AXAA e-newsletter
Australian X-Ray Analytical Association

Issue 2010/03 September 2010

Enquiries: Dr Catherine Kealley, catherine.kealley@uts.edu.au

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1. Message from the National President

Dear AXAA Community,

In the lead up to AXAA-2011 we are pleased to announce free membership to AXAA. Simply fill out the form at our website (see below) and your application will be processed at the next AXAA National Council meeting, enabling you to access the reduced AXAA-2011 member registration fee.

In accordance with the requirements of the AXAA-Inc constitution, the current National Council will vacate their positions at the next AGM, to be held during AXAA-2011. We seek nominations for 3 National Council positions, which can include the President, Treasurer, Secretary, General Council Members, with an optional Vice-Presidential Position. Nominations must be received by the 18th January 2011. Please forward your nominations to the Secretary (nbx@ansto.gov.au) and read on for further details.

The NSW student seminar day this year was combined with the techo arvo event and an XRD in the workplace course. The standard for the NSW student seminar day was the highest yet, with judges facing an extremely tough decision to separate many of the presentations based on their quality. Nonetheless, two bursaries to attend AXAA-2011 were awarded. We are looking forward to an equally superb Victorian Student Seminar Day on the 6th October, where further student bursaries to attend AXAA-2011 will be awarded, including travel and accommodation arrangements.

Finally, the abstract submissions for AXAA-2011 have closed. To attend AXAA-2011, please register by 11th November to obtain the early-bird rate. Late submissions may request a poster presentation by contacting the Conference Chair (me, vanessa.peterson@ansto.gov.au).

Kind Regards,
Vanessa

Vanessa Peterson
AXAA President
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2. Editorial

5 months and counting: AXAA 2011 !!!!!!!!!!!!!!!!!!!!!!!!!!!!!! ☺

We hope you enjoy our September newsletter – keep your eye out for the chance to win a prize!!! The **closing date for Issue 2010/04 is November 26th 2010.** I am happy to send an email reminder a fortnight before this deadline to anyone who wishes to be on the reminder list (let me know if you have not already done so: catherine.kealley@uts.edu.au). As editor, I would greatly appreciate short reports on general topics and techniques, short articles or technical notes (1-2 pages of text, or less), news items from vendors, Technical Program Committee reports on activities held, upcoming events information, meeting and conference dates, and so on. Any photographs/graphs/diagrams are especially welcomed (a picture is worth 1000 words!). Feel free to contact me with any submissions, questions or suggestions you have: catherine.kealley@uts.edu.au.

Catherine Kealley
AXAA Vice-President/Newsletter Editor
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3. AXAA Membership Renewal 2010-2011

If you have not filled in a membership form recently (ie. in the last month), then the chances are that your membership has expired! Firstly, a 12 month membership (2010 – 2011) with the Australian X-ray Analytical Association Incorporated is **free**. More importantly, if you become a member of by **Friday 8th October 2010**, you will be able to take advantage of the "AXAA Member" rates when registering for AXAA 2011 Workshops, Conference and Exhibition.

To Become a Member:

http://www.axaa.org

Go to "Become a Member", download the form and return (by email, fax or to the postal address at the top of the form). Note: MEMBERSHIP IS FREE – please ignore any payment section.

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4. Call for AXAA National Council Nominations

The AXAA National Council announces a call for Nominations to form the 2011 – 2014 National Council. The new Council will comprise 6 members, with 3 being nominated by the retiring Council and 3 being elected by the membership. The Council has announced the three Council-appointed members –

Vanessa Peterson (The Bragg Institute ANSTO, NSW)
Gordon Thorogood (Institute for Materials Engineering, ANSTO, NSW)
Natasha Wright (CSIRO Materials Science and Engineering, Victoria)

We call for nominees for the 3 elected positions.

Closing Date for Submission of Nominations: 15th November 2010

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5. Best "Tongue-in-Cheek" Article

Calling all "Scattering Comedians" !!!!

