *at the Australian Synchrotron (Andrew Peele, Australian Synchrotron)*
- *through development of an XRD structural characterization method (Total Scattering, Thomas Proffen)*
- *in the context of an ore deposit operation (Kathy Ehrig, BHP Billiton)*
- *through X-ray instrument and technique development (Maia detector array and Synchrotron XRF element imaging, Chris Ryan, CSIRO)*
- *and with three case studies from materials and energy research (Bridget Ingham, Callaghan Innovation)*



Lively discussions at the posters (left) and Live demonstration of automated flux-weighting at the PANalytical booth (right).

Delegates could choose from a total of 90 talks and 46 poster presentations, or stroll across the exhibition floor to learn about new instruments, accessories or databases, where live demonstrations during the breaks attracted particularly large crowds.

The Career Path Panel Discussion was facilitated by Gordon Thorogood (ANSTO) and featured panellists from research, industry and education. It highlighted the diversity of careers in this field, the important role of mentors, and touched on potential barriers due to gender bias, promoting a lively discussion between the panellists and the floor.



Conference dinner at The Park.

The festive atmosphere of the conference dinner at The Park (sponsored by PANalytical) provided a fitting background to the award ceremony. Greg Moore was awarded the Keith Norrish AXAA Award for Excellence in X-ray Fluorescence Analysis for significant long-term contributions to X-ray analysis. Mark Raven (CSIRO) received the Bob Cheary AXAA Award for Excellence in X-ray Diffraction Analysis. Mark Styles (CSIRO) received the PANalytical Award for Excellence in Analysis by an Early Career Scientist. Outstanding student contributions by Jessica Hamilton and Brianna Ganly were honoured with the ICDD-CSIRO co-sponsored awards for Best Student Poster Presentation and Best Student Oral Presentation, respectively. Congratulations to all!



Left: Awardees Mark Styles, Mark Raven and Greg Moore. Right: Jessica Hamilton holding her Best Student Poster Award, with Natasha Wright (CSIRO), Tom Blanton (ICDD), Nathan Webster (AXAA president, on right).

Half-day excursions to the Australian Synchrotron or the National Gallery of Victoria Conservation Facilities rounded off AXAA-2017. We thank the National Council of the Australian X-ray Analytical Association (AXAA) and the AXAA-2017 Conference Committee chaired by Nathan Webster (CSIRO) for organizing this excellent event, and are grateful to the Conference Secretariat team from Tulips Meetings Management for facilitating its smooth proceeding. I look forward to catching up again in 2020!

Ulrike Troitzsch (Australian National University)

To Tweet or Not to Tweet, What is Your Platform?

Social media can seem like a mine field for researchers, whether you are in your early career or an Emeritus Professor. The prospect that anything you post can encounter both adulation and severe criticism from all over the world can be rather daunting. However, it is becoming an increasing part of professional life for a researcher (Collins, Shiffman et al. 2016), and can be a fantastic tool to widen your horizons. So how do you get into it?

The first stage is to pick your platform – aside from the more general social media platforms (such as Twitter, Facebook and LinkedIn) there is now an astonishing array of more specialist networks – including Researchgate, Academia.edu and Mendeley aimed at us researchers.

If you're going to identify on social media as being employed (or even studying) at a particular institution it can be a good idea to have a read of their social media policy. Mostly, this will involve stating in your profile that expressed views are your own, but some institutions may have extra considerations so it is good to be mindful of those.

Another tactic is to keep platforms for specific parts of your life, being mindful of the audience that you are reaching. For instance, on Twitter, most of the people I follow and who follow me are other researchers or at least have an interest in science. As a result I mostly use Twitter as a professional tool. I've found it a marvellous way of widening my horizons – as you can fall into a bit of a silo within your own field.

How do I use Twitter to support my science? For me it has been a great tool for finding opportunities; all jobs I've had have been posted there – I've also discovered small grants and events that way too. It's also been a great way to find out what's being discussed at international conferences without leaving your desk. Most conferences will have a hashtag, which you can search and see what's been generating discussion. Some societies have been even running virtual poster conferences via Twitter – so it can be a way to present your work to a wider audience. It's a great opportunity to set up specialist discussion groups – I've even taken part in journal clubs. Social media can also play a support role too. If you're an under-represented minority in the workplace, it is a way that you can find others in your situation and discuss issues as they arise.

I don't think I've by any means covered all of the uses social media has to researchers or indeed really done justice to all the platforms there are - some of my colleagues use LinkedIn daily, but I only go on there to accept contact requests at present! I would encourage all researchers to investigate social media, if you're unsure about a particular platform perhaps pop on there and see how others are using it. The main thing is to make it work for you, otherwise it's just another source of procrastination.....

Reference

Collins, K., D. Shiffman and J. Rock (2016). "How Are Scientists Using Social Media in the Workplace?" PLOS ONE 11(10): e0162680.

Helen Maynard-Casely, ANSTO

Outreach at ANSTO and the Australian Synchrotron

The Australian Nuclear Science and Technology Organisation (ANSTO) is home to the only multi-purpose nuclear reactor in Australia. OPAL operates an impressive 300 days a year producing more than 10,000 doses of nuclear medicines per week, irradiating silicon for industry and providing neutrons for research.

