

e-newsletter

Issue 1, 2013

Australian X-ray Analytical Association

President's Address

Dear AXAA Friends and Members,

Summer has come and gone and we are looking forward to some much needed relief from what has been a very hot season. Things at AXAA central have been running hot too, with our Program Advisory Committee for the AXAA-2014 event meeting twice, once in Melbourne and once in Sydney, to plan what is sure to be a great event. In 2014 we look forward to the event being hosted in Western Australia, which in addition to our academic members, has strong industrial representation which the 2014 program will reflect. We are pleased to announce that the event will be held at the Pan Pacific in Perth from Sunday 9 to Thursday 13 February 2014. Accordingly, our XRF and XRD basic workshops for new practitioners will have more of an applied focus in 2014. If you have interest in holding a pre or post workshop as a satellite to the main event, now is the time to contact us. Similarly, if members want to see something specific in the program we also greatly appreciate this information.

Now is also the time to consider nominations for the Keith Norrish AXAA Award for Excellence in X-ray Fluorescence Analysis, and the Bob Cheary AXAA Award for Excellence in X-ray Diffraction Analysis. Read on for further details.

Vanessa Peterson
National Council President

AXAA 2014 Workshops, Conference and Exhibition

(see attachment accompanying the Newsletter for full event flyer)

9–13 February 2014, Pan Pacific Hotel, Perth, WA



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KEY DATES

Abstracts Open	• May 2013
Registration Open	• July 2013
Abstract Close	• September 2013
Earlybird Registration Closes	• November 2013

AXAA 2014 • Workshops, Conference and Exhibition

from minerals to materials

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To register your interest, submit an abstract, and for further information please visit

www.axaaconference.info

AXAA Awards for Excellence in X-ray Analysis: Call for Nominations

Closing Date for Submission of Nominations
25 October 2013

The Awards

Two awards have been established, one for XRF and one for XRD. These will be for “significant long term contributions” to x-ray analysis rather than say a single paper, and will perpetuate the contribution of the person after whom the award is named.

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

XRD – Bob Cheary AXAA Award for Excellence in X-ray Diffraction Analysis

Form of Awards

Each award will comprise an engraved medal.

Selection Criteria

1. The principal criterion will be the excellence of the applicant's development of high-impact, innovative x-ray analysis methods and their take-up by the x-ray analysis community. Work in which XRF or XRD has been a peripheral tool will not be considered.
2. The period over which the contribution is to be considered will be at least 5 years.
3. All or most of the cited work will have been conducted in Australia.
4. The recipient will have been a member of AXAA for at least 5 years prior to the application being submitted.
5. It is desirable, but not essential, that the applicant has contributed to AXAA in a substantial way, for example through quality presentations at AXAA national conferences and/or administrative service for AXAA.
6. Past recipients of an AXAA XRD or XRF award will not be considered for a second award in the same category.

Applications

Applications will be submitted by a nominator on behalf of the applicant. The documentation will comprise:

- CV.
- Publication list. This may include items protected by confidentiality if the applicant can pre-arrange an appropriate confidentiality agreement.

- Advocacy statement highlighting the application's alignment with the selection criteria.
- Names and contacts for three technical referees, one being the nominator.
- Applications are to be submitted in electronic form to the AXAA President – Vanessa Peterson. Please send to Vanessa as an attachment:
vanessa.peterson@ansto.gov.au

Selection Process

1. The National Council will appoint a selection panel of three persons for each award. The selection panels will be allowed approximately two months to review the applications and make recommendations.
2. The recommended recipients will be considered by the AXAA Council which will then make a formal decision on the recommendations. Decisions by the Council will be final, and there will be no appeal process.
3. The Council reserves the right not to make an award if the standard of applications is deemed to fall below the expected standard.

Upcoming Events

1. National XRD Course

X-ray Powder Diffraction Analytical Methods,
Curtin University, Perth
Sat, 6 July – Tue, 9 July 2013 (NOTE REVISED DATES)

Venue: Department of Imaging and Applied Physics, Curtin University, Bentley (Perth), Western Australia. [Client-specific version of the course can be presented at the customer's site].