For those of you privileged enough to have read the article "XRF Employment Opportunity – Orange NSW", written by Ken Turner and Ambrose (stud Boer Billy Goat in photo), in our December 2009 edition (if you missed out, it is Archived at http://www.axaa.org), you will know it was the highlight of last year's 'silly season'. Given the massive amount of feedback we received on this article, we would like to announce the inaugural AXAA Best "Tongue-in-Cheek" Article Competition. All articles should be emailed to Newsletter Editor Catherine Kealley (catherine.kealley@uts.edu.au) by 16th November 2010. Finalists will have their articles included in our December 2011 edition. So put your creative thinking caps on – anything scattering-related goes!!!!

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6. AXAA 2011 – Conference Announcements

PLATINUM SPONSORS

BRUKER

PANalytical

The Australian X-ray Analytical Association cordially invites you to attend the 2011 Workshops, Conference, and Exhibition (AXAA 2011) to be held 6 to 11 February, 2011, in Sydney, Australia, at Star City.

The meeting will showcase recent scientific results and exciting new developments in related instrumentation, software, and techniques of analysis. The focus will be on advances in both industrial and fundamental research, particularly those achieved though new developments in techniques. We welcome attendees from across academia and industry, with a special invitation (including financial support) to students.

The conference will consist of two days for workshops designed for novice users of scattering techniques of analysis, three days of conference presentations and plenary lectures, and an optional tour of the new OPAL neutron scattering facility on the final day.

VANESSA PETERSON, Conference Chair & AXAA President

Who should attend?

Academics, industrial lab professional staff, engineers, researchers, educators and leading professionals in other fields of X-ray technology will all benefit from attending. Also, newcomers to the field (senior undergraduate and postgraduate students, and those working in an X-ray analysis laboratory for the first time) will gain much from both the Schools and Conference sections of AXAA 2011.

Further information

Website **www.axaaconference.info**
Email **axaa@pco.com.au**
Phone **(02) 4984 2554**

TOPICS

We are offering XRD and XRF basics and advanced workshops with lectures on the following topics:

- Fluorescence in the workplace
- Standards and quality assurance
- Quantitative phase analysis
- Industrial applications of neutrons
- Complementary analytical methods (Both diffraction and spectroscopy)
- Stress/Strain

We invite you to submit Conference abstracts for presentations on:

- Studies using the following techniques and methods:
- In-situ diffraction
- Diffraction analysis including the Rietveld method
- Remote access instrument operation
- Micro XRD, CT, and XRF
- High-throughput techniques
- Online analysis
- Small angle scattering
- Single crystal studies
- Emerging capabilities in fluorescence
- Surface analysis

Materials and research areas:

- New materials
- Cultural heritage
- Environmental applications of XRF
- Biomineralisation
- Criminal Forensics, including border security and diffraction techniques
- Nanotechnology
- Materials for energy systems
- Mineralogy
- Iron Ore
- Alumina
- Uranium
- Metals
- Coal
- Cement and concrete

Vanessa Peterson
AXAA President

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Call for Poster Abstracts

Although the "Call for Abstracts" has officially closed, we are **still accepting abstracts for posters** (and Student Bursaries – see below: "8. AXAA 2011 Student Bursaries"). Please complete abstract submission at: www.axaaconference.info

Accommodation for AXAA 2011

We have negotiated some excellent rates at the Star City Hotel (Conference Venue) and the IBIS Darling Harbour, Sydney. Many of the rooms have already been taken, so please don't leave it to the last minute to book your room!!! Your accommodation needs to be booked on the registration form at www.axaaconference.info and NOT directly with the hotels to secure the conference rates.