The campus at Lucas Heights, in Southern Sydney, receives 15,000 visitors a year and runs an outreach program that reaches many more. There has been good progress but public engagement around nuclear science has its challenges.



"In Australia, despite the fact that nuclear has enabled significant developments in industry, health and research, the perception many people have is one of mistrust or apprehension and that nuclear has no or little value to the community," says Rod Dowler, leader of the Discovery Centre, which delivers ANSTO's education and outreach programs. When it comes to public engagement around

nuclear, perception is the reality.

"We need to provide information," says Dowler, "otherwise the void will be filled with mis-information initiated by a lack of knowledge and, in some cases, critical groups. That is why the communications team at ANSTO strives to engage and inform through education."



The Discovery Centre provides a combination of virtual and online learning experiences, along with daily tours tailored to a wide range of audiences both in the education sector – from primary school to high school – and the general community. Visitors spend three hours with ANSTO's Education Officers, who are enthusiastic about science.

Participants attend an introductory lecture, which includes radiation demonstrations, and tour three locations on site: the OPAL reactor, the Australian Centre for Neutron Scattering and the Centre for Accelerator Science.

The tours are free and visitors are encouraged to take home printed resources detailing more information and science posters. Seven years ago, ANSTO welcomed 7,500 visitors annually. In four years, it had doubled its visitor numbers to 15,000.

"Feedback from participants confirms that a two to three hour experience is enough to provide the vast majority of the general public with a level of information they are comfortable with. Many take pride in the role that ANSTO plays in providing benefits to all Australians," said Dowler. In videoconferencing sessions, Education Officers conduct radiation-based experiments with schools outside NSW and organise Q&A sessions with ANSTO scientists, so that students throughout Australia can benefit from this resource.

The Discovery Centre also hosts Teacher Professional Development days both in NSW and interstate. Teachers can accrue registered professional development hours in some states when they take part in these programs.

ANSTO works closely with the local community surrounding its campus at Lucas Heights – the Sutherland Shire – to improve the perception of nuclear among its immediate neighbours. The Discovery Centre offers science-themed workshops in the holidays to cover a variety of interests: from geoscience to kitchen chemistry, coding and rocket-building. These hands-on sessions are designed for kids who want to explore the applications of science beyond the classroom, and many parents take their children to more than one workshop each holiday.

ANSTO engages the public with citizen science projects, such as the current Australian Feather Map Project. Resident scientist Dr Kate Brandis is asking for feathers to be sent to her from wetlands around Australia. The feathers are analysed using nuclear techniques to find out what the birds are eating and to gain information about their habitats.



Communication and education through entertainment is also effective, and ANSTO has developed a travelling show called Fact or Fiction. This is a 90-minute interactive show which highlights themes around popular culture, and is designed for a general audience. It is a fun and informative experience that celebrates science. Last month, ANSTO's Fact or Fiction 2.0 headlined the World Science Festival in Brisbane where it delved into the science behind the internet.

Last year, ANSTO took formal ownership of the Australian Synchrotron in Clayton, at Melbourne, following many years of operating the facility. Currently, the Australian

Synchrotron schedules science programs targeted at different levels, from years 5 and 6 to secondary physics students.

In October 2015 the Australian Synchrotron organised an Open Day and invited the local community to look behind the scenes. More than 2,000 visitors were taken on guided tours of the facility and synchrotron scientists were on hand to answer questions. Another Open Day is scheduled for later this year.

“We’re currently working to determine the needs of the community [in Clayton],” says Dowler, “to find out which outreach programs would be the most effective.” When it comes to communicating about nuclear science, the message is clear: education gives the public their best chance to reach an informed opinion.

Eleanor Reynolds, ANSTO

X-ray Materials Analysis Internet Courses – Wavelength Dispersive XRF and Powder XRD (Plus Mentoring Program on Rietveld XRD Phase Analysis)

Mode of Instruction for XRF and XRD Courses

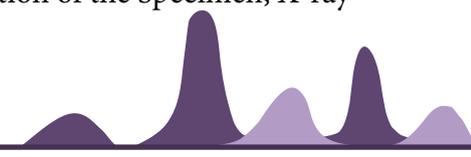
These internet-delivered courses provide XRF and XRD analysts, particularly those new to x-ray analysis, with on-site and/or at-home instruction on the underlying principles and analytical methods. Features of the courses :

- *Start at any time*
- *Self-paced instruction to accommodate the needs of busy people*
- *Study materials transmitted as e-mail attachments in the form of a set of modules; with an assignment being set for each module*
- *Feedback on the assignments provides excellent mentoring.*

The courses have a substantial cohort of international participants, as well as Australians, and are being used by companies as vehicles for in-house XRF and XRD training, and also for Rietveld phase composition analysis. Courses Director: Dr Brian O'Connor

Internet XRF Course: Series 10, 2017

The Internet XRF Course comprises modules on - XRF Overview; X-ray Excitation of the Specimen; X-ray



Dispersion and Detection; XRF Data Measurement; Data Analysis Basics; Methods of Quantitative Analysis; Absorption-Enhancement Corrections; Specimen Preparation; Major Component Analysis Using Fusion Buttons; Trace Element Analysis Using Powders; and Analysis of Sub-Milligram Environmental Samples.