Duration of Curtin Course: 4 days.

Dates: 6 July – 9 July, 2013

Course Director: Professor Brian O'Connor.

Course Presenters: Professor Brian O'Connor and Dr Catherine Kealley.

Enquiries and further information:

B.O'Connor@curtin.edu.au

Cost: \$2,695 including GST.

Availability of places strictly limited.

Overview: The course has been designed to give participants a theoretical and practical grounding in the

principal characterisation methods which make use of x-ray powder diffractometry data. Approximately 60% of the course involves hands-on instruction. Participants personally collect diffractometry data sets and then process these, both manually and with PC computers, in exercises on various analytical methods, including Rietveld analysis. Public domain software will be used, including *WINPLOTR* and *Rietica*. The course also includes overviews and demonstrations of the commercial software packages *X'Pert HighScore Plus* and *Diffracplus Topas*. While the course is relevant to the analysis of all classes of crystalline materials, attention is devoted mainly to materials relevant to the mining and mineral processing sector.

2. Internet XRD (Basic) Course

Available from April 2013

This course has been developed primarily in response to industry requests. It provides XRD analysts, particularly those new to the field, with on-site instruction on the practical principles of powder XRD for materials analysis.

Features of the course include –

- 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 10 modules, with an assignment being set for each module.
- Feedback on the assignments provides excellent mentoring.
- May be used as a vehicle for in-house XRD training.

Overview: The course has been designed to give new XRD practitioners a grounding in the use of powder XRD for materials analysis, with particular reference to data measurement, phase identification and quantitative phase composition analysis. It provides an excellent grounding for those wishing to proceed to more advanced XRD characterisation methods using techniques such as Rietveld analysis.

Course availability: from April 2013.

Course Director: Dr Brian O'Connor.

Course fee: \$2,695 including GST.

Further information and enrolment:

brian_oconnor@iprimus.com.au (Tel 08 9291 7067)

3. Internet XRF Course: Series 6, 2013

The course provides XRF analysts, particularly those new to the field, with on-site instruction in the practical principles of wavelength dispersive XRF. Features of the course include –

- 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 11 modules; with an assignment being set for each module.
- Feedback on the assignments provides excellent mentoring.

The course now has a substantial number of international participants, as well as Australians, and is being used by companies as a vehicle for in-house XRF training.

Course availability: There are **6 places available** as of the end of February 2013.

Course director: Dr Brian O'Connor.

Course fee: \$2,695 including GST.

Further information and enrolment:

brian_oconnor@iprimus.com.au (Tel 08 9291 7067)

Membership Matters

AXAA-Inc membership is for the 3-year period starting from the 2011 AXAA National Conference (existing membership will be re-approved in 2014). Membership is free. Candidates should provide a brief CV and a short statement of intention about what they intend to do in the organisation. Please send these to National Council Secretary Natasha Wright. The council votes on membership applications at least once every 6 months.

AXAA Contacts <http://www.axaa.org/>

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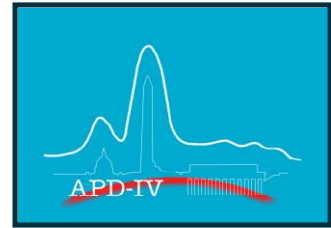
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APD-IV

Accuracy in Powder Diffraction



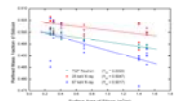
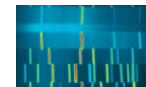
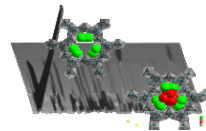
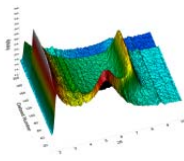
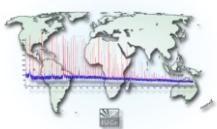
NIST
National Institute of
Standards and Technology
U.S. Department of Commerce

- We are pleased to announce the location and dates for our next *Accuracy in Powder Diffraction* meeting.