7. AXAA Awards for Excellence in X-Ray Analysis: Call For Nominations

Closing Date for Submission of Nominations: 22 October 2010

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 XRD 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

Closing Date for Submission of Nominations: 22 October 2010

Selection Process

1. The National Council has appointed 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.

Vanessa Peterson

AXAA President

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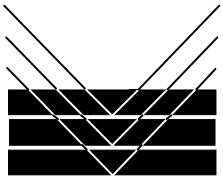
8. AXAA 2011 Student Bursaries



AUSTRALIAN X-RAY ANALYTICAL ASSOCIATION INCORPORATED

AXAA-2011 Conference Bursaries

Students and Young Practitioners of Scattering Techniques of Analysis

The Australian X-ray Analytical Association (AXAA) is pleased to offer a limited number of bursaries to assist students and young practitioners of scattering techniques of analysis to attend the AXAA National Schools and Conference (AXAA- 2011), which will be held from the 6th to 11th February, 2011 in Sydney, NSW.

Bursaries will cover the full cost of conference registration and, if applicable, a significant contribution towards travel and accommodation. Applicants should be members of the AXAA and be prepared to present a paper (oral or poster) at AXAA-2011.

Applications should be sent to Robert Hart (r.d.hart@curtin.edu.au) and include:

- a short written submission by the applicant outlining their background and current work applying scattering techniques of analysis
- an extended abstract of their proposed AXAA-2011 paper
- a supporting letter from their supervisor or manager.
- For non-members, a completed membership application, available from the AXAA website www.axaa.org should also be included.

Applications close on 15th of October, 2010.

Applicants will be notified of their success by the end of October and will be required to indicate their acceptance of the Bursary and attendance at the conference by the early bird registration deadline of **26th of November, 2010**
Funds will be available before the conference, as soon as the student accepts the Bursary. Further details of AXAA-2011, including requirements for extended abstracts may be found on the conference website www.pco.com.au/axaa2011

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9. "Scattering Matters" Report

The NSW Student Seminar Day was held at the UNSW Analytical Centre on Wednesday 7th July 2010, 5-7pm followed by drinks and pizza. The event had a healthy participation by the XRD in the workplace workshop attendees, students, academics, industry representatives, and AXAA members. Quality of presentations was exceptional with judges having an extremely difficult time ranking the presenters. Winner, Jessica Chadbourne from the Molecular Framework Materials group, School of Chemistry at the University of Sydney presented "Cyanide-Bridged Coordination Frameworks on a Date with Diffraction". Very close second: Andrew Princep from the School of Physical Environmental and Mathematical Sciences, the University of New South Wales at ADFA, presented "Resonant X-ray scattering – the best kind of X-ray scattering". An amusing situation arose during Andrew's presentation where some of the fonts used were unsupported by the equipment we had, resulting in Andrew having to explain unguided the Bragg law as applied to resonant X-ray scattering. After a short bout of expletive, Andrew proceeded to do this extremely well. So, as a general rule – embed your fonts in you presentations!

Talks were given!

Congratulations to Jessica Chadbourne

Congratulations to Andrew Princep

And then it was time for networking!!!

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10. Upcoming Events

Wednesday 6th October, 2010
2:00 - 5:00 pm
CSIRO Materials Science and Engineering
Bayview Ave, Clayton

AXAA

"Something to Bragg About"

AXAA Victoria Student Seminar Day 2010

Information:

- For undergraduate (including Honours) and postgraduate (Masters and PhD) students, with results from any X-ray or neutron diffraction or scattering technique(s) that have been applied to their research (any discipline).
- Student presentations 12 minutes in length, with 3 minutes for questions.
- 2 × Plenary seminars (15 mins) presented by career scientists.
- Presenters will be selected on the merit of their applications.
- The **best presentations** in undergraduate and postgraduate categories will be awarded a student bursary prize, covering **airfare, accomodation and registration** costs for the AXAA 2011 conference in Sydney (http://www.pco.com.au/axaa2011/).
- All are welcome to attend – students, supervisors, colleagues….
- Refreshments will be provided after the seminars.
- Send applications by email to natasha.wright@csiro.au by 5 pm Wednesday 8th September 2010. Selected applicants notified by Wednesday 22nd September.
- Applications must include you *name and contact details*, an *abstract* (maximum 400 words) and a *brief paragraph* highlighting the diffraction/scattering technique(s) used and relevance to your field of study.
- For more information contact Natasha Wright (natasha.wright@csiro.au) or Nathan Webster (nathan.webster@csiro.au).

