

DENVER X-RAY CONFERENCE®



60th Annual Conference on
Applications of X-ray Analysis

DENVER X-RAY CONFERENCE PROGRAM

1-5 August 2011 Colorado Springs, Colorado, U.S.A.

FEATURING A SPECIALIZED
SESSION ON CORE SHELL
SPECTROSCOPY

Plenary session:
“Foods & Drugs”

Training & Applications
Techniques & Instrumentation
Exhibits, Workshops, Sessions
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Mary Ann Zaitz, *IBM, Hopewell Junction, NY, zaitz@us.ibm.com*

Future DXC Dates:

6–10 August 2012

Denver Marriott Tech Center Hotel, Denver, CO

5–9 August 2013

The Westin Westminster, Westminster, CO

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GENERAL INFORMATION

ACCOMMODATIONS

The 2011 Denver X-ray Conference will be held at the:

Crowne Plaza Hotel
2886 South Circle Drive
Colorado Springs, CO 80906, U.S.A.

Phone: 1.719.576.5900 or 1.800.981.4012

Fax: 1.719.576.7695 / Web site: www.cpcoloradosprings.com

The hotel will offer complimentary transportation to and from downtown Colorado Springs for conference attendees and their families.

HOTEL RESERVATIONS

(Rates applicable until 6 July 2011, subject to availability). Attendees are responsible for making their own reservations.

Please call 1.800.981.4012 and identify yourself as a Denver X-ray Conference attendee when booking your reservation or visit www.dxcicdd.com for online reservations.

The special conference rate of \$129.00 per night (plus tax) has been contracted for our group. Don't wait to book your reservation—there are a limited number of rooms available at the special conference rate! Rates applicable until 6 July 2011 (subject to availability). All reservations must be guaranteed and accompanied by a first night room deposit, or guaranteed with a major credit card.

GROUND TRANSPORTATION/SHUTTLE SERVICE

Colorado Springs Shuttle Company book online:
www.coloradoshuttle.com

Offering transportation from the Denver International Airport to the Crowne Plaza hotel in Colorado Springs.

POSTER BOARDS

The poster boards used during the evening poster sessions will be 4' high x 8' wide boards. Authors must bring their own thumbtacks or Velcro. Poster boards will be set in the Summit Ballroom on the 4th floor of the hotel. Posters must be set 15 minutes prior to the start of the session, and can be removed at the end of the session. ICDD is not responsible for any posters left by the author(s).

EMPLOYMENT CLEARINGHOUSE

We will have a separate bulletin board to announce employment opportunities. Prospective employers should bring announcements with them for posting.

BOOK OF ABSTRACTS

The DXC *Book of Abstracts* will be available at the Conference Registration Desk. To view the abstracts before the conference, visit our web site: www.dxcicdd.com. Abstracts are listed in alphabetical order by the contact author's last name, and are searchable.

REGISTRATION DETAILS

All on-site registrations will be conducted at the Conference Registration Desk, located on the ground floor (level one) of the Crowne Plaza Hotel, outside the Colorado Grand Ballroom (exhibit hall).

REGISTRATION TIMES:

SUNDAY, 31 JULY	4:00 pm – 7:00 pm
MONDAY, 1 AUGUST	8:00 am – 3:00 pm
TUESDAY, 2 AUGUST	8:00 am – 3:00 pm
WEDNESDAY, 3 AUGUST	8:00 am – 2:00 pm
THURSDAY, 4 AUGUST	8:00 am – 2:00 pm

PLEASE NOTE: Attendees (even those pre-registered) should check in at the Conference Registration Desk for conference materials (name tags, *Book of Abstracts*, late announcements, etc.).

CANCELLATION POLICY

Cancellations must be submitted in writing to the Conference Coordinator. A full refund will be issued, less a \$50 processing fee, if the cancellation is received at least two weeks before the conference (Monday, 18 July 2011). No refunds will be issued for cancellations received after 18 July 2011.

VISA APPLICATION NOTICE

Obtaining a Visa is the sole responsibility of the attendee. The Denver X-ray Conference is not permitted to mediate with either the U.S. Embassy abroad or with the State Department on behalf of any conference attendee. However, if you need an invitation letter to the conference to submit with your application, please e-mail your request to: flaherty@icdd.com. Please include your name, passport #, birth date, mailing address, e-mail address and the title(s) of any abstract(s) that you have submitted for the conference. A copy of the letter will be e-mailed and airmailed to you.

CONFERENCE PROCEEDINGS

Don't miss this opportunity to showcase your research in the DXC conference proceedings, *Advances in X-ray Analysis*, Volume 55, by submitting your presented paper. Work presented during either an oral session or poster session is eligible for submission. Select papers will also be published in the journal, *Powder Diffraction*. Instructions for preparation and submission of manuscripts will be e-mailed to authors and posted online at: www.dxcicdd.com/advances/authors.htm. The deadline for submission is 1 September 2011.

Note: To be acceptable for publication, papers should describe either new methods, theory and applications, improvements in methods or instrumentation, or other advances in the state of the art. Papers emphasizing commercial aspects are discouraged.

Advances in X-ray Analysis is distributed throughout the world, and the complete manuscripts of volumes 40–51 (1996–2007) can also be viewed on the ICDD web site: www.dxcicdd.com/advances/advances.htm.

SPONSORSHIP OPPORTUNITIES

There are various sponsorships available to exhibitors of the Denver X-ray Conference. Please visit our website: www.dxcicdd.com for details or contact Denise Flaherty: flaherty@icdd.com, 610.325.9814.

STUDENT INFORMATION

DISCOUNT ROOMS

There are a limited number of hotel rooms being offered to students at a discounted rate of \$75 per night plus tax. Student rooms are shared—each room will be equipped with two double beds to accommodate two persons. Please visit the Denver X-ray Conference web site: www.dxcicdd.com for a Student Room Authorization form. Student identification will be required. Rooms will be booked on a first-come, first-served basis.

GRANTS

In pursuing its dynamic commitment to the education of the scientific community, the International Centre for Diffraction Data is offering limited travel support to help students attend the 2011 Denver X-ray Conference. Grants are awarded in the amount of \$500 for students living within the USA, and \$1,000 for students living outside of the USA. The Denver X-ray Conference also offers a reduced student registration fee and student housing. (See www.dxcicdd.com for full details). Students are required to participate in the technical program by submitting an abstract for oral or poster presentation. To apply for assistance, download a copy of the Student Grant Application form, and submit it with a copy of your abstract and a supporting letter from your research advisor. The deadline for applications is **1 June 2011**.

JEROME B. COHEN STUDENT AWARD

DEADLINE DATE FOR SUBMISSION 1 JULY 2011

This award was instituted in the name of Professor Jerome B. Cohen, one of the leaders in the field of X-ray analysis, and in the training of students in this art. The award is intended to recognize the outstanding achievements of student research in this field. All students, graduate or undergraduate, who are working in the field of X-ray analysis, can submit a technical paper describing their work. The winner will be selected by a committee of researchers in the field, and notified one week before the conference. The award for the year 2011 will be in the amount of \$1,000.