- The meeting will comprise :

- A review of the state-of-the-art in:
 - ❖ Powder diffraction metrology and methodology
 - ❖ Instrumentation, and
 - ❖ Data analysis methods.
- A program of invited presentations
- A contributed poster session
- An exhibition area for leading instrument manufacturers and providers

Supported by the IUCr
Commission on Powder Diffraction



- Where

- NIST - Gaithersburg, MD, USA

- When

- 22nd – 25th April, 2013

- Target audience

- Industry, Government, Academia

- Planned sessions for APD-IV

- Standards
- Instrumentation
- Data Collection and Analysis
- Structure Determination and Refinement from Powder Data
- In situ Studies
- Quantitative Phase Analysis
- Proteins & Pharmaceuticals
- Mineralogical Applications
- Pair Distribution Studies and Total Pattern Analysis
- Stress / Strain
- Where to from here?

- Conference Co-chairs

- James Cline, NIST, USA
- Jeffrey Post, Smithsonian Institution, USA

- Technical Organizing Chair

- Ian Madsen, CSIRO, Australia

- How do I register ?

- Through the conference website
www.nist.gov/mml/apdiv_conference_2013.cfm

Non U.S. citizens please note:

All foreign national visitors MUST register at least 2 weeks prior to the meeting. Failure to do so will result in significant delays (up to 24 hours) in entering the facility.

Diffraction Technology

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The **GBC EMMA** – an ideal high resolution powder diffractometer for routine and transportable applications – A full range of software including ICDD® databases is available.



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The unique **Diffraction Technology XMR** – high powered micro radiography using an XRD tube. Magnification up to 4 x. Fully enclosed and can be used with an existing X-ray analysis generator.

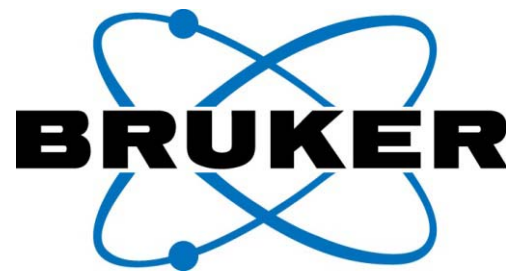


Optics, polycapillary and mirror,
Detectors
Si PIN diode, Xe proportional.



- X-ray WorX 160kV microfocus X-ray tubes with reflection and /or transmission targets.
- Reflection – JIMA resolution 2 μm , Max. target power 300 W, Max. tube power 350 W.
- Transmission – JIMA resolution 0.8 μm , Max target power 10W, Max tube power 80W.

Diffraction Technology e-mail diffraction@bigpond.com phone 03 9787 3801 Web www.diffraction.com.au



N8 HORIZON - An Innovative, Compact Small Angle X-ray Scattering System for Advanced Materials Research

Last November at the International Small-Angle Scattering Conference in Sydney (<http://sas2012.com>), Bruker announced the launch of the N8 HORIZON Small- and Wide-Angle X-ray Scattering (SAXS and WAXS) system for materials research applications.

The new N8 HORIZON features an innovative and compact vertical instrument design and as a consequence provides advantages over conventional horizontal SAXS systems, such as ease-of-use, convenient sample handling, small footprint, and low cost-of-ownership. The N8 HORIZON is a powerful tool for both high-end research and for multi-user facilities investigating a variety of nano-materials from solid bulks, to fibers, surfaces or biological samples.



The N8 HORIZON is equipped with advanced technologies to achieve high data quality with short measurement time. The latest μ STM micro-focus compact X-ray source boosts the intensity of the X-ray beam at the sample. The large 2-dimensional VÅNTEC-500™ detector based on the proprietary MIKROGAP™ technology features quantum-limited sensitivity to detect even weak SAXS signals. The revolutionary new SCATEX™ scatter-free pinholes set new benchmarks in terms of X-ray beam quality and enable high flux on the sample with improved signal-to-noise.