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National XRD Course *X-ray Powder Diffraction Analytical Methods*, Curtin University, Perth

Dates for 2011 course to be advised

Venue: Department of Imaging and Applied Physics, Curtin University of Technology, 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 for 2011 courses to be advised

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

Enquiries and further information: 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 *Diffracplus 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 of Technology
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Internet XRF Course: Series 3, 2010-11

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.

Course availability: Starting date by arrangement. Limited number of places available for Series 3 (2010-11) of the internet course.
Course director: Dr Brian O'Connor
Course fee: $2,420 including GST
Further information and enrolment: brian_oconnor@iprimus.com.au (Tel 08 9291 7067)

Brian O'Connor
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11. Calendar of Events

Date	Event	Location	Further Information
Start at any time	XRF I-Course	Internet delivery	brian_oconnor@iprimus.com.au
2011 dates to be advised	National XRD Course	Curtin University of Technology, Perth	B.O'Connor@curtin.edu.au
15-20 August 2010	XRM-2010	Chicago, USA	http://xrm2010.aps.anl.gov/
11-14 October 2010	IXS2010	World Trade Center, Grenoble, France	http://www.esrf.fr/events/conferences/ixs2010
31 October – 3 November 201	10th Conference of the Asian Crystallographic Association	BEXCO, Busan, Korea	http://www.asca2010.org/
22 – 24 November 2010	Australian Synchrotron User Meeting	Rydges Carlton, Melbourne	www.usermeeting.synchrotron.org.au
5-9 December 2010	AIP 2010	Melbourne Convention and Exhibition Centre	http://www.aip2010.org.au/
6-11 February 2011	AXAA Conference	Star City, Darling Harbour, Sydney, Australia	vanessa.peterson@ansto.gov.au
22 – 30 August 2011	XXII General Assembly and Congress of the International Union of Crystallography	Madrid, Spain	www.iucr2011madrid.es

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12. AXAA Website and Contacts

WEBSITE http://www.axaa.org

NATIONAL COUNCIL PRESIDENT
Vanessa Peterson, Bragg Institute, ANSTO, PMB 1, Menai, NSW 2234
Telephone: (02) 9717 9401, e-mail: vanessa.peterson@ansto.gov.au

NATIONAL COUNCIL VICE-PRESIDENT
Catherine Kealley, Department of Imaging and Applied Physics, Curtin University of Technology, GPO Box U1987, Perth, WA 6845.
Telephone (08) 9266 3673, e-mail: catherine.kealley@uts.edu.au

NATIONAL COUNCIL SECRETARY
Ned Blagojevic, ANSTO, PMB 1, Menai NSW 2234
Telephone: (02) 9717 3660, e-mail: ned.blagojevic@ansto.gov.au

NATIONAL COUNCIL TREASURER
Rob Hart, Department of Imaging and Applied Physics, Curtin University of Technology, GPO Box U1987, Perth, WA 6845.
Telephone: (08) 9266 2643, e-mail: r.d.hart@exchange.curtin.edu.au

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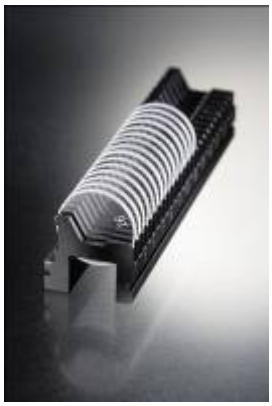
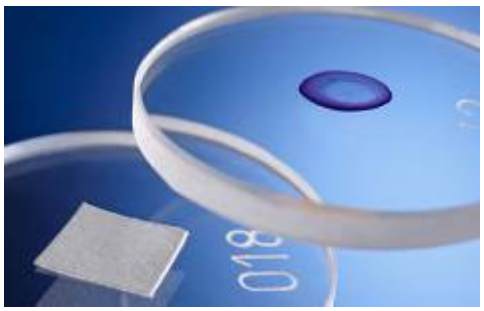
13. Company Advertising

Customer application studies show the versatility of the uses of the S2 PICOFOX in the fields of pharma authenticity, environmental testing, food, agricultural products, nutritional supplements, biochemical and medical applications. The successful applications range from R&D, such as Nano materials, blood, plasma and protein analysis to Forensics and Pharmaceutical product verification. Successful applications studies with clients from the mining sector enable the S2 PICOFOX to be used as well for geochemical screening, optimization of ore processing, and exploration.