The following criteria applies:

- The research must be original, of high quality, and must be primarily the work of the student.
- Papers submitted to the Cohen Award must be presented at the conference in either an oral or a poster session. Thus, all first-author students must submit an abstract and also attend the conference.
- The winner must be able to attend the Plenary session of the conference on Wednesday morning for the announcement of the award.
- Papers must be submitted along with a certification form. The certification form may be found online: www.dxcicdd.com.
- Please follow the same format guidelines as manuscripts submitted for the conference proceedings, *Advances in X-ray Analysis*. This information can also be found online: www.dxcicdd.com/advances/authors.htm. Students competing for the award are not required to submit their manuscript to *Advances in X-ray Analysis*. If you would like your manuscript considered for publication in the conference proceedings, please note your request when submitting the manuscript, and include a signed Publishing Agreement, also available online.
- Papers must be submitted electronically, as an e-mail attachment, created as either a Word 2000–Word 2010 document or as a PDF (Portable Document File). Please e-mail the file to Denise Flaherty: flaherty@icdd.com. If you do not receive confirmation that the manuscript was received within one week of your submission, contact Denise by e-mail or phone: 610.325.9814.

Have a suggestion for
a workshop or session?

Let us know!

Visit www.dxcicdd.com to
submit your idea or speak with an
Organizing Committee Member!

EXHIBIT INFORMATION

Exhibits will be held in the Colorado Grand Ballroom, on the ground floor of the hotel.

2011 DENVER X-RAY CONFERENCE EXHIBITORS (as of April)

Amptek Inc.
AXO Dresden/Huber Diffraction
Blake Industries
Bruker
Chemplex Industries, Inc.
Corporation Scientifique Claisse, Inc.
e2V Scientific Instruments
Herzog Automation Corp.
HORIBA Scientific
Incoatec GmbH
International Centre for Diffraction Data
KETEK GmbH
Materials Data, Inc.
Micromatter (Advanced Applied Physics Solutions)
Moxtek, Inc.
PANalytical
PNDetector GmbH

EXHIBIT HOURS:

Monday	11:00 am – 5:00 pm
Tuesday	11:00 am – 5:00 pm
Wednesday	12:00 pm – 7:00 pm (60 th Anniversary Party in the Exhibit Hall)
Thursday	10:00 am – 1:00 pm

Premier Lab Supply
Proto Manufacturing, Inc.
Rigaku Americas Corp.
Rigaku Innovative Technologies, Inc.
SII NanoTechnology USA, Inc.
SPEX SamplePrep
Thermo Scientific Niton Handheld XRF Analyzers
Thermo Scientific-ARL XRF/XRD Spectrometers
Wiley
XGLab SRL
XIA
XOS

EVENING TECHNICAL SESSIONS & SOCIAL EVENTS

Spouses and families are welcome to attend all social functions. Wine & Cheese Receptions and Poster Sessions will be held in the Summit Ballroom on the 4th floor of the hotel, unless otherwise noted.

Monday, 1 August 5:00 – 7:00 pm
XRD Poster Session and Wine & Cheese Reception
Sponsored by PANalytical and ICDD

Tuesday, 2 August 5:00 – 7:00 pm
XRF Poster Session and Wine & Cheese Reception
Sponsored by Chemplex Industries, Inc.

Spouses' Coffee Hour

All spouses are invited to attend a complimentary coffee hour, sponsored by the Denver X-ray Conference. Coffee, tea and pastries will be served in the El Paso Room from 9:30 to 10:30 am on Monday and Tuesday. Information on local attractions and activities of interest will be provided.

Wednesday, 3 August 5:00 – 7:00 pm
60th Anniversary Party
Held in the Exhibit Hall (Colorado Grand Ballroom)
Sponsored by the International Centre for Diffraction Data

Thursday, 4 August
“Off-site” Event: An off-site activity will be planned for Thursday evening.
Please monitor the web site for details: www.dxcicdd.com

Special Thanks to our Evening Reception Sponsors, Coffee Break Sponsors and Media Sponsors:



WORKSHOPS / MONDAY & TUESDAY 1–2 AUGUST

am Workshops / 9:00 am – 12:00 noon

pm Workshops / 1:30 pm – 4:30 pm

MONDAY am **XRD**

Specimen Preparation XRD / Pikes Peak 1 & 2

Organizer & Instructors:

T.J. Fawcett, *International Centre for Diffraction Data, Newtown Square, PA, fawcett@icdd.com*

N. Bhuvanesh, *Texas A&M University, College Station, TX*

S. Quick, *The Pennsylvania State University, University Park, PA*

M.A. Rodriguez, *Sandia National Laboratories, Albuquerque, NM*

Specimen preparation is often the limiting step for obtaining good results in a diffraction experiment. Preparation methods can influence the accuracy and precision of peak positions, intensities and profile. These are the basic measurements required for qualitative and quantitative analysis. The presentation will focus on crystallite and particle effects, orientation and texture, particle statistics and how various preparation methods can reduce or eliminate these influences. We will also focus on “tricks of the trade” for the preparation of micro specimens, air and moisture sensitive specimens, and thin films. The presentation will cover a range of preparation techniques used with common instruments.

Two-Dimensional Detectors / Pikes Peak 3 & 4

Organizers & Instructors:

T.N. Blanton, *Eastman Kodak Company, Rochester, NY, thomas.blanton@kodak.com*

B.B. He, *Bruker AXS Inc., Madison, WI, bob.he@bruker-axs.com*

B. Toby, *Argonne National Laboratory, Argonne, IL*

S. Speakman, *Massachusetts Institute of Technology, Cambridge, MA*

Two-dimensional diffraction data contain abundant information about the atomic arrangement, microstructure, and defects of a solid or liquid material. In recent years, the use of two-dimensional detectors has dramatically increased in academic, government and industrial laboratories. This workshop covers recent progress in two-dimensional X-ray diffraction in terms of detector technology, data collection strategy, data evaluation algorithms and software, and instrument configurations. Various application examples, such as phase ID, texture, stress, crystallinity, combinational screening and thin film analysis will be discussed.

X-ray Metrology / Centennial

Organizers & Instructors:

J.P. Cline, *National Institute of Standards & Technology, Gaithersburg, MD, jcline@nist.gov*

D. Windover, *National Institute of Standards & Technology, Gaithersburg, MD, windover@nist.gov*

D.L. Gil, *Princeton University, Princeton, NJ, dgil@princeton.edu*

The workshop will explore the various methods for alignment, setup, qualification and use of laboratory diffraction equipment suitable for powder diffraction and thin film diffraction and reflectometry. A range of optical configurations will be discussed: conventional divergent beam, Johansson, graded parabolic mirrors, channel-cut symmetric and asymmetric monochromators and channel-cut analyzers. The methods for use of NIST SRMs to qualify and calibrate diffraction instruments will be covered using advanced methods of data analysis. These will include: for powder diffraction—the Rietveld method and the fundamental parameters approach; for high resolution and reflectometry—differential evolution and Monte-Carlo methods. Certification methods for SI-traceable NIST SRMs will also be discussed.