Internet XRD Course: Series 5, 2017

The internet XRD Course comprises modules on - XRD Overview; Essential XRD Fundamentals; XRD Measurement Strategies (I); XRD Measurement Strategies (II); Search/Match Identification Analysis (I); Search/Match Identification Analysis (II); Case Studies in Search/Match identification Analysis; Phase Composition Analysis Using Line Intensities; and Introduction to Advanced Methods (indexing, Rietveld phase analysis, structure solution, etc.)

Internet Rietveld XRD Analysis - Personalised Mentoring Program

The internet Rietveld XRD Analysis Personalised Mentoring Program is designed to support people who need help in becoming proficient in Rietveld-analysing their materials for phase composition. The program is customised to meet the needs of the participant, and will include learning how to efficiently Rietveld-analyse their own XRD patterns and will also address requirements for analysing large suites of XRD patterns. The program is structured according to the background knowledge of the mentee, and also the Rietveld software used in the person's laboratory.

Further Information and Enrolment Procedure:

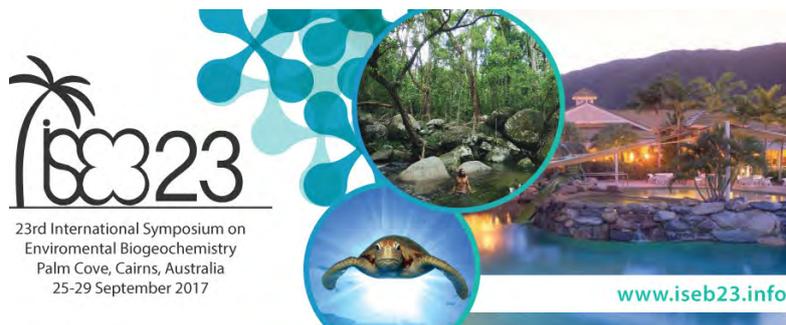
Email: brian_oconnor@iprimus.com.au
(Tel 08 9291 7067 / 0417 775 023)

Calendar of Events:

Date	Event	Location
Start at any time	XRF I-Course	Internet delivery
Start at any time	XRD I-Course	Internet delivery
Start at any time	Rietveld XRD Analysis Personalised Mentoring Program	Internet delivery

Brian O'Connor

Upcoming Events



ISEB23

24-29 September 2017
Palm Cove, Tropical North Queensland, Australia

The International Society of Environmental Biogeochemistry's 23rd Symposium (ISEB23) will take place in Australia for the first time in 2017. The Symposium will be held in Palm Cove, Tropical North Queensland, Australia from 24 September to 29 September 2017. This international five-day Symposium will provide an excellent opportunity for international and local environmental biogeochemists to meet and discuss the most recent developments in their fields of research.

Abstract Submission Closing Date: **31st May 2017**

For more information:
Email: iseb23@pco.com.au
Website: <http://www.iseb23.info>



Denver X-ray Conference

31st July - 4th August 2017
Big Sky Resort, Big Sky, Montana, USA

The world's largest X-ray conference will take place this year at Big Sky in Montana, USA from the 31st of July to the 4th August. Abstracts are still being accepted in the XRF or XRD poster sessions.

Website: <http://www.dxcicdd.com>

AXAA Website and Contacts

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

NATIONAL COUNCIL PRESIDENT:

Nathan Webster
CSIRO Mineral Resources, Box 10, Clayton South, VIC 3169
Telephone: (03) 9545 8635
e-mail: nathan.webster@csiro.au

NATIONAL COUNCIL VICE PRESIDENT:

Vanessa Peterson
Bragg Institute, ANSTO, Locked Bag 2001, Kirrawee DC NSW 2232
Telephone: (02) 9717 9401
e-mail: vanessa.peterson@ansto.gov.au

NATIONAL COUNCIL SECRETARY

Mark Styles
CSIRO Manufacturing, Private Bag 10, Clayton South, VIC 3169
Telephone: (03) 9545 8179
e-mail: mark.styles@csiro.au

NATIONAL COUNCIL TREASURER

Sally Birch
CSIRO Mineral Resources, Private Bag 2, Glen Osmond SA 5064
Telephone: (08) 8303 8487
e-mail: sally.birch@csiro.au

NATIONAL COUNCIL COMMUNICATIONS EDITOR

Jessica Hamilton
Monash University, Room 124. 9 Rainforest Walk, Clayton, VIC 3800
e-mail: jessica.hamilton@monash.edu

The next issue of the AXAA Newsletter will be distributed in August 2017. Please feel free to send contributions for the newsletter to Jessica Hamilton at any time. Any comments or feedback about the Newsletter are welcome.