The N8 HORIZON addresses many requirements of a multi-user facility. Novel features, such as intelligent screen-keys for intuitive operation, ergonomic sample loading, a small footprint, and an integrated camera for quick and easy sample positioning maximize the ease-of-use and keep the learning curve for operating the instrument short. Low power consumption, no water cooling and no requirements concerning external infrastructure ensure low cost of ownership.

“The N8 HORIZON follows the Bruker philosophy of combining high technical sophistication with ease-of-use, and will bring SAXS beyond the expert level into the standard laboratory,” stated Dr. Geert Vanhoyland, Product Manager SAXS at Bruker AXS. “SAXS is a key method for characterizing nano-materials in their native environment, or under non-ambient conditions. It provides global, statistically relevant insight into the 3-dimensional nano-structural properties of new materials like catalysts, liquid crystals, etc. Moreover, SAXS is non-destructive and requires virtually no sample preparation that could influence the sample properties.”

“The N8 HORIZON perfectly fits into our successful Bruker SAXS portfolio, as this new system will further strengthen Bruker’s position as the leading SAXS company by expanding the market potential into applications which never used SAXS before,” commented Professor Dr. Peter Laggner, the Director for Nanostructure Solutions at Bruker AXS.

For further information, contact Bruker Biosciences: Ph (03) 9474-7000 or email: baxs@bruker-axs.com.au

ScatterX⁷⁸ for nanomaterials analysis – a new SAXS/WAXS attachment to Empyrean



On the 15th International Small-Angle Scattering Conference (SAS-2012) that took place in Sydney (Australia) during Nov. 18-23 2012, PANalytical launched ScatterX⁷⁸, the latest add-on to its Empyrean multi-purpose XRD platform.

ScatterX⁷⁸ is a compact and ergonomic SAXS/WAXS attachment based on patented technology. It consists of a chamber that houses advanced modules for the conditioning of the X-ray beam and a variety of sample holders. The whole chamber is evacuated and thus allows for quick and sensitive small-angle X-ray scattering (SAXS) measurements even on weakly scattering and highly dilute samples. With ScatterX⁷⁸ these measurements can be extended to scattering angles up to 78 degrees. The wide-angle X-ray scattering (WAXS) signal provides valuable complementary information about the atomic order in a material.

Together with PANalytical's PIXcel area detectors, ScatterX⁷⁸ also allows performing 2D SAXS measurements, which is important for the analysis of anisotropic samples.

SAXS is a versatile technique that is used for the quantification of nanoscale dimensions and for the analysis of nanostructures. It is applicable to virtually all types of nanomaterials, such as liquid nanoparticle dispersions, nanopowders, nanocomposites and mesoporous materials. The method is also increasingly used for the structure analysis of biomacromolecules (BioSAXS).

Advanced SAXS measurements normally require dedicated and often large instrumentation that tend to be very expensive and difficult to use. Thus the technique has for a long time been only accessible to experts in the field. With the ScatterX⁷⁸, being a particularly easy-to-use, alignment-free add-on to a widely used multi-purpose XRD platform, the technique now becomes available as an advanced, yet cost-effective research tool for nanomaterial research laboratories.



The new ScatterX⁷⁸ and PIXcel^{3D} 2x2 area detector, mounted on the Empyrean multi-purpose X-ray diffractometer platform from PANalytical .

For further information, visit: www.panalytical.com or contact your local PANalytical representative.

About Empyrean

Empyrean is a true multi-purpose, high-end research diffractometer. Like no other system available, the Empyrean platform is designed for now, and for years to come. It is PANalytical's answer to the challenges of modern materials research, where the lifetime of a diffractometer is considerably longer than the horizon of any research project.

About PANalytical

PANalytical is one of the world's leading suppliers of analytical instrumentation and software for X-ray diffraction (XRD) and X-ray fluorescence spectrometry (XRF). The materials characterization equipment is used for scientific research and development, for industrial process control applications and for semiconductor metrology.

During the last decade PANalytical has added tailor-made a variety of other analysis techniques solutions to their product portfolio. Optical emission spectrometry (OBLF GmbH, Germany), thermal neutron activation (Sodern, France) and near- infrared (ASD Inc.) capabilities together with XRD and XRF can provide customers with tailor-made analytical solutions for the characterization of a wide range of products such as cement, metals, nanomaterials, polymers and many more.