MONDAY am **XRF**

Basic XRF / Gold Camp

Organizer & Instructors:

T. Elam, *University of Washington APL, Seattle, WA, wtelam@apl.washington.edu*

G.J. Havrilla, *Los Alamos National Laboratory, Los Alamos, NM*

This workshop provides a basic introduction to the principles of XRF, and is specifically aimed at those new to the field. It will start with a general overview of the technique, followed by more specific details of the basic principles. The emphasis will be on understanding how to use XRF and what its capabilities are. In the second half of the workshop, a few selected applications will be presented. The focus of this segment will be to provide an understanding of how the basic principles affect actual practice.

WORKSHOPS

MONDAY pm **XRD & XRF**

X-ray Optics / Centennial

Organizer & Instructor:

G.J. Havrilla, *Los Alamos National Laboratory, Los Alamos, NM, havrilla@lanl.gov*

There are many X-ray optics available to spatially restrict X-rays for use in X-ray spectrometry. Each optic has its own characteristics, capabilities, advantages and disadvantages and unique application niches. This workshop will provide basic knowledge about X-ray optics, specifically multi layer optics, polycapillary optics, doubly curved crystal optics, and monocalipillary optics. One of the objectives in this workshop is to help users understand the basic working principles and performance characteristics of these optics. Attendees will learn the function of an X-ray optical system in selected applications and their capabilities.

MONDAY pm **XRD**

Rietveld Analysis / Pikes Peak 1 & 2

Organizers & Instructors:

S.T. Misture, *New York State College of Ceramics at Alfred University, misture@alfred.edu*

J.A. Kaduk, *Poly Crystallography Inc. and Illinois Institute of Technology, Naperville, IL, kaduk@polycrystallography.com*

This workshop will cover the theory (briefly) and applications of Rietveld analysis. A broad range of applications will be covered, including: crystal structure and unit cell refinement, quantitative analysis, size and microstrain determination, texture analysis, and handling partially amorphous specimens. The instructors will provide not only traditional lectures but also will show live demonstrations of refinements, and will be happy to field questions during the demonstrations.

Materials Characterization by Combining X-ray Analytical with 3D X-ray Imaging Techniques / Gold Camp

Organizer & Instructors:

I. Cernatescu, *PANalytical, Westborough, MA, iuliana.cernatescu@panalytical.com*

S.R. Stock, *Northwestern University, Chicago, IL*

G. Blaj, *CERN, Genève, Switzerland*

J. Gelb, *Xradia, Pleasanton, CA*

While X-Ray Diffraction (XRD) is sensitive to variation of structure, phases, orientation, and microstructure of crystallite materials, Computed Tomography (CT) is sensitive to electron density variation, independent of whether the material is crystalline or not. Each technique is a very powerful characterization tool on its own, however a more complete story can be given when the results from both techniques are combined. The aim of this workshop is to give the attendees an overview of X-Ray Diffraction (XRD) and X-Ray Computed Tomography (CT) and introduce the combination of both techniques for materials characterization. Both synchrotron- and laboratory-based techniques, instrumentation, and examples will be described.

MONDAY pm **XRF**

Trace Analysis / Pikes Peak 3 & 4

Organizers & Instructors:

C. Strelj, *TU Wien, Atominstitut, Wien, Austria, strelj@ati.ac.at*

P. Wobrauschek, *TU Wien, Atominstitut, Wien, Austria, wobi@ati.ac.at*

R. Van Grieken, *University of Antwerp, Antwerp, Belgium*

E. Margui, *University of Girona, Girona, Spain*

G. Pepponi, *Fondazione Bruno Kessler, Trento, Italy*

A. Martin, *Thermo Fisher Scientific, Sugar Land, TX*

This year's trace analysis workshop will provide an introduction of basic fundamentals interesting for both beginners and experienced X-ray spectroscopists. Main topics to be covered are presentations of most modern techniques and instrumentation for trace element analysis. Physical methods to improve minimum detection limits in XRF by background reduction; for example, as use of sources of polarized radiation (Bragg-Barkla polarizers and synchrotron radiation), selective excitation, monochromatization will be presented. Taking secondary targets in orthogonal geometry or simple filtering of the primary radiation as a means of improving detection limits is discussed. Introduction to total reflection XRF (TXRF) and actual instrumentation including portable TXRF is another point of interest and will show achievable advantages and results in terms of detection limits, sensitivities and detectable elemental range. Applications from interesting scientific fields as environment, microelectronics, forensic, and life science will show the successful use of the importance of the various XRF spectrometric techniques.

WORKSHOPS

TUESDAY am **XRD & XRF**

NEW! Technical Communication / Pikes Peak 1 & 2

Organizer & Instructor:

L. Rosenstein, *Georgia Institute of Technology, Atlanta, GA, lr3@ce.gatech.edu*

In this year's technical communication workshop, the focus will be on the oral reporting of technical information. Because poorly designed slides can undermine the quality of even the most talented speaker's presentation, I will first address the issue of standard practices and standards of excellence in slide design. Next, because one of the most common deficiencies in technical presentations is the speaker's inability to effectively describe and explain visuals, the specific skill of talking an audience through graphical evidence will be addressed. Participants are encouraged (not required) to bring slide design/graphical evidence examples on a flash drive.

Nanostructure by Atomic PDF Analysis I / Pikes Peak 3 & 4

Organizer & Instructor:

V. Petkov, *Central Michigan University, Mt. Pleasant, MI, petkov@phy.cmich.edu*

This full day workshop will start with a brief introduction and continue with a hands-on training on the atomic PDF analysis from XRD data reduction into atomic PDFs to structure determination based on atomic PDFs. Attendees should install the following free software:

RAD: www.phy.cmich.edu/people/petkov/software.html

PDFgui: www.diffpy.org/download.shtml

DISCUS: www.sourceforge.net/projects/discus/files

and come to the workshop with their laptops. Attendees are also encouraged to bring data sets of their own.

TUESDAY am **XRF**

Fundamentals of Digital Signal Processing and X-ray Detectors / Gold Camp

Organizer & Instructors:

S. Hayakawa, *Hiroshima University, Hiroshima, Japan, hayakawa@hiroshima-u.ac.jp*

J. Kawai, *Kyoto University, Kyoto, Japan*

S. Terada, *X-Bridge Technologies, Kyoto, Japan*

T. Papp, *Cambridge Scientific, Ontario, Canada*

This workshop will introduce various X-ray detectors (Si, Ge, and CdTe SSD, SDD, Si-PIN, proportional counter) and then what is done in the digital signal processors of X-ray spectrometers is explained. The workshop covers (1) basics of DSP (digital signal processor) and digital oscilloscope, (2) deadtime correction, (3) peak stability and calibration, (4) linear and non-linear response, (5) low energy tail, (6) trade-offs among energy resolution, throughput and effective area, (7) escape peaks, sum peaks, and pile-up signals, (8) Fano factor, (9) how to determine the best set of parameters, and (10) near room temperature operation.