NATIONAL COUNCIL MEMBERS

Natasha Wright (CSIRO, VIC)
Gordon Thorogood (ANSTO, NSW)
Talitha Santini (University of Queensland, QLD)
William Rickard (Curtin University, WA)

AXAA Membership

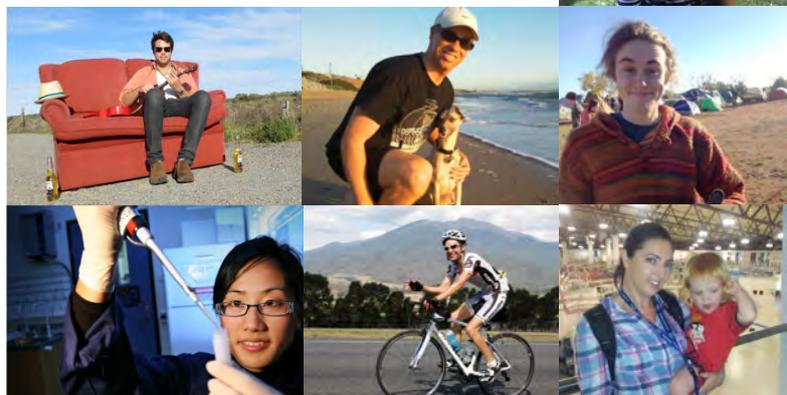
All registered participants of the AXAA-2017 conference are automatically granted AXAA membership for 3 years. Alternatively, new memberships can be obtained free of charge, by making an application to the National Council. Candidates should provide their CV and a short statement about how they intend to contribute to the organisation. Please send these to the National Council Secretary Mark Styles.

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

In 2016, AXAA started a blog series as a new way to get to know our members. Our 'Day in the Life' posts take a peek behind the scenes of different workplaces to find out the fun bits, the challenging bits, and why you do what you do.

We are currently seeking posts so if you'd like to contribute, or know someone who might be interested, please contact National Council Communications Editor Jessica Hamilton.

W: www.axaa.org/a-day-in-the-life.html



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.



Fast, Easy to Use with no Compromise on Image Quality

The new Bruker SkyScan 1275 delivers a Winning Combination for Research and Industrial Markets



The SkyScan1275 is specially designed for fast scanning using new advances in the technology of X-ray sources and efficient flat-panel detectors. Shortening the distance between source and detector and very fast camera readout opens the possibility for reducing scan time down to a few minutes without compromising image quality. Current developments in fast reconstruction accelerated by graphics cards give an additional gain in performance and speed.



Fast realistic visualization of results by volume rendering enables fabulous imaging of internal object's microstructure with power to reveal all internal details by virtual cut or virtual flight around and inside the objects. Fast scanning with high quality results is crucial for scientific research and industrial applications such as quality control or production process monitoring. The SkyScan1275 provides a high level of automation. Simple push of a button on the front of the system starts an auto-sequence of a fast scan followed by reconstruction and volume rendering executed during scanning of the next sample.



- This highly automated micro-CT system allows pushbutton operation with a preselected sequence of actions including scanning, reconstruction and volume rendering
- A wide range of X-ray energies 20-100kV and small spot size in the X-ray source plus multiple filter options allow optimal scanning conditions to be selected for any particular application

- This scanner has a generous object size range up to 96mm in diameter and 100 mm in length, and can be used for large samples including industrial parts and assemblies
- The distortion-free flat-panel active pixel 3Mp detector includes a fiber-optic plate to ensure long lifetime and the highest possible reconstruction quality and accuracy
- Shortest scanning time is 80 seconds
- GPU-accelerated 3D reconstruction supports all image formats with speed-up 5-10 times compared to conventional CPU based reconstruction
- The supplied software package includes programs for 2D/3D image analysis and realistic 3D visualization by surface / volume rendering of large format scanning results, data export and volume rendering on mobiles
- Optional stages for micropositioning and material testing allow scanning of a sample under compression, tension, heating or cooling
- The control software and all application programs are running under Microsoft Windows 10. In the end of a scan, the scanner can send you an e-mail with a direct link to scan results out without realigning the whole instrument; a vacuum pump is no longer needed because of the new He-filled and sealed optics housing - to name only a few advantages.

For more information, visit www.bruker.com/skyscan1275



D8 ADVANCE



A PLUS for your research!

- NEW** Compact Cradle^{plus} and Compact UMC stage offering extended sample handling
- NEW** TRIO: triple beam path optic for measuring any type of sample, polycrystalline and epitaxial, at the push of a button
- NEW** LYNXEYE XE-T: the one and only detector enabling energy dispersive zero, one- and two-dimensional diffraction
- NEW** PILATUS3 R 100K-A: two-dimensional diffraction with the benchmark among all Hybrid Photon Counting detectors on the market

Contact us for more details: Bruker Pty Ltd
Email: sales.anz@bruker.com

www.bruker.com

PANalytical X'press Updates



Acquisition of Pixirad

PANalytical has today confirmed that its parent company Spectris plc has acquired Pixirad Srl., an Italian technology company that develops and distributes high performance X-ray detectors. The business will be integrated into PANalytical within Spectris' Materials Analysis division. Pixirad was established in 2012 under the spin-off programme of the Istituto Nazionale di Fisica Nucleare (INFN). The detector know-how was originally developed through research into advanced particle physics and space research technologies and has been further improved by Pixirad for use with high energetic X-rays.

PANalytical sells the Pixirad detectors as a top-of-the-range option for its Empyrean X-ray diffraction (XRD) instrument, used for various materials analysis applications. An example of the exciting applications for the Pixirad detector-enabled Empyrean is the study of the characteristics of Li-ion batteries as they are run through repeated charge-discharge cycles. Demand for Li-ion batteries and the applications they are used in are growing significantly. The added insight brought from the Empyrean instrument helps developers and manufacturers understand the causes of performance reduction thereby demonstrating how technological advances originating from fundamental research in the field of nuclear physics can be made relevant for solving societal problems.