PANalytical's headquarters are in Almelo, the Netherlands. Fully equipped application laboratories are established in Japan, China, the USA, and the Netherlands. PANalytical's research activities are based in Almelo (NL) and on the campus of the University of Sussex in Brighton (UK). Supply and competence centers are located on two sites in the Netherlands: Almelo (development and production of X-ray instruments) and Eindhoven (development and production of X-ray tubes). A sales and service network in more than 60 countries ensures unrivalled levels of customer support. The company is certified in accordance with ISO9001-2008 and ISO 14001.

Visit our website at www.panalytical.com for more information about our activities.

PANalytical is part of Spectris plc, the productivity-enhancing instrumentation and controls company.

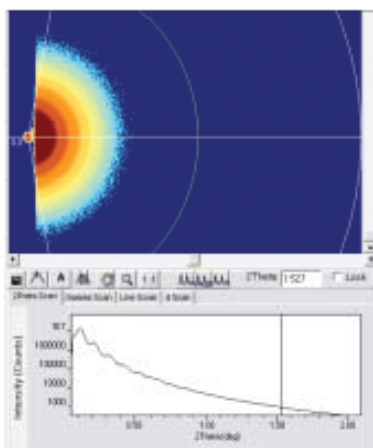
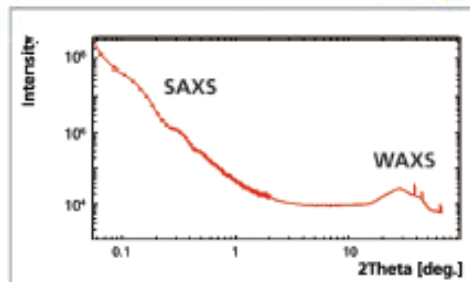
SCATTERX⁷⁸

High-performance SAXS/WAXS attachment

Developed for Empyrean, our multi-purpose diffractometer

Challenging conventions

- Add-on to XRD platform
- Compact and ergonomic
- Alignment-free
- Very easy to use
- Accessible range: 0.08 to 78 deg.
- 2D SAXS option
- EasySAXS software
- Highly cost-effective



Nanostructure analysis

- Colloidal dispersions
- Surfactants
- Bio-macromolecules
- Polymers
- Liquid crystalline phases
- Nanocomposites
- Nanopowders
- Porous materials





AXT OPEN DEMO LAB

Applications & Sample Prep Laboratory

AXT is pleased to invite those interested in new applications of analytical and imaging technologies to our open days. We are open all week for general product introductions as well as more in-depth organised hands on demonstrations by appointment.

- ROCKLABS: ring mill
- SPEX: X-Press fully automatic powder press
- SPEX: Genogrinder high-throughput plant & tissue homogenization
- KATANAX: K2 Prime automatic electric XRF fusion
- CKIC: Dual furnace TGA (separate volatile furnace)
- HAVER & BOECKER: CPA Optical particle seizer
- HIROX: 3D Digital microscope
- TESCAN: TIMA automated mineral analyser
- TESCAN: Software demo and live 3D imaging
- RIGAKU: NexQC value EDXRF
- RIGAKU: NexCG high performance EDXRF
- RIGAKU: SUPERMINI Benchtop WDXRF
- RIGAKU: Primus III 3kW WDXRF superb value/performance
- RIGAKU: Benchtop Miniflex XRD
- RIGAKU: Smartlab XRD Guidance (offline software demo)

Presentations

XRADIA: DEVELOPMENTS IN X-RAY TOMOGRAPHY

Next generation XCT for mineral differentiation and in-situ experimentation

TESCAN: NANO SCIENCE WORKSTATION

The latest R&D developments. Including plasma FIB, TOFSIMS and AFM integrated SEM's



AXT OPEN DEMO LAB

Venue: Unit 1 / 3 Vuko Place
Warriewood NSW 2102

Contact: Sarah Touman

Email: sarah.touman@axt.com.au

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