Both manual and auto sampler models of our benchtop TXRF S2 PICOFOX can be equipped with different excitation sources (Mo and W) to optimise the analytical performance. Unlike traditional WDXRF or EDXRF, TXRF does not suffer from matrix effects requiring dedicated calibrations for each material. All S2 PICOFOX instruments are pre calibrated from the factory in Berlin, Germany and traceable to primary standards.

For more information on the S2 Picofox TXRF contact:
Bruker Biosciences Pty Ltd
1/28A Albert St, Preston VIC 3072
Ph: 03 9474 7000 , Fax: 03 9474 7070
neil.hughes@bruker.net.au

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Bruker EBSD News

Bruker takes pride to provide the most easy-to-use EBSD system in the market with QUANTAX CrystAlign. We want to give non-expert users the same chance to obtain meaningful measurement results as EBSD experts. Therefore the EBSD software runs under the same GUI as the EDS software, so all required tools are immediately at hand instead of having to search for the right program for the required task. Also, a set of assistants allows automatic pre-measurement setup of the system.

We have completed some exciting EBSD developments. These include addition of fore-scattered/back-scattered electron detectors (FSE/BSE) for the *e*⁻***Flash***^{1000} detector. This is the first detection system to actually provide real time colored orientation images in a SEM! Also, we have a new dynamic pattern simulation software package, which produces simulated EBSD patterns with a previously unheard of accuracy.

What is the *e*⁻***Flash***^{1000} detector?

All new EBSD detectors are called *e*⁻***Flash***^{1000} now. The detector module is the same as for the previous model. The differences are contained inside:

- the detector now collects up to 800 patterns/s (8 x 8 binning)
- it can be ordered with the FSE/BSE detectors and the electronics are contained in the detector module (model *e*⁻***Flash***$^{1000+}$)

All other parameters are identical to the previous model.

The new FSE/BSE detectors – Color in the SEM

The set of two BSE detectors is mounted above the screen of the EBSD detector. The three FSE detectors are below the screen. The screen of the *e*⁻***Flash***^{1000} remains user replaceable.

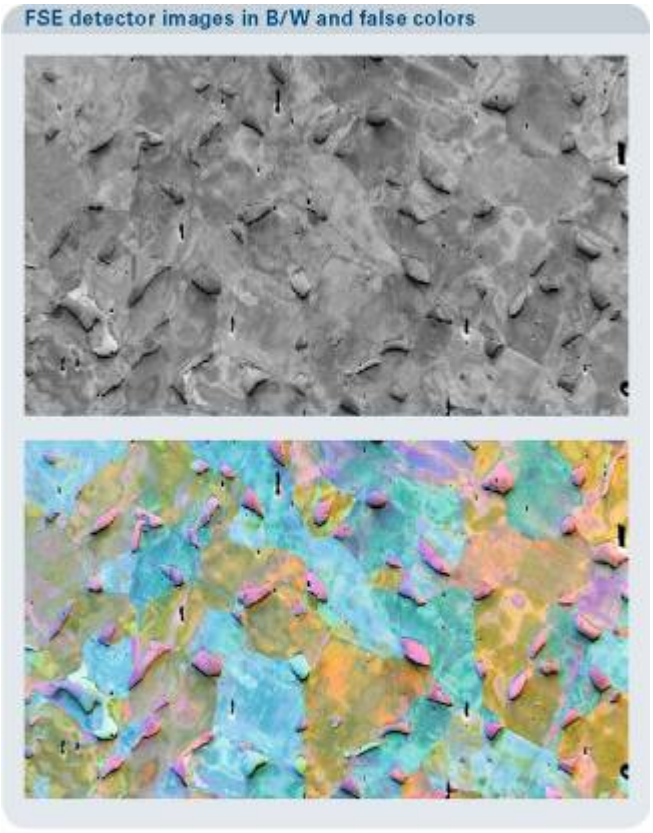
All electronics required for the operation of the FSE/BSE detectors are included in the *e*⁻***Flash***$^{1000+}$ detector module. Apart from the convenience, this also ensures that signal loss is minimized as the preamplifiers are close to the detectors. Automatic signal optimization is offered for every detector. If desired, the signal of the specific detectors can be adjusted manually.