The combination of Pixirad's know-how with PANalytical's expertise in solutions utilising advanced X-ray detectors will result in rapid expansion of the range applications addressed by existing and future instruments.

Spectris is a well-respected and long-established supplier of productivity-enhancing instrumentation and controls. Headquartered and listed in the UK, Spectris employs around 8,900 people in more than 30 countries.

PANalytical unveils new benchtop XRD system Aeris in Australia

Melbourne – PANalytical has officially launched the new benchtop XRD system Aeris on 5 February 2017 at the Australia X-ray Analytical Association (AXAA) conference. Ease of use and maximum benefits for the user have been the key aspects of this newly developed system, which provides fast and precise phase information of the materials analyzed.

Aeris is accessible for everyone – its built-in touch screen with the intuitive interface directly displays all results. At the same time Aeris is designed for low cost of ownership – it only requires a single-phase power outlet and neither needs cooling water nor compressed air. Nevertheless, as the instrument incorporates many technologies proven on PANalytical's high-end systems, its performance is exceeding typical benchtop X-ray diffractometer performance. Data quality and speed of data acquisition have so far only been observed on full-power systems. Additionally, Aeris is the first benchtop XRD system that is fully automatable and can easily be incorporated in industrial production control.

As many industries have specific demands for their materials' analysis, Aeris editions are available, which have been tailored to the specific needs of the cement, mining and metals industries. They provide fast and precise mineralogical phase information, which can be used for control and optimization of the production process. The Research edition of Aeris, on the other hand, is designed for quick XRD scans in any laboratory and is easily accessible for students. Especially with its unique 2D option it also serves as an ideal instrument for teaching XRD.

"We're proud to be the first to launch Aeris in the Asia Pacific region. With its ease of use and superior data quality that's comparable to floorstanding systems, we're confident it will be incredibly useful for many industries" comments Scott Gilroy, country manager of PANalytical Australia.

Aeris

World's first fully automatable benchtop X-ray diffractometer



See how XRD is
made easy
XRDisEASY.com

- Compact with **best-in-class data quality** that's comparable to floor standing systems
- **Quick analysis time** from as fast as 5 mins
- **High throughput** with as many as 12 sample batches per hour
- Robust design for **dust protection**
- Built-in **intuitive touch screen** for direct feedback



Also featured at AXAA was PANalytical's robust and portable benchtop solutions tailored for the mining industry such as Epsilon 1 & 3 X-ray spectrometers which can be placed at the back of the boot.



Platinum
sponsor of



AXAA-2017

Take your lab to the sample

Obtain fast and accurate results for your mining applications in the field

Mineral exploration is becoming more complex and costly and with increased scrutiny on quality control, the demands for fast and quality analysis continue to grow. Imagine how much you can save if you have access to fast screening and quality data at the push of a button. Users are able to analyze samples according to international norms, and have access to all advanced software packages PANalytical offers, such as Omnia, FingerPrint and Oil-Trace. This technical guide provides several options to install a PANalytical benchtop spectrometer in your vehicle for field analysis.

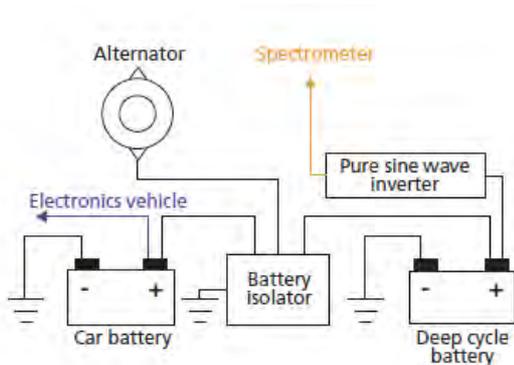
Installation schemes

To install an Epsilon EDXRF benchtop in your vehicle, a pure sine wave inverter is necessary to convert the DC power of the battery into the required AC power. To supply the required power, there are three options.

Recommended solution

Option 1. Power the spectrometer with a dual battery system. Here, a second battery, preferably a deep cycle battery, is installed in the car and connected via a battery isolator to the vehicle's alternator and car battery (see scheme below). Both batteries will be charged by the car's alternator. The car battery remains charged for the vehicle and the second battery is used for the spectrometer.

For option 1, PANalytical advises that a certified car dealer or mechanic performs the installation.



Recommended wiring scheme for a dual battery system (option 1). This installation is very common for recreation vehicles (mobile homes) and broadcast vehicles.

Transform your mining process with our robust and portable benchtop solutions!



info.australia@panalytical.com
http://www.panalytical.com/Epsilon-1-Mining.htm



Alternatives

Option 2. Connect the spectrometer via the inverter to the car battery, and analyze while the engine is running.

Option 3. Put a second battery in your vehicle, which is disconnected from the vehicle's electrical system – this will require the removal and recharging of the battery between trips. Here it is advised to use a deep cycle battery because it can be fully discharged without negative effects on its lifetime.



