



# e-newsletter

Issue 1, March 2011

## President's address

Welcome to the first AXAA newsletter for 2011! This Newsletter is so action packed we have had to be brief in many of the items within, so further detail may follow in future newsletters when we have a bit more space.

First and foremost, the new National Council was formed at the AGM, held at our 2011 workshops, conference, and exhibition event. I remain as your current President, and I give my warmest welcome to the rest of our Council, Gordon Thorogood (ANSTO) - our new Treasurer, and Natasha Wright (CSIRO) - our new Secretary. I also welcome Nathan Webster (CSIRO) as our new Newsletter Editor - his first edition is certainly an event! For those of you not present at the AGM (or the conference dinner), a big and sincere thank you to all our outgoing Council members.

Things will be a bit quieter this year as we have a small break from the excitement of the 2011 workshops, conference, and exhibition, which I think everyone will agree was a huge success (read on for full details). We will begin ramping up our activities again with state events to be held in 2012.

Last but not least, our membership rules have changed significantly – please read further on for details – as a result of our recent incorporation. The Council has decided that an overhaul of the membership was long overdue, and with all the new memberships coming in from the 2011 event, we thought what a great time for our new Secretary to get things in order!

We thank you for your support and hope that you will continue to provide this support to our new Council.

Vanessa Peterson  
National Council President

## Editorial

2011 was brought in with a bang with the AXAA 2011 conference. What a fantastic week and congratulations to everyone involved in the organisation and running of the event.

We hope you enjoy our first newsletter for 2011. It is my first as Editor and I've tried to add a touch of my own creative flair with a new layout. Given the amount of stuff to get through in this edition I'll keep my musings short, but I would like to take this opportunity to say a big thank you to Cat Kealley who has helped me out enormously with templates, contacts, ideas and advice, making the job of compiling my first newsletter easy. I would also like to thank those people who contributed articles who, again, have made my job easy.

Nathan Webster  
Newsletter Editor

Australian X-ray Analytical Association

## AXAA 2011 Workshops, Conference and Exhibition – Wrap Up

6-11 February 2011

Star City, Sydney NSW

The organizing committee for AXAA 2011, along with Sarah and Jane from Tulips Meetings Management, deserve a huge vote of thanks for putting together a great conference this year. The gamble of holding the event at Star City really paid off (yes, pun intended). AXAA 2011 will be remembered for both the breadth and depth of scientific presentation, along with an ideal venue, excellent social functions and a great sense of scientific camaraderie. The Conference kicked off with 2 days of basic and advanced workshops, which have always been a popular adjunct to the AXAA events. Amongst a raft of presenters, Ken Turner and Sharon Ness (XRF), and Rob Hart, Ross Williams and Tim Fawcett (XRD) deserve special thanks for a great job well done.



(Left) A plenary session in Ballroom 2; and (right) Delegates enjoy a welcome mixer in the exhibition hall.

Right from the outset of the Conference, the first of the Plenary speakers (Prof. Philip Potts from the Open University, Milton Keynes) gave us some indication of the high standard of talks yet to come. Particularly memorable to this reviewer was the talk by Prof. Dave Bish (Indiana University, Bloomington, Indiana) on Remote X-Ray Powder Diffraction on Mars. Stirring stuff indeed!



Plenary presenters Prof. Philip Potts (The Open University, Milton Keynes, UK) (left); and Prof. Daniel Chateigner (IUT-Caen, Université de Caen Basse-Normandie, France) (right).

One sign of the high standard of presentations at a conference is the level difficulty in choosing between parallel talks at concurrent sessions, and this was indeed the case at AXAA 2011. The miniature program booklet with our name tag holders was a great help in moving between the two or three session streams. Overall, the grouping of presentations into carefully selected topic sessions, along with a number of invited speakers in each of these sessions, led to an impressive selection of topics and presenters. This was also reflected in the poster presentations

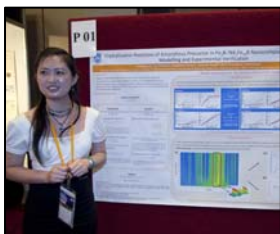
A particular highlight of the Conference was the presentation of both the Bob Cheary Award (XRD) and the Keith Norrish Medal (XRF). The former was presented by the last recipient, Ian Madsen, to Brian O'Connor, with Arie van Riessen accepting the award on Brian's behalf. Brian was unfortunately unable to attend in person (the first time for many years that Brian has not made it to an AXAA Conference) and his presence was sorely missed. Ken Turner was the well deserving and popular recipient of the Keith Norrish Medal, presented by Damian Gore.