The FSE/BSE detectors are user replaceable as well. This is not only advantageous in the case of repairs, but a very useful feature for avoiding damage under extreme environmental conditions, e.g. in-situ heat treatment experiments.

If the EBSD detector is fully inserted, the standard SEM SE and BSE detection systems tend to produce noisy images of low quality. Bruker's BSE detectors are positioned optimally to acquire the BSE signal from samples with a high tilt angle, as required for EBSD measurements.

Each of the three FSE detectors below the EBSD screen captures a part of the diffraction signal. As this is anisotropic and dependent on crystallite orientation, it is improbable that all three of the FSE detectors will register the same signal brightness for adjacent grains. Color coding and mixing the individual detector signals produces colorful images of the grain structure. This feature is unique to Bruker's FSE detectors. The user even has the choice to define palettes for optimum sample representation. These images prove very helpful for subsequent EBSD analysis. The clarity of the

image indicates the quality of sample preparation. Moreover, these images can be used to judge the microstructure of the sample prior to the actual EBSD analysis.



Upper image: Greyscale FSE image of a polished section of the Cape York iron meteorite, similar to what can be obtained with common FSE detectors.

Lower image: Color coded image produced by mixing the signals of the Bruker FSE detectors, showing microstructural details invisible in the greyscale image.

Unique to Bruker Nano: Dynamic pattern simulation software for QUANTAX CrystAlign now available

As band positions are characteristic not only for crystal orientations but also phases themselves, it is important to correctly predict the most intense bands. This is an important support for correct phase identification via EBSD. While the usual prediction using kinematic theory works reasonably well for simple structures, the situation changes dramatically when looking at more complicated structures. Here kinematic theory fails in many cases, providing erroneous intensities.

The solution is to use dynamic theory simulation. This has become a viable option as computer performance has greatly increased, supporting complex calculations in a shorter time. We have released pattern simulation software based on dynamic theory for the CrystAlign EBSD system. This software provides the desired reliable intensity predictions for complex phases and much more.

Bruker's dynamic pattern simulation software offers:

- Valuable tools for fundamental understanding of EBSD pattern formation regarding
  - information depth
  - energy distribution, and many more
- Extraction of real band intensities
  - indexing of crystallographically more complex phases
  - determination of pseudo-symmetries
- Generation of reference patterns for
  - phase verification and identification
  - point group determination (e.g. polar direction)
  - lattice strain approximation.

For more information on Bruker EBSD contact:
Bruker Biosciences Pty Ltd
1/28A Albert St, Preston VIC 3072
Ph: 03 9474 7000 , Fax: 03 9474 7070
jens.bergmann@bruker.net.au

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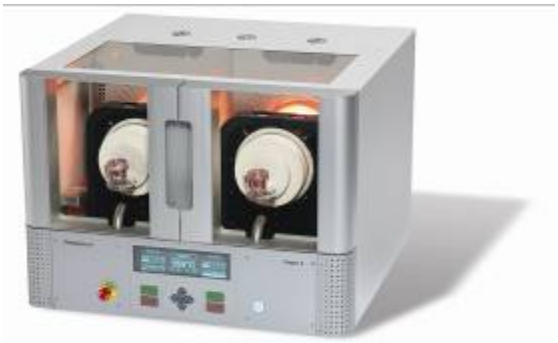
PANalytical in partnership with XRF Scientific on XRF fusion technology

In line with the company's policy to support its customers with total solutions, PANalytical (Almelo, the Netherlands) has formed a strategic alliance with XRF Scientific (Perth, Australia) in the field of XRF fusion technology. The first result of this cooperation is the launch of a new fused bead preparation system, the Eagon 2.