Essential parts

Pure sine wave inverter

A pure sine wave inverter is necessary. The minimum requirements are an operating capacity of 600 W and an output of 230 VAC at 50 or 60 Hz.

Deep cycle battery

A deep cycle battery with a capacity > 75 Ah is sufficient for operation of the different Epsilon benchtops over a working day of 8 hours. This capacity is based on a disconnected configuration (option 2), when the benchtop is constantly operating at maximum power. For Epsilon 3x spectrometers, additional battery capacity is required to power the laptop.

Battery isolator (only for option 1)

The isolator should have the capacity of the alternator, as well as the load required by the spectrometer.

Application examples

- Mineral exploration
- Accurate quarry/mine management
- Soil analysis to optimize fertilizers
- Quality assurance (sulfur content in gas station fuel)
- Pre-laboratory site startup

Global and near



PANalytical B.V.

Lelyweg 1, 7602 EA Almelo
P.O. Box 13, 7600 AA Almelo
The Netherlands
T +31 (0) 546 534 444
F +31 (0) 546 534 598
info@panalytical.com
www.panalytical.com

Regional sales offices

Americas
T +1 508 647 1100
F +1 508 647 1115

Europe, Middle East, Africa
T +31 (0) 546 834 444
F +31 (0) 546 834 499

Asia Pacific
T +65 6741 2868
F +65 6741 2166

Explore the very small with Xenocs solutions

Xenocs is proud to introduce you to their solutions for characterizing nanostructures. Using Small and Wide Angle X-ray Scattering techniques, the Xenocs solution combines unique ergonomics, ease-of-use and unparalleled performance.

Contact Diffraction Technology , Rod Clapp, diffraction@bigpond.com,



Nano-inXider, SAXS made easy

Xeuss 2.0, the SAXS/WAXS laboratory beamline

Our mission : to provide solutions for
nanoscale characterization of materials

With over 16 years of acknowledged expertise in X-ray technology, Xenocs provides cutting edge solutions in nanocharacterization. Strengthened by a worldwide distribution network, our team of experts is committed to answering your individual needs.
www.xenocs.com

 **xenocs**
Exploring the very small

Premium Standards Produced for Handheld, Desktop and Laboratory XRF's



Resource Reference Materials (Pty) Ltd (RRM) is an international organization focused on and committed to producing the best possible standards for handheld, desktop and laboratory XRF's for the compliance needs of the global resources industries.



- RRM provides a comprehensive service to end users of XRF instruments; from handheld, desktop and more advanced laboratory spectrometers.
- Manufacture project specific standards and/or certified reference materials, from your materials, for calibration and performance monitoring of your instrument.
- We ensure that all individual CRM's samples supplied to our clients are as representative as possible to the analysed batch.
- Our batches are prepared and sized to the specified PSD and then divided into sub-samples through a series of specially designed Rotary Sample Dividers (RSD's).
- RRM carries out the preparation and homogeneity testing of pressed pellets and fused beads, from materials provided by you or sourced by us.
- We provide assistance with method validation and training in safe and effective use of hand held analysers.

36 Michelson Road, Anderbolt, Boksburg, 1459
PO Box 6814, Dunswart, 1508, South Africa

Tel: +27 87 135 0374 E-mail: info@resourcereferencematerials.com

www.resourcereferencematerials.com

RRM
RESOURCE REFERENCE MATERIALS



PRESS RELEASE

SOLUTIONS FOR SCIENCE AND INDUSTRY | MATERIALS SCIENCE | LIFE SCIENCE | MINING | NDT |

Lyncean Technologies Signs AXT Pty Ltd as Representative in Australia and New Zealand

Sydney, Australia, March 14, 2017 - Lyncean Technologies, Inc., manufacturer of the Lyncean Compact Light Source (CLS), today announced the signing of AXT Pty Ltd as their exclusive representative in Australia and New Zealand. AXT will be responsible for growing the academic research market for Lyncean as well as providing front line service and operational support for future installations.



The Lyncean Compact Light Source, a laboratory based, mini-synchrotron for production of high brilliance radiation.

Synchrotrons are stadium-sized facilities providing a high brilliance radiation source increasingly indispensable across nearly all areas of scientific investigation. These range from areas as diverse as protein structure determination, medical research and therapy through to areas such as advanced material engineering, nanotechnology, geology and archaeology.

Synchrotrons require massive infrastructure investments and a significant number of highly technical support staff. Lyncean have created the Compact Light Source (CLS), a system 200 times smaller, yet comparable in light intensity to a synchrotron and is designed to be operated by a postdoc, graduate student or beamline scientist.

The CLS fits in a typical laboratory space allowing the facility to be localized and more easily accessed by more researchers. Unlike conventional laboratory sources, the CLS creates a narrow beam of nearly monochromatic X-rays which are adjustable in energy, a characteristic feature unique to synchrotron radiation and is suitable for numerous imaging, diffraction, fluorescent, and scattering experiments carried out at synchrotron facilities.

“AXT was really our first choice for representing Lyncean in Australia and New Zealand. Their expertise in both x-ray generation devices and x-ray applications is extremely unusual for a manufacturer’s representative,” said Lyncean CEO Dr. Michael Feser. “Additionally, their longevity, reputation for excellent customer support, and vast customer base is second to none in that region.”