Quantitative Analysis I / Centennial

Organizer & Instructors:

M. Mantler, *Rigaku Corporation, Purkersdorf, Austria, michael.mantler@rigaku.com*

B. Vrebos, *PANalytical, Almelo, The Netherlands*

W.T. Elam, *University of Washington APL, Seattle, WA*

Morning: Basic methods of quantitative analysis:

1. Theoretical and mathematical foundation: Classical fundamental parameter models.
2. Practical application: Working curves and influence coefficients, compensation methods.

WORKSHOPS

TUESDAY pm **XRD & XRF**

Nanostructure by Atomic PDF Analysis II / Pikes Peak 3 & 4

Organizer & Instructor:

V. Petkov, *Central Michigan University, Mt. Pleasant, MI, petkov@phy.cmich.edu*

Continuation of Part I.

TUESDAY pm **XRD**

In-situ High Temperature XRD / Pikes Peak 1 & 2

Organizer & Instructors:

A. Payzant, *Oak Ridge National Laboratories, Oak Ridge, TN, payzanta@ornl.gov*

A. Drews, *Ford Motor Co., Research & Advanced Engineering, Dearborn, MI*

S. Speakman, *Massachusetts Institute of Technology, Cambridge, MA*

M. Kramer, *Iowa State Univ., Ames Lab, Ames, IA*

High-temperature XRD is particularly useful for determining lattice thermal expansion, structure of materials at high temperatures, for following reaction pathways and kinetics in single phase and multiphase materials. However, there are many issues that can trip up the unwary, such as thermal gradients, unwanted reactions, specimen volatility, systematic errors, etc. In addition to discussing these issues, with practical examples from the instructors' labs, this workshop will also provide recommendations on how to collect HTXRD data on laboratory instruments, and additionally provide information on potentially useful synchrotron and neutron beamlines for high-temperature studies.

TUESDAY pm **XRF**

Sampling Theory, Practice and Quality Control / Gold Camp

Organizers & Instructors:

J.A. Anzelmo, *Anzelmo & Associates, Inc., Madison, WI, jaanzelmo@aol.com*

M.A. Zaitz, *IBM, Hopewell Junction, NY, zaitz@us.ibm.com*

F. Pitard, *Francis Pitard Sampling Consultants, LLC, Broomfield, CO*

J. Tully, *Retsch Corporation, Newtown, PA*

Previous workshops have concentrated on specimen preparation, assuming correct sampling theory and practice. This workshop will concentrate on the theory and practice of the sampling process that ultimately strives to provide a representative sample to the laboratory for specimen preparation. Fundamental statistics, common sampling errors at mines, shipping, and exploration, and monitoring the results of analysis in the laboratories will be discussed. The equipment used during the sampling process will also be discussed.

Quantitative Analysis II / Centennial

Organizer & Instructors:

M. Mantler, *Rigaku Corporation, Purkersdorf, Austria, michael.mantler@rigaku.com*

B. Vrebos, *PANalytical, Almelo, The Netherlands*

W.T. Elam, *University of Washington APL, Seattle, WA*

Afternoon: Advanced methods of quantitative analysis:

1. Non-ideal samples (inhomogeneous samples, rough surfaces).
2. Analysis by using X-ray optics (micro-spots, confocal XRF).

POSTER SESSIONS

Monday, 1 August – XRD Poster Session



PANalytical



The Monday evening XRD Poster Session will be held 5:00–7:00 pm in the Summit Ballroom on the 4th floor of the hotel, in conjunction with a Wine & Cheese Reception sponsored by PANalytical and ICDD.

- D-3: **An In-Situ X-ray Diffraction Study of Reduction of Nickel Oxide by Hydrogen**
J.H. Li, A. Tripathi, A. Takase, L. Fields, T. McNulty, Rigaku Americas Corporation, The Woodlands, TX
- D-6: **High-Efficiency Laboratory SAXS/GISAXS/WAXS Instrument for Nanomaterials Characterization**
L. Fan, M. Degen, S. Bendle, P. Pennartz, N. Grupido, Rigaku Innovative Technologies Inc., Auburn Hills, MI
- D-11: **Application of Line Profile Analysis to Evaluation of Microstructural Recovery Accompanied with Precipitation in Aged Alloys**
S. Sato, A. Hasegawa, K. Wagatsuma, S. Suzuki, Tohoku University, Sendai, Japan
Y. Takahashi, Nissan Arc, Ltd., Yokosuka, Japan
- D-12: **Is Onset of Gamma-Alumina Recrystallization Dependent on Crystallite Size? A Comparison of In-Situ Calcinations by High Temperature XRD and Conventional Ex-Situ Calcinations with Standard Powder XRD**
C.L. Nicholas, C.K. Costello, A.Z. Ringwelski, M.A. Vanek, UOP LLC, A Honeywell Company, Des Plaines, IL
- D-15: **Synchrotron Powder Diffraction Simplified: The High-Resolution Diffractometer 11-BM at the Advanced Photon Source**
L. Ribaud, M.R. Suchomel, R.B. Von Dreele, B.H. Toby, Argonne National Laboratory, Argonne, IL
- D-18: **X-ray Diffraction Characterization of New Ternary Yttrium–Rare Earth Oxides Formed By the Sol–Gel Technique**
G. Rafailov, Z. Porat, I. Dahan, Nuclear Research Center, Negev, Beer-Sheva, Israel
Z. Porat, J. Zabicky, D. Moglyanski, K. Rechav, G. Kimmel, Ben-Gurion University of the Negev, Beer-Sheva, Israel
- D-23: **The Development and Evaluation of a New SAXS System for Biological Samples**
K. Sasaki, A. Criswell, J. Ferrara, Rigaku Americas Corporation, The Woodlands, TX
N. Suzuki, Chiba University, Chiba, Japan
L. Jiang, M. Degen, Rigaku Innovative Technologies, Auburn Hills, MI
- D-24: **Raman and X-ray Diffraction Studies on BaReH₇: High Volumetric Capacity Hydrogen Storage Material**
W.K. Wanene, D. Chandra, University of Nevada, Reno, Nevada
M. Somayazulu, S.A. Gramsch, R.J. Hemley, Carnegie Institution of Washington, Washington, DC
R.S. Chellappa, Los Alamos National Laboratory, Los Alamos, NM
S.V. Raju, S.M. Clark, Lawrence Berkeley National Laboratory, Berkeley, CA
- D-26: **The Crystal-Structure of Mn-doped LiFePO₄: A Combined Neutron and X-ray Diffraction Study**
N. Sharma, V.K. Peterson, The Bragg Institute, Kirrawee, Australia
C. Feng, H. Li, Hubei University, Wuhan, China
G. Du, Z. Guo, H. Liu, University of Wollongong, Australia
- D-27: **Microstructure of Plastic Bonded Explosives PBX**
M. Herrmann, P.B. Kempa, U. Förter-Barth, Fraunhofer Institute Chemical Technology ICT, Pfinztal, Germany
W. Arnold, MBDA-TDW, Schrobenhausen, Germany
- D-28: **Powder X-ray Diffractometer with Easily Mount/Dismountable K α ₁ Optics Unit**
T. Konya, T. Osakabe, K. Nagao, T. Kubo, Y. Ueji, R. Matsuo, T. Ozawa, Rigaku Corporation, Tokyo, Japan
L. Jiang, B. Verman, Rigaku Innovative Technologies, Inc., Auburn Hills, MI
- D-32: **Synchrotron X-ray Microbeam Characterization of Liquid Crystal**
A. Iida, Institute of Materials Structure Science, Tsukuba, Ibaraki, Japan
Y. Takanishi, Kyoto University, Sakyo, Kyoto, Japan
- D-33: **Nano-Beam X-ray Diffraction Reveals Structural Properties in Graded Nano-Crystalline Ti_{1-x}Al_xN Thin Films at Different Stages of Spinodal Decomposition**
M. Bartosik, A. Gaitzenauer, J. Keckes, Austrian Academy of Sciences, Austria
R. Daniel, C. Mitterer, Montanuniversität Leoben and Christian Doppler Laboratory for Advanced Hard Coatings, Austria
M. Burghammer, European Synchrotron Radiation Facility, Grenoble, France
- D-36: **Multilayer Optics for X-ray Analytics**
A. Kleine, B. Hasse, C. Michaelsen, J. Wiesmann, A. Hembd, U. Heidorn, S. Kroth, F. Hertlein, Incoatec GmbH, Geesthacht, Germany
- D-44: **Rietveld Quantitative Analysis of Super Duplex Stainless Steel**
J.L. Garin, R.L. Mannheim, Universidad de Santiago de Chile, Santiago, Chile
M.A. Camus, Universidad de Antofagasta, Antofagasta, Chile
- D-48: **The Grey Goo' on Chocolate: Fat-Bloom Characterization by GISAXS**
P. Laggner, M. Kriechbaum, IBN, Austrian Academy of Sciences, Graz, Austria
M. Weygand, Hecus X-ray Systems GmbH, Graz, Austria
- D-51: **Sorption and Nanostructure – Pressure-Scanning SAXS on Porous Materials**
P. Laggner, M. Schmuck, IBN, Austrian Academy of Sciences, Graz, Austria
M. Kriechbaum, IBN, Austrian Academy of Sciences, Austria and Hecus X-ray Systems GmbH, Austria
- D-52: **Investigating the Detection Limits of a Rotating Anode X-ray Diffractometer for Oil Sands Samples**
M.R. Afara, R.J. Mikula, Natural Resources Canada, Devon, AB, Canada