Eagon 2 – perfect fused beads, every time.

This new partnership supports the PANalytical EXPERTISE programs, which are designed to ensure that the capability and potential of each user's analytical X-ray systems is fully realized. EXPERTISE programs provide priority access to the company's unrivalled application knowledge and experience in X-ray methodologies.

Pieter de Groot, Director - New Business Development, PANalytical, enthused, "PANalytical has long recognized the importance of sample preparation for XRF analysis. We can now leverage the fusion technology of XRF Scientific with our XRF expertise and bring it to our users. Of course, the new combination is supported by PANalytical's extensive worldwide customer support and application network."

Steve Prossor, XRF Scientific, added "Being based in Australia, where fusion is a very dominant sample preparation technology in the mining industry, our customers understand the importance of fused bead sample preparation for accurate and precise XRF analysis. This demanding customer environment has forged the quality of our systems and drives continuous innovation."

It is clear that with XRF Scientific, we could bring the safest, most versatile, practical and robust automated fusion machine to the market - the Eagon 2, a high performance, cost-effective solution.

Visit: http://www.panalytical.com/eagon2 or contact your local PANalytical representative to find out all about making fused beads without compromise.

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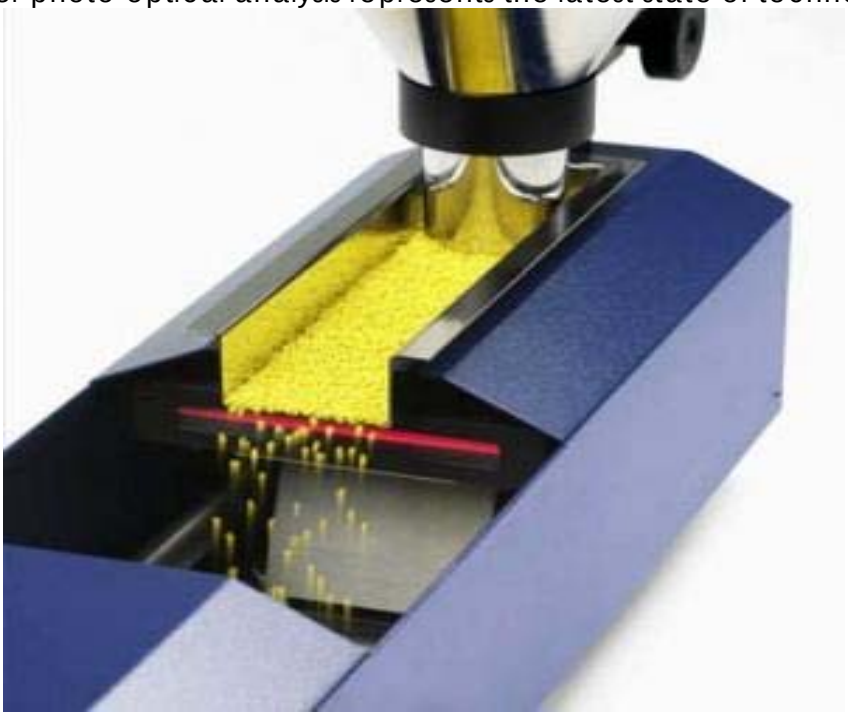
Haver & Boecker Photo- Optical Particle Analysis

In the field of conventional particle size analysis, Haver & Boecker has been the market leading manufacturer of test sieve shaker for many years. In the early 90s, this head start in terms of expertise provided the ideal conditions for taking new steps as a pioneer in particle analysis with the integration of powerful computer technology. Then as now, Haver & Boecker photo-optical analysis represents the latest state of technology.