(Left) Ken Turner receiving the Keith Norrish Medal from Damian Gore; and (Right) Arie van Riessen accepting the Bob Cheary award on behalf of Brian O'Connor.



A number of student prizes, sponsored by PANalytical, Bruker Biosciences Pty Ltd, CSIRO and ANSTO, were also awarded: Chantelle Driever (University of Melbourne/CSIRO) won the Bruker XRD Oral prize; Vanalysa Ly (Monash University) won the CSIRO award for best XRD poster; Jessica Chadbourne (University of Sydney) won the ANSTO award for best use of ANSTO facilities; Gil Davis (Macquarie University) won the PANalytical XRF oral prize; and Rory Williams (Macquarie University) won the CSIRO award for best XRF poster. Congratulations to all our student winners for exceptional work.



(Top left) Chantelle Driever accepting her award from Bruker's Chris Kelaart; (Top middle) Jessica Chadbourne accepting her award from Gordon Thorogood; (Top right) Gil Davis receives his award from PANalytical's Tony Larkin; (Bottom left) XRF poster prize Rory Williams; and (Bottom right) XRD poster prize winner Vanalysa Ly.

On a sad note, Nicola Scarlett presented a moving tribute to our colleague, Lachlan Cranswick who was tragically taken from us in early 2010. Lachlan had been an enthusiastic and vibrant contributor to AXAA for many years and his presence is sadly missed. Vale Lachlan Cranswick.

The conference concluded with a visit to the OPAL reactor facility at Lucas Heights. The high number of neutron related papers at AXAA 2011 is noteworthy (perhaps we should consider a change to AXNAA although I guess that's for another forum, another time). This proved a spectacular and impressive end to the conference and, judged by the number of "oohs" and "aahs" was well appreciated. All in all, AXAA 2011 was a great success and a great credit to Vanessa and her team. Well done, and roll on AXAA 2014.

David Hay  
CSIRO



(Top left) Delegates enjoying a pre-dinner drink at Waters Edge restaurant (Top right) Some happy delegates at dinner; (Bottom left) Our president relaxing after a hectic week; and (Bottom right) Gordon Thorogood accepting the AXAA cheque book from outgoing treasurer Rob Hart.

## 7<sup>th</sup> TOPAS User's Meeting

Darling Harbour, 5-6 February 2011

The TOPAS users' meeting, held at the Novotel Sydney Darling Harbour, was a highly informative and interactive small user meeting. A diverse range of participants attended, from beginners to experts, academic to industry and everyone in between. Arnt Kern (Bruker, Germany) presented on the basics of TOPAS operation and led a number of tutorials on topics such as profile fitting, Rietveld quantitative phase analysis and structure determination methods. These were complemented by user presentations on advanced applications relating to quantitative phase analysis, *in situ* quantitative phase analysis, general XRD methodology, crystallite size and other profile fitting, NIST standard reference material certification, various methods on amorphous content quantification and modelling of energy dispersive XRD data. There was wide consensus that the TOPAS workshop was an informative and valuable meeting and a great introduction to the AXAA Conference. I would like to whole heartedly thank the organisers, Chris Kelaart and Arnt Kern, for organising another terrific user meeting.