“We are excited to represent Lyncean and see a tremendous potential for the Lyncean Compact Light Source as a complement to the Australian Synchrotron,” said Richard Trett, Managing Director at AXT Pty Ltd. “Both university researchers and beamline scientists at the synchrotron have voiced the desire for a regionally located, laboratory based source. It provides a complementary capability, additional beamline capacity, and could be used for optimizing experiments. It also opens up whole new areas of science in particular to experimentalists unable to travel with their experiments or who can’t gain access to the required time on beam lines.”

Press Release

Rigaku Launches the SmartLab SE Multipurpose X-ray Diffractometer with Built-in Intelligent Guidance

Rigaku Corporation
3-9-12, Matsubara-cho
Akishima-shi, Tokyo 196-8666, JAPAN

Rigaku introduces new multipurpose X-ray diffraction system with built-in intelligent guidance to optimize hardware configuration and settings for specific application measurements

April 3, 2017 – Tokyo, Japan. [Rigaku Corporation](#) is pleased to announce the release of the [Rigaku SmartLab SE](#) system, a highly versatile multipurpose X-ray diffractometer with built-in intelligent guidance. The SmartLab[®] SE system offers continued refinement of the ease-of-use features that enabled the original SmartLab diffractometer to receive the coveted R&D 100 Award in 2006: automatic alignment, component recognition, cross beam optics and a 2D detector.



Award-winning guidance software recognizes installed components and seamlessly integrates them into data collection and data analysis methods. The cross beam optics module offers permanently mounted, permanently aligned and user selectable optical geometries for various diffraction experiments. As an example, one can choose a Bragg-Brentano and parallel beam combination for measurements of both powders and thin films without the need for instrument reconfiguration. One could also choose a Bragg-Brentano and focusing transmission combination to measure organic materials in both transmission and reflection modes.

The SmartLab SE system further extends application capability with the next-generation HyPix[™]-400 2D detector. This hybrid pixel array detector offers the highest resolution and count rates available today. It is manufactured and fully integrated into the SmartLab SE system by Rigaku and, as such, offers the superior ease of use pioneered by Rigaku in the original [SmartLab](#) diffractometer. The SmartLab SE system configured with a HyPix-400 detector operates in 0D, 1D, and 2D modes without the need to exchange the detector.

MAKE THE **SMART** MOVE TO THE **POWDER DIFFRACTION FILE**

ICDD databases are the only crystallographic databases in the world with quality marks and quality review processes that are ISO certified.

- S** Standardized data
- M** More coverage
- A** All data sets are evaluated for quality
- R** Reviewed, edited and corrected prior to publication
- T** Targeted for material identification and characterization

Featuring over
848,000
unique entries

Visit ICDD's Booth at the 2017
Australian X-ray Analytical Association Meeting

*Celebrating 75 Years of
Serving the Scientific Community*



www.icdd.com | marketing@icdd.com

ICDD, the ICDD logo and PDF are registered in the U.S. Patent and Trademark Office. Powder Diffraction File is a trademark of JCPDS—International Centre for Diffraction Data ©2016 JCPDS—International Centre for Diffraction Data - 12/16

ICDD 2016–2017 Product Summary

Data Entry Source	PDF-2 2016	PDF-4+ 2016 WebPDF-4+ 2016	PDF-4/ Minerals 2016	PDF-4/ Organics 2017
00- ICDD	115,066	115,066	12,031	39,395
01- FIZ	165,264	67,498	12,294	12,185
02- CCDC	0	0	0	431,359
03- NIST	10,067	2,960	216	281
04- MPDS	0	198,367	19,748	0
05- ICDD Crystal Data	722	722	52	32,785
Total No. of Data Sets	291,119	384,613	44,341	516,054
Subfile Distribution:				
Inorganic	258,130	351,612	44,285	33,943
Organic	41,386	42,229	701	505,530
New Entries	12,616	18,736	1,489	14,090
Rietveld—No. with atomic coordinates	0	271,449	33,574	96,825
Reference Intensity Ratio (RIR)— I/I_0	193,567	286,885	33,362	484,021
Experimental Digital Patterns	0	11,287	127	6,062
Pattern Fitting—Calculated Digital Patterns	0	384,613	44,341	516,054

All ICDD databases combine the power of both powder diffraction and crystal structure reference data. We are the only crystallographic database in the world with quality marks and quality review processes that are ISO certified. Each PDF database includes our integrated data mining software.

PDF-2 2016

Quality + Value

- Designed for rapid, accurate phase identification
- Cost effective license (licensed for 5 years + one optional 5 year license extension)

PDF-4+ 2016

Identify and Quantitate

- Designed for phase identification and quantitative analysis
- Features digitized patterns, molecular graphics, and atomic coordinates
- Data simulation programs enables the analysis of X-ray, neutron, electron, and synchrotron data

WebPDF-4+ 2016

Data When and Where You Work

- Provides portability to the PDF-4+ via the internet
- Equivalent to PDF-4+

PDF-4/Minerals 2016

Size Does Matter

- The most comprehensive collection of mineral data
- 44,341 minerals and related materials
- Includes all the features of PDF-4+

PDF-4/Organics 2017

Solve Difficult Problems, Get Better Results

- Highly targeted collection of materials used in commercial and regulatory fields
- Largest collection of pharmaceuticals, excipients, and polymers
- Includes ICDD's search-indexing software, Sleve+, as an added value

All PDF-4 products are licensed for one (1) year. If you are concerned about yearly budgets, ICDD offers multi-year licenses that allow you to prepay for future renewals. These licenses are discounted and alleviate budget concerns. You must have a current release of the database in order to purchase a multi-year license.