The patented HAVER CPA measuring process is used to analyse grain sizes and grain shapes of dry non-agglomerating particles in bulk materials in the measuring range from 10 µm to 400 mm. When fitted with the appropriate HAVER peripherals, this process can be used as a laboratory, technical centre or on-line version in many different fields.

The results produced by the HAVER CPA are absolutely comparable with a conventional sieve analysis but offer a range of decisive advantages.

- Up to 10,000 detected, measured and analysed per second
- High reproducibility of measuring results.
- Enormous time saving.
- Additional information relating to grain shapes and particle numbers.
- Low maintenance technology.
- Diversity of particle data analysis.
- Up to 28,000 line scans per second.
- High data recording frequency.
- Can be automated for unattended operation.
- CPA software is Windows® XP, Vista, 7 compatible.

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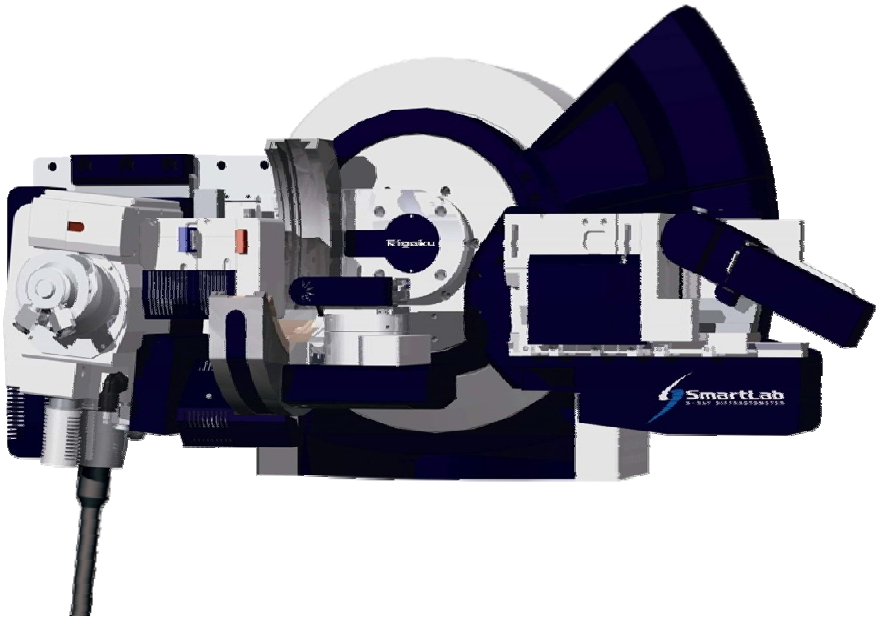
Rigaku SmartLab®: Advanced high resolution measurements with simple operation



The SmartLab high-resolution diffraction system represents the state of the art in fully automated modular XRD systems. The system incorporates a high resolution theta/theta closed loop goniometer drive system, CBO, an in-plane scattering arm, an optional 9.0 kW rotating anode generator, and a fully automated optical system to make advanced measurements possible for both expert and novice users of the system.

Winner of the 2006 R&D 100 Award for technical innovation, the SmartLab is designed for completely automated analysis of thin films and other advanced materials. Powered by Guidance, Rigaku's revolutionary knowledge based software package, SmartLab uses fully developed measurement packages for completely automated measurement of thin films, nanomaterials, powders, and liquids. Measurement packages exist for powder diffraction, glancing incidence diffraction, in-plane diffraction, X-ray reflectivity and small angle X-ray scattering (SAXS) measurements.

Features

- θ/θ design for horizontal sample mounting
- Closed loop drive system for high resolution scanning
- Optional 9.0 kW rotating anode generator
- Fully automatic system alignment
- Guidance software based automated measurement
- 300 mm wafer handling
- CBO for focusing and parallel beam geometries without reconfiguration
- In-plane diffraction arm for in-plane measurements without reconfiguration
- High resolution optics
- SAXS capabilities
- Optional Pilatus Solid State 2D Detector

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