Ross Williams  
Curtin University



# ARPANSA Reclassify X-ray Instruments

Dear AXAA members,

This is my first article as the new treasurer and it is not about money. I gave feedback on the following information at the AGM at AXAA 2011 and I was asked to write a summary for the newsletter. You may or may not know I work for ANSTO and as such we are regulated by ARPANSA (Australian Radiation Protection and Nuclear Safety Agency). First some background; recently we started the process of acquiring two second hand single crystal instruments from a research partner. During the process the transfer was stopped, as the state regulator overseeing the transfer had classed the units as partly enclosed and ANSTO did not possess a licence for partly enclosed units at the time. This however initiated a review of all of our instruments by ARPANSA and with our PANalytical X'pert Pro and Bruker D8s being reclassified from fully to partly enclosed units. They interpreted a section from the code of practice relating to incident beam collimation to mean that the entire beam path must be enclosed by the collimator in addition to the goniometer being enclosed in the cabinet. This was a surprise to us given our instruments had been previously classed as fully enclosed by ARPANSA. According to the code of practice an instrument being classed as partially enclosed meant potentially reworking the way we handled our units. We are currently working through this new classification with ARPANSA.

Recently ANSTO and the manufacturers of X-ray analytical equipment were asked to comment of ARPANSA's attempt to rewrite the code of practice into the RPS No. 6 - National Directory for Radiation Protection (NDRP). If you wish to look at it go to <http://www.arpansa.gov.au/Publications/codes/rps6.cfm>. Upon reading the document we were concerned with the contents as it was essentially a cut and paste of the code of practice which had been written in the 1980s and so was severely out of date with current instruments. Some of the wording had also been changed so that one way of interpreting it was that a fully enclosed unit would require a beam stop even though the instrument was fully enclosed. To my knowledge very few modern instruments are built this way as the cabinet serves to fully contain the primary beam. Due to the documents lack of ability to adequately describe modern X-ray analytical instruments ANSTO has asked ARPANSA that the code be fully reviewed with the consultation of both users and manufacturers. Submissions on the document were due by 18<sup>th</sup> March and so everybody has hopefully commented constructively if given the opportunity. Once ANSTO has been informed I will inform all of you through the newsletter as to what has transpired and if any input will be required.

Gordon Thorogood  
National Council Treasurer

## Membership Matters

The new council have formed new rules regarding our membership following the recent incorporation of AXAA-Inc. All applications for membership made during the period leading up to the AXAA-2011 event were successful, however the following procedure applies to all new memberships: membership will be for 3 years and is free but new members will be voted in by the Council. Candidates should provide their CV, a nomination letter from an existing AXAA member, and a short sentence about what they intend to do in the organisation. Please send these to National Council Secretary Natasha Wright (contact details overleaf) if you would like to apply.

## Upcoming events

### National XRD Course *X-ray Powder Diffraction Analytical Methods*, Curtin University, Perth Sat, 10 Sep – Tue, 13 Sep, 2011

**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

10-13<sup>th</sup> September 2011

**Course Presenters:** Professor Brian O'Connor and Dr Robert Hart

**Enquiries and further information:**  
[B.O'Connor@curtin.edu.au](mailto:B.O'Connor@curtin.edu.au)

**Cost:** \$2,420 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 *Diffraclus Topas*. While the course is relevant to the analysis of all classes of crystalline materials, attention will be devoted mainly to materials relevant to the mining and mineral processing sector.

Brian O'Connor  
Curtin University

### Internet XRF Course: Series 4, 2011

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 course include -

- Start at any time, subject to the availability of places in the course
- 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.

Course availability: Starting date by arrangement. Approximately 3 places available for Series 4 (2011) of the XRF I course.

Course director: Dr Brian O'Connor

Course fee: \$2,420 including GST

Further information and enrolment:  
[brian\\_oconnor@iprimus.com.au](mailto:brian_oconnor@iprimus.com.au)  
(Tel 08 9291 7067)

Brian O'Connor

## AXAA Website and contacts

<http://www.axaa.org>

### NATIONAL COUNCIL PRESIDENT

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**Please email contributions to the 2<sup>nd</sup> 2011 e-newsletter edition to Nathan Webster by Monday 13<sup>th</sup> June.  
Any comments and feedback about the newsletter are welcome.**