POSTER SESSIONS

- D-53: A Means for Assessing the Effectiveness of the Shot Peening Process as It Relates to Fatigue Performance**
D.J. Snoha, S.M. Grendahl, *U.S. Army Research Laboratory, MD*
B.S. Matlock, *Technology for Energy Corporation, Knoxville, TN*
- D-78: Development of a New Diffractometer for the Evaluation of a Very Micro Area**
M. Maeyama, S. Yasukawa, D. Iino, K. Itoh, T. Yoshida, H. Kawasaki, S. Yoshihara, K. Wakasaya, *Rigaku Corporation, Tokyo, Japan*
- D-81: Effect of Systematic Errors on Lattice Parameter Refinement**
A. Takase, *Rigaku Americas Corp., The Woodlands, TX*
- D-89: Addressing Industrial Problems Using X-ray Diffraction at the Advanced Photon Source**
J. Okasinski, M. Suchomel, J. Almer, L. Ribaud, B.H. Toby, *Argonne National Laboratory, Argonne, IL*
- D-91: X-ray Analysis of Pulsed Laser Deposition of Bi₂Te₃ Thin Film Layer**
L.S. Faraji, R.P. Singh, *Oklahoma State University, Tulsa, OK*
- D-95: Rietveld Refinement with a Model That Considers Crystallite Size Distribution and Anisotropic Crystallite Shape**
O. Ovalle, X. Bokhimi, *Instituto de Física, Universidad Nacional Autónoma de México, Mexico*
- D-96: An Approach to Quantitative Interpretation of XRD Patterns of Mineral Mixtures Using Standard Reference Minerals and Their FWHM in the PXRD-Whole Rock Diffractograms**
D. Alaygut, B. Canga, *Turkish Petroleum Corp. Research Center, Ankara, Turkey*
- D-99: X-ray Diffraction Measurement of Residual Stress in the Damaged Blade Sample of Gas Turbine Engine**
S. Shen, A.H. Mustafa, I. Taie, G. Alabedi, S.R. Zaidi, *Saudi Aramco, Dhahran, Saudi Arabia*
- D-102: The Effect of Grain Size on the Semiconducting, Electrical, and Structural Properties of Zinc Oxide**
R. Mansourian, G.B. González Avilés, *DePaul University, Chicago, IL*
- D-103: Multivariate Statistical Analysis of Micro-XRF Spectral Images from a Bruker M4 Tornado System**
M.A. Rodriguez, P.G. Kotula, D.E. Wesolowski, J.E. Heath, S.J. Bauer, *Sandia National Laboratories, Albuquerque, NM*
- D-112: Searching For a Refinable Model of a Nanocrystal**
B.F. Palosz, *Polish Academy of Sciences, Warsaw, Poland*
- D-113: Surface Relaxation in Nano-Diamonds Examined with Application of Real and Reciprocal Space Methods**
S. Stelmakh, E. Grzanka, S. Gierlotka, B. Palosz, *Polish Academy of Sciences, Warsaw, Poland*
- D-116: Experiment Verification for the Dependence of the X-ray Diffraction Line Profile with the Absorption of Sample**
K. Liu, H. Chen, *Shanghai Institute of Technology, Shanghai, China*
- D-117: Novel Acoustic Emission and XRD In-Situ Cell for Characterization of Lithium Ion Batteries**
K. Rhodes, C. Daniel, *University of Tennessee, Knoxville, TN*
M.J. Kirkham, R.A. Meisner, E.A. Payzant, N. Dudney, C. Daniel, *Oak Ridge National Laboratory, Oak Ridge, TN*
- D-118: X-ray Scattering Analysis of Petroleum Micro-Crystalline Wax (MCW)**
B.K. Saikia, R. Prajapati, *Indian Oil Corporation Ltd., Haldia Refinery, Haldia, India*
A. Gogoi, R.K. Boruah, *North-east Institute of Science & Technology (CSIR), Jorhat, India*
- D-119: The Study of Micronization Induced Disorder and Environmental Annealing of an Active Pharmaceutical Ingredient (API) by XRPD Line Broadening Analyses**
G.R. Williams, J. Brum, *GlaxoSmithKline, King of Prussia, PA*
- D-120: Minimizing the Effects of Preferred Orientation in X-ray Powder Diffraction**
G.R. Williams, F. Kang, *GlaxoSmithKline, King of Prussia, PA*
B. Litteer, R. Kerstens, *PANalytical, Inc., Westborough, MA*
J. Smith, *PANalytical, Inc., Richboro, PA*
- D-121: Coherent and Incoherent X-ray Scattering From Partly Relaxed Semiconductor Structures Possessing Dislocations**
A. Ulyanenkova, T. Ulyanenkova, *Rigaku Europe SE, Berlin, Germany*
A. Benediktovitch, A. Zhilik, I. Feranchuk, *Belarusian State University, Minsk, Belarus*
K. Saito, *Rigaku Corporation, Tokyo, Japan*

POSTER SESSIONS

Tuesday, 2 August – XRF and Core Shell Spectroscopy Poster Session

The Tuesday evening XRF Poster Session will be held 5:00 – 7:00 pm in the Summit Ballroom on the 4th floor of the hotel, in conjunction with a Wine & Cheese Reception sponsored by Chemplex Industries, Inc.