Multi-year and site licenses are available for: PDF+2, PDF-4+, WebPDF-4+, and PDF-4/Organics.

Customers may convert a current PDF-2 license to a PDF-4+ or WebPDF-4+ using renewal pricing.

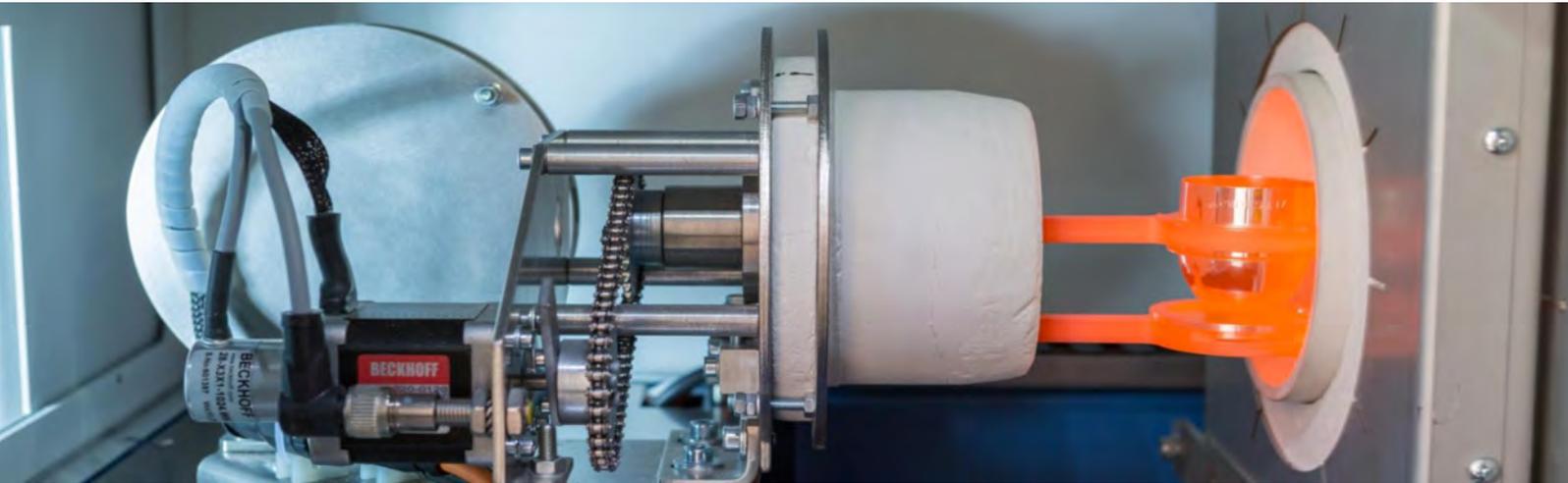
Visit ICDD's Booth at the 2017
Australian X-ray Analytical Association Meeting



www.icdd.com | marketing@icdd.com

ICDD, the ICDD logo and PDF are registered in the U.S. Patent and Trademark Office. Powder Diffraction File is a trademark of JCPDS—International Centre for Diffraction Data
©2016 JCPDS—International Centre for Diffraction Data – 12/16

New Herzog Bead One R - The Standard in Sample Preparation for XRF Fusion



The Herzog Bead One R combines highly repeatable and accurate analysis results with easy-to-use interfaces and maximum safety measures. Precisely controlled temperature and fusion parameters as well as the optional automatic magazine makes the Bead One R the future-proof instrument for your analytical needs.



Analytical Flexibility

The Bead One R prepares glass beads for XRF analysis, borate or peroxide solutions for AA and ICP analysis. The fusion process can be controlled by parameters such as temperature, duration, heating rate and crucible rocking speed. After melting, the material can be either discharged into the casting dish or remain in the crucible until solid. Alternatively, the melt can be poured into an acid solution cup, which is positioned on a magnetic stirring device.



The Bead One R is able to perform different sample preparation processes in an inert gas or oxygen atmosphere.

At a Glance

- Benchtop fusion instrument (resistance heating technology) for preparation of glass disks for XRF as well as borate and peroxide solutions for AA and ICP analysis.
- Highly accurate and precise analysis results for a wide range of different applications.
- High-quality furnace (max. operating temperature 1350°C) with optimized design and high-precision control for excellent fusion conditions.
- Optional magazine for automatic and completely unmanned processing of up to nine samples allows the operators free time to focus on other tasks.
- Maximum safety measures including safety door locking and cold-to-cold operation for Bead One R and the magazine.



IMP Group Australia
Tel: +61 (8) 9204 4200
Fax: +61 (8) 9204 1128
E-mail: info@impgroup.com.au
www.impautomation.com

**Challenging Conventional
Sample Processing!**

IMP
Innovative Solutions