## Events, Conferences, Deadlines

Date	Event	Location	Further Information
Start at any time, subject to place availability	XRF I-Course	Internet delivery	<a href="mailto:brian_oconnor@iprimus.com.au">brian_oconnor@iprimus.com.au</a>
10-13 Sept, 2011	National XRD Course	Curtin University of Technology, Perth	<a href="mailto:B.O'Connor@curtin.edu.au">B.O'Connor@curtin.edu.au</a>
2-12 June 2011	The International School of Crystallography, 44th Course "The Power of Powder Diffraction"	Ettore Majorana Centre, Erice, Sicily, Italy	<a href="http://www.crystallrice.org/erice/2011/2011pd.htm">http://www.crystallrice.org/erice/2011/2011pd.htm</a>
22 - 30 August 2011	XXII General Assembly and Congress of the International Union of Crystallography	Madrid, Spain	<a href="http://www.iucr2011madrid.es">www.iucr2011madrid.es</a>
23 June 2011	Australian Synchrotron Round 2011/3 Call for Proposals Closes	-	<a href="http://www.synchrotron.org.au">http://www.synchrotron.org.au</a>

## Advertising

### **Bruker Launches the S8 DRAGON™ - a Compact, Next-Generation, Truly Simultaneous XRF Spectrometer for the Metals Industry**

**Innovative Design Allows S8 DRAGON to Cover Almost the Complete Periodic Table with Higher Performance, Smaller Footprint and Lower Life-Cycle Costs**



**Bruker AXS**

ATLANTA, Georgia – March 14th, 2011 – At Pittcon 2011, Bruker launches the novel **S8 DRAGON™**, the first truly simultaneous X-ray fluorescence (XRF) spectrometer for precise, high-speed elemental analysis for process control in metal production and foundries. The **S8 DRAGON** offers high quantitative precision in combination with elemental flexibility for up-to-date production control, covering almost all elements of the periodic table in a single, rapid measurement.

The key to this innovation is the unique design of the **S8 DRAGON**, combining proven single element channels with the new **Multielement Channel™**. With 4 kW high excitation power and dedicated element channels, the **S8 DRAGON** delivers unmatched precision for essential elements in metal production, while its innovative **Multielement Channel** simultaneously analyzes the additional elemental fingerprint, all in one run in less than 40 seconds. This advantage compared to conventional simultaneous XRF spectrometers brings essential benefits for process control in steel and non-ferrous metal production. With its unique parallel data acquisition in dual mode, the **S8 DRAGON** offers enhanced data safety for better cost efficiency due to improved process control.

The **S8 DRAGON** utilizes Bruker's **TouchControl™** for ease of use and reliability. **TouchControl** enables multilingual (English, Chinese, Portuguese, Russian, Spanish, etc.), simple and essentially fail-safe operation via an integrated touch screen, thus requiring minimal user training.

The footprint of the **S8 DRAGON** is more than 25% smaller compared to traditional, bulky simultaneous XRF spectrometers. It easily fits into most laboratories for daily routine work. With its automation interface, the **S8 DRAGON** seamlessly integrates into various types of laboratory automation, including automated sample preparation and LIMS.

--- more ---

“The **S8 DRAGON** meets and exceeds the expectations of the metals industry for ultimate precision and reliability. In less than 40 seconds, process engineers are fully informed about the elemental composition and quality of their materials,” stated Dr. Kai Behrens, XRF Product Manager of Bruker AXS. “The **S8 DRAGON** is a novel, truly simultaneous XRF spectrometer that completes Bruker’s comprehensive product portfolio for elemental analysis in metal production and foundries, ranging from handheld XRF instruments for positive material identification, to the **S8 TIGER** sequential WDXRF for central laboratories all the way to optical emission spectrometers (OES) for process control in all production stages.”

**About Bruker Corporation**

Bruker Corporation (NASDAQ: BRKR) is a leading provider of high-performance scientific instruments and solutions for molecular and materials research, as well as for industrial and applied analysis. For more information, please email [baxs@bruker-axs.com.au](mailto:baxs@bruker-axs.com.au)

For more information **S8 DRAGON**, please visit [www.bruker.com/dragon](http://www.bruker.com/dragon)



*S8 DRAGON™ - the first truly simultaneous X-ray fluorescence (XRF) spectrometer covering almost all elements of the periodic table in one run*

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## PANalytical raised performance bar with launch of new Epsilon 3 benchtop spectrometers

PANalytical launches Epsilon 3, a new range of benchtop energy dispersive X-ray fluorescence (EDXRF) spectrometers that challenges convention and outperforms expectations. Making its first public appearance in AXAA 2011, the Epsilon 3 was an instant hit with customers. In less than four weeks, five Epsilon 3 systems have been sold in Australia alone!