- C-2: Development of a Quasi-Monochromatic X-ray Source Based On an Electrostatic Ion Accelerator**
V. Yu. Storizhko, S.O. Vershynskiy, V.L. Denysenko, *Institute of Applied Physics, Sumy, Ukraine*
- C-8: Non-Destructive Fingerprinting of Pharmaceutical Compounds with a Low-Cost, Small Footprint Bench-Top XRD System, the BTX**
J. Brum, *Olympus Innov-X Systems, Inc., Woburn, MA*
- C-9: The BTX Bench-Top XRD Analysis for Feed & Fertilizer Formulations**
J. Brum, *Olympus Innov-X Systems, Inc., Woburn, MA*
- F-8: Comparison of Sample Preparation Approaches for TXRF using Different pL Pipetting Systems**
M. Menzel, U.E.A. Fittschen, *University of Hamburg, Hamburg, Germany*
G. Havrilla, *Los Alamos National Laboratory, Los Alamos, NM*
U. Waldschläger, *Bruker Nano GmbH, Berlin, Germany*
- F-12: Combined Phase and X-ray Fluorescence Imaging at the Sub-Cellular Level**
E. Kosior, P. Cloetens, *ESRF, Grenoble, France*
S. Bohic, *ESRF, Grenoble, France and INSERUM U-836, Grenoble, France*
- F-16: Re-Configurable Digital Pulse Processor for High-Rate High-Resolution X-ray Spectroscopy**
R. Alberti, T. Frizzi, S. Moser, *XGLab SRL, Milano, Italy*
A. Abba, L. Bombelli, A. Geraci, *Politecnico di Milano, Dip. Elettronica e Informazione, Milano, Italy*
- F-17: Handheld XRF Screening for Dangerously High Levels of Toxic Metals in Developing Countries**
K. Russell, *Olympus Innov-X, Woburn, MA*
- F-18: Handheld XRF Soil Analysis for Precision Agriculture and Peri-Urban Farming Applications**
K. Russell, *Olympus Innov-X, Woburn, MA*
- F-26: Quantitative Combined XRF and EPMA Analysis in the SEM**
B.J. Cross, *CrossRoads Scientific, El Granada, CA*
K.C. Witherspoon, *IXRF Systems, Inc., Houston, TX*
- F-28: Evaluating XRF Na and Cl Measurements in Particulate Matter Samples**
H. Indresand, A.M. Dillner, *University of California, Davis, CA*
- F-30: Application of Fusion Bead Correction in XRF Analysis of Powders**
H. Homma, H. Inoue, Y. Kataoka, *Rigaku Corporation, Osaka, Japan*
M. Feeney, L. Oelofse, L.A. Fields, *Rigaku Americas Corporation, The Woodlands, TX*
- F-39: Analysis of TCLP Extracts by X-ray Fluorescence**
D.S. Kendall, B.A. Burns, J.A. Suggs, *U.S. EPA, Denver, CO*
- F-41: Miniature Tube and Detector Modeling of Portable XRF Instrumentation**
D. Couto, *Olympus Innov-X, Woburn, MA*
- F-44: X-ray Fluorescence Analysis of Mexican Varieties of Dried Chili Peppers**
E. Romero-Dávila, *Eton School, Mexico*
J. Miranda, *Instituto de Física, Universidad Nacional Autónoma de México, México*
- F-45: Elemental Analysis of Fresh and Waste Water From Industrial Sources Using Total Reflection X-ray Fluorescence (TXRF) Spectroscopy**
M. Beauchaine, *Bruker AXS Inc., Madison, WI*
- F-46: On the Use of Monte Carlo Based Methods to EDXRF Qualitative Analysis**
F. Li, *Baker Hughes, Houston, TX*
J. Wang, R. Gardner, *North Carolina State University, Raleigh, NC*
- F-48: A Noise Reduction Algorithm for Digital Signal Processors**
Y. Nakaye, J. Kawai, *Kyoto University, Kyoto, Japan*
- F-52: Improvement of Detection Limits of a Portable TXRF by Reducing Electrical Noise**
S. Imashuku, D.P. Tee, Y. Nakae, J. Kawai, *Kyoto University, Kyoto, Japan*
- F-53: Influence of the Excitation Energy on Absorption Effects in TXRF Analysis**
C. Horntrich, P. Kregsamer, S. Smolek, A. Maderitsch, P. Wobrauschek, C. Strelí, *Atominstytut, Vienna, Austria*
R. Simon, *Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany*
A. Nutsch, *Fraunhofer Institute for Integrated Systems and Device Technology, Erlangen, Germany*
M. Knoerr, *Fraunhofer Institute for Integrated Systems and Device Technology, Nürnberg, Germany*
- F-54: Improvement of Calibration Processes in TXRF of Wafer Surface Analysis: Investigation of Saturation Effects in TXRF by Comparing Different Sample Shapes**
C. Horntrich, P. Kregsamer, S. Smolek, A. Maderitsch, P. Wobrauschek, C. Strelí, *Atominstytut, Vienna, Austria*
R. Simon, *Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany*
A. Nutsch, *Fraunhofer Institute for Integrated Systems and Device Technology, Erlangen, Germany*