**Challenging convention - outperforming expectations**

Powered by a new high performance ceramic tube and the latest advancements in silicon drift detector technology, the Epsilon 3 and Epsilon 3 XL versions deliver accurate, precise and very reliable analysis from fluorine (F) to uranium (U) - right across the periodic table. The Epsilon 3 range matches, and in some cases surpasses, the analytical performance of larger, more powerful spectrometers.

**Wide-ranging applications**

Enhanced by a variety of software modules, such as, Omnia standardless analysis, rapid identification fingerprinting or regulatory compliance, Epsilon 3 is a versatile and easy-to-operate analytical tool suitable for a wide range of applications. It is ideal for quality control, pre-screening or as backup in many industries like mining and minerals, petrochemical, cement, glass, iron and steel, food, cosmetic, pharmaceuticals and more. Its small footprint makes it an ideal choice for field screening for geology purposes.

**Ready for any sample**

Epsilon 3 can handle a large variety of samples: including solids, pressed and loose powders, liquids and filters, weighing from a few grams to larger bulk samples. Operators can measure unprepared samples, large or irregular shaped objects in complete safety as Epsilon 3 has no opened source high-energy X-rays.

**Global support and Expertise**

PANalytical customers can access support and expertise through the unique PANassist programme, as well as from a worldwide service network. Find out more by contacting your local PANalytical representative, or at: <http://www.panalytical.com/epsilon3>



# Diffraction Technology

Instruments and accessories for X-ray analysis

AXO of Dresden, manufacturers of fine precision X-ray optics and Multilayers, introduce a new concept in standards - the

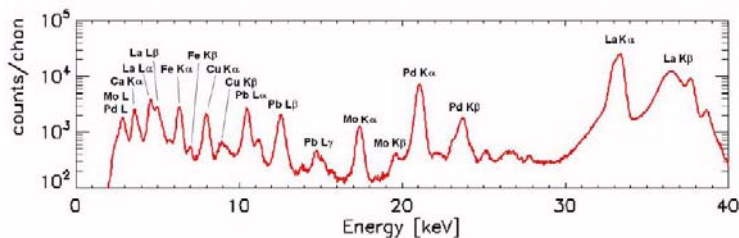
## Thin Film XRF Reference Standard.

These have type Nos. RF4-100-S1749 and RF4-200-S1749 and were introduced at AXAA 2011. They consist of deposits of 7 elements in the ng/mm<sup>2</sup> range, to provide a wide elemental range with minimum overlaps and all of similar intensity. The elements are Pb, La, Pd, Mo, Cu, Fe, Ca, deposited on a Si Nitride substrate so Si is also present from the substrate.

The standards are deposited on a SiN membrane 100nm or 200nm thick and each has only 1 – 3 atomic layers so they are "infinitely thin".

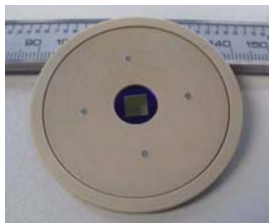
Deposited area is 5 x 5 mm and the Si frame is 10 x 10 mm

### Thin Film XRF Reference Samples RF4-100-S1749 and RF4-200-S1749

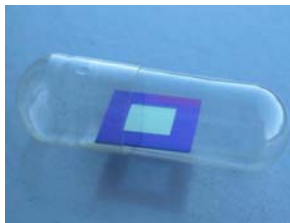


Energy spectrum of the 7-element reference sample RF4-200-S1749 measured at 40 keV excitation. The energy range from -2 keV to 40 keV is covered with peaks of comparable intensity.

On PEEK holder



Bare membrane



For more information and to obtain price and delivery Contact Rod Clapp (03 9787 3801)

[diffraction@bigpond.com](mailto:diffraction@bigpond.com)

Diffraction Technology  
[www.diffraction.com.au](http://www.diffraction.com.au)