POSTER SESSIONS

- F-62: Differential Accumulation of Lead in Double-Tidemarks in Articular Cartilage of Osteoarthritic Human Joints**
A. Roschger, B. Pemmer, P. Wobrauschek, C. Strelj, *Atominstytut, Vienna, Austria*
A. Roschger, J.G. Hofstaetter, P. Roschger, K. Klaushofer, *Hanusch Hospital, Vienna, Austria*
J.G. Hofstaetter, *Hanusch Hospital, Austria and Medical Univ. of Vienna, Austria*
R. Simon, *Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany*
- F-63: Trace Element Distribution in Trabecular and Cortical Bone of Fractured Femoral Necks of Postmenopausal Osteoporotic Women: A Synchrotron Micro X-ray Fluorescence Imaging Study**
B. Pemmer, A. Roschger, P. Wobrauschek, C. Strelj, *Atominstytut, Vienna, Austria*
A. Roschger, J.G. Hofstaetter, P. Roschger, K. Klaushofer, *Hanusch Hospital, Vienna, Austria*
J.G. Hofstaetter, *Hanusch Hospital, Austria and Medical Univ. of Vienna, Austria*
R. Simon, *Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany*
- F-64: Analytical Possibilities of Total Reflection X-ray Spectrometry (TXRF) for Trace Selenium Determination in Soils and Leaching Solutions**
E. Margui, G.H. Floor, M. Hidalgo, G. Roman-Ross, *University of Girona, Girona, Spain*
C. Strelj, *Atominstytut, Vienna, Austria*
I. Queralt, *Institute of Earth Sciences "Jaume Almera", CSIC, Barcelona, Spain*
- F-65: Determination of Catalyst Residues in Active Pharmaceutical Ingredients by Means of Total Reflection X-ray Spectrometry (TXRF)**
E. Margui, M. Hidalgo, *University of Girona, Girona, Spain*
P. De Pape, *Bruker AXS GmbH, Karlsruhe, Germany*
I. Queralt, *Institute of Earth Sciences "Jaume Almera", CSIC, Barcelona, Spain*
- F-66: Speciation of Pb at the Tidemark of Articular Cartilage and in Trabecular Bone**
B. Pemmer, N. Zoeger, C. Strelj, *Atominstytut, Vienna, Austria*
G. Pepponi, *MiNALab, Trento, Italy*
F. Meirer, *Atominstytut, Vienna, Austria and MiNALab, Trento, Italy*
J. Goettlicher, R. Steininger, S. Mangold, *Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany*
A. Tampieri, S. Sprio, *Istituto di Scienza e Tecnologia dei Materiali Ceramici CNR, Faenza, Italy*
P. Roschger, K. Klaushofer, *Hanusch Hospital, Vienna, Austria*
J.G. Hofstaetter, *Hanusch Hospital, Austria and Medical Univ. of Vienna, Austria*
- F-67: Moving To High Detection Efficiency, Low Background Silicon Drift Detectors**
A. Niculae, J. Herrmann, M. Bornschlegel, O. Jaritschin, *PNDetector GmbH, Munich, Germany*
R. Eckhardt, S. Jeschke, P. Lechner, L. Mungenast, B. Schweinfest, H. Soltau, *PNSensor GmbH, Munich, Germany*
L. Andricek, L. Strüder, *MPI Halbleiterlabor, Munich, Germany*
- F-68: X-ray Fluorescence Analysis of Round Robin Samples: Andesite, MGL-AND and Ordinary Portland Cement, OPC-1**
D.M. Missimer, R.L. Rutherford, *Savannah River National Laboratory, Aiken, SC*
- F-70: Pulsed X-ray Characterization of Stripline Microchannel Plate Gated Imager**
E.J. Goldin, D. Morgan, K. Moy, *National Security Technologies, LLC, North Las Vegas, NV*
- F-72: Characterization of Sub-Micron Thin Films and Multilayers by Energy Dispersive X-ray Fluorescence**
I. Queralt, *Institute of Earth Sciences Jaume Almera, Barcelona, Spain*
E. Margui, *University of Girona, Girona, Spain*
X. Llovet, *Universitat de Barcelona, Barcelona, Spain*
J. Pujol, *Fischer Instruments SA, Barcelona, Spain*
F.J. Piniella, *Autonomous University of Barcelona, Barcelona, Spain*
- F-82: Detection Limits of Optic-Enabled Field-Portable XRF Systems**
B. Beumer, Z.W. Chen, *XOS, East Greenbush, NY*

Core Shell Spectroscopy

- S6 Time Resolved In Situ QXAFS and DXAFS Studies on the Formation and Oxidation Mechanisms of Paradium-Zinc Bimetallic Nanoparticles**
Y. Uemura, Y. Niwa, A. Yagishita, M. Nomura, *KEK-PF, Ibaraki, Japan*
Y. Inada, *Ritsumeikan University*
M. Kimura, *Nippon Steel Corporation*
K.K. Bando, *AIST*
Y. Iwasawa, *Univ. Electro-Commun.*
- S7 In Situ XAFS Investigation of PT-FE and PT-NI Nano-Catalysts at XAFS Beamline of SSRF**
Y. Huang, Z. Jiang, *Shanghai Synchrotron Radiation Facility, Chinese Academy of Sciences, Shanghai, China*
Q. Fu, X. Bao, *Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China*
- S10 2D Imaging Quick XAFS with Pixel Array Detector**
H. Tanida, Y. Orikasa, H. Yamashige, K. Sato, D. Takamatsu, Y. Takanashi, T. Fujimoto, H. Murayama, M. Oishi, H. Arai, E. Matsubara, Y. Uchimoto, Z. Ogumi, *Kyoto University, Kyoto, Japan*
- S12 Improvement in the Reduction Behavior of ZrO₂-CeO₂ Nanotubes by Incorporation of Pd**
L.M. Acuña, F.F. Muñoz, M.D. Cabezas, R.O. Fuentes, *CINSO, CONICET, Villa Martelli, Buenos Aires, Argentina*
M.C.A. Fantini, *Universidade de Sao Paulo, Sao Paulo, SP, Brazil*
D.G. Lamas, *FAIN, UNCOMA, and IDEPA-CONICET, Neuquén, Argentina*
R.T. Baker, *University of St. Andrews, North Haugh, St. Andrews, UK*

SPECIAL SESSIONS / WEDNESDAY, THURSDAY & FRIDAY 3-5 AUGUST

WEDNESDAY am PLENARY SESSION

Foods & Drugs / Summit Ballroom: 4th floor of hotel

Chairs: **T. G. Fawcett**, *International Centre for Diffraction Data, Newtown Square, PA*
Mary Ann Zaitz, *IBM, Hopewell Junction, NY*

8:30 **Chairman of the Denver X-ray Conference Opening Remarks**
Robert L. Snyder, *Georgia Institute of Technology, Atlanta, GA*

PRESENTATION OF AWARDS:

2011 Barrett Award

Presented to: **Dr. Juan Rodriguez-Carvajal**, *Lab. Leon Brillouin, CEA-CNRS, Gif Sur Yvette, France*
Presented by: **Cev Noyan**, *Columbia University, New York, NY*

2011 Jenkins Award

Presented to: **Dr. Paul K. Predecki**, *The University of Denver, Denver, CO*
Presented by: **T.G. Fawcett**, *International Centre for Diffraction Data, Newtown Square, PA*

Plenary Session Remarks by the Chairs

9:00 **D-104 Edible Nanostructures – The Pleasures of Chocolate**
Alejandro G. Marangoni, *University of Guelph, Guelph, ON, Canada*

9:45 **F-31 From the Field to the Lab – FDA Use of XRF to Monitor Foods, Drugs and Other Consumer Products**
Peter T. Palmer, *San Francisco State University, San Francisco, CA*
R. Jacobs, S. Yee, C. Qiu, M. Nausin, C. Castro, M. Muckenfuss, *FDA, Alameda, CA*

10:30 **BREAK**

11:00 **F-76 What Else Are You Drinking When You Drink Whiskey or Wine?**
Peter Wobrauschek, *TU Wien, Atominstytut, Wien, Austria*

11:45 **D-111 X-ray Powder Diffraction in the Pharmaceutical Industry**
G.A. Stephenson, *Eli Lilly and Company, Indianapolis, IN*

WEDNESDAY pm XRD AND XRF

Energy Storage & Harvesting / Pikes Peak 3 & 4

Chair: **M.A. Rodriguez**, *Sandia National Laboratories, Albuquerque, NM*

1:30 **D-64 Invited – X-ray Diffraction Analyses of Lithium Battery Materials**
A. Drews, *Ford Motor Company, Dearborn, MI*

2:00 **D-25 Invited – Using Neutron Scattering to Study Lithium-Ion Batteries**
N. Sharma, V.K. Peterson, *The Bragg Institute, ANSTO, Kirrawee, Australia*

2:30 **C-22 XRS for Li-Ion Batteries**
U. Boesenberg, J. Cabana, T. Richardson, R. Kostecki, *LBNL, Berkeley, CA*
D. Sokaras, T.C. Weng, D. Nordlund, *SSRL, Menlo Park, CA*

2:50 **D-72 In-Situ X-ray Diffraction from Lithium Ion Batteries**
J. Okasinski, *Argonne National Laboratory, Argonne, IL*
C. Hayner, H. Kung, *Northwestern University, Evanston, IL*

3:10 **BREAK**

3:40 **D-9 Invited – Using In-Situ Techniques to Probe High Temperature Reactions: Thermochemical Cycles for the Production of Synthetic Fuels from CO₂ and Water**
E.N. Coker, M.A. Rodriguez, A. Ambrosini, J.E. Miller, *Sandia National Laboratories, Albuquerque, NM*

4:10 **D-29 New Fast In-Situ XRD System Allows Growth Studies of Thin Films for Photovoltaics**
A. Haase, M. Klatt, A. Schafmeister, R. Stabenow, *GE Sensing & Inspection Technologies, Ahrensburg, Germany*
I. Kötschau, *Centrotherm Photovoltaics AG, Blaubeuren, Germany*

4:30 **F-57 EDXRF Analysis of Cu(In,Ga)(S,Se)₂ Photovoltaic Films (The S-Mo Conundrum)**
J.R. Bogert, *Solar Metrology/PFT, Holbrook, NY*

SPECIAL SESSIONS

New Developments in XRD & XRF Instrumentation / Centennial

Chair: **T.G. Fawcett**, *International Centre for Diffraction Data, Newtown Square, PA*

- 1:00 **C-11 “CUBE”, A Low-Noise CMOS Preamplifier as Alternative to JFET Front-End For Silicon Drift Detectors**
L. Bombelli, C. Fiorini, A. Longoni, *Politecnico di Milano, Milano, Italy*
T. Frizzi, R. Nava, *XGLab SRL, Milano, Italy*
- 1:15 **C-12 SOLEX: A Comprehensive Tool for Energy-Dispersive Detectors Characterization**
Y. Ménesguen, M.-C. Lépy, *CEA-Saclay, France*
- 1:30 **C-13 Detectors for X-ray Imaging at the New Free Electron Laser Sources**
J. Treis, *PNDetector GmbH, Munich, Germany*
S. Aschauer, R. Hartmann, K. Hermenau, P. Lechner, G. Lutz, P. Majewski, C. Sandow, H. Soltau, C. Thamm, *PNSensor GmbH, Munich, Germany*
L. Andricek, S. Herrmann, M. Porro, R. Richter, G. Schaller, F. Schopper, L. Strüder, G. de Vita, *MPI Halbleiterlabor, Munich, Germany*
- 1:45 **C-15 Design and Measurement with a New Portable X-ray Camera**
I. Ordavo, U. Weber, *PNDetector GmbH, Munich, Germany*
S. Ihle, R. Hartmann, H. Soltau, M. Lang, A. Liebel, C. Thamm
PNSensor GmbH, Munich, Germany
G. Schaller, L. Strüder, *MPI Halbleiterlabor, Munich, Germany*
- 2:00 **C-17 Performance Improvements in Miniature X-ray Tubes**
S. Cornaby, D. Reynolds, V. Jones, M. Heber, C. Jensen, *Moxtek, Inc., Orem, UT*
- 2:15 **D-8 Liquid Metal Jet Micro-Focus X-ray Source: Highest Brilliance for Home Lab Instrumentation**
C. Ollinger, A. Kern, *Bruker AXS, Karlsruhe, Germany*
- 2:30 **D-19 Integration of High-Brilliance Laboratory SWAXS with Microcalorimetry**
P. Laggner, M. Kriechbaum, *IBN, Austrian Academy of Sciences, Graz, Austria*
A. Hodzic, *Research Center for Pharmaceutical Engineering, Graz, Austria*
P. Le Parlouer, *Setaram Instrumentation, Caluire, France*
- 2:45 **D-31 Pilatus Detectors—Next Generation Instruments for Advanced X-ray Diffraction Studies**
M. Kobas, *DECTRIS Ltd., Baden, Switzerland*
- 3:00 **BREAK**
- 3:30 **D-35 High-Brilliance Low-Maintenance Microfocus Sources for Diffractometry**
B. Hasse, A. Kleine, J. Graf, J. Wiesmann, C. Michaelsen, *Incoatec GmbH, Geesthacht, Germany*
- 3:45 **D-47 Computer-Aided Engineering Design of HTXRD Resistive Heating Strips To Minimize Sample Temperature Gradient**
R. Chandrasekaran, A. Drews, *Ford Motor Company, Dearborn, MI*
- 4:00 **D-56 New Instrumentation for X-ray Micro Diffraction**
H.R. Ress, B. He, B. Jones, *Bruker AXS, Madison, WI*
C. Ollinger, G. Vanhoyland, *Bruker AXS, Karlsruhe, Germany*
- 4:15 **D-94 Advanced Guinier-Type Powder Instrumentation**
R. Dietsch, T. Holz, *AXO DRESDEN GmbH, Dresden, Germany*
S.J.H. Griessl, N. Huber, *Huber Diffraktionstechnik GmbH & Co. KG, Rimsting, Germany*
H. Borrmann, *Max Planck Institute for Chemical Physics of Solids, Dresden, Germany*
- 4:30 **D-101 Improved Source and Multilayer Optics Integration for Fast and Local XRD Measurements**
S. Rodrigues, P. Panine, P. Høghøj, *Xenocs, Sassenage, France*
- 4:45 **F-13 560 mm² SDD Array**
A. Pahlke, T. Eggert, R. Fojt, L. Höllt, J. Knobloch, S. Pahlke, O. Scheid, R. Stötter, F. Wiest, *KETEK GmbH, Munich, Germany*
- 5:00 **F-19 Ultra-Fast Compact Multi-Channel Readout System for SDDs**
R. Alberti, T. Frizzi, S. Moser, *XGLab SRL, Milano, Italy*
L. Bombelli, C. Fiorini, R. Quaglia, *Politecnico di Milano, Milano, Italy*
- 5:15 **F-37 Coupling X-ray Spectroscopy and Scanning Probe Microscopy for Simultaneous Sample Topography and Chemical Mapping**
M. Dehlinger, C. Fauquet, F. Jandard, D. Tonneau, *Université de la Méditerranée, Marseille, France*
J. Purans, *University of Latvia, Latvia*
D. Pailharey, S. Ferrero, *Cie Axess Tech, Saint Cannat, France*
B. Dahmani, *Cie Loyalite, Besançon, France*
A. Bjeoumikhov, *IFG-GmbH, Berlin, Germany*
I. Zizak, A. Erko, *HZB-BESSY, Berlin, Germany*

SPECIAL SESSIONS / WEDNESDAY, THURSDAY & FRIDAY 3-5 AUGUST

- 5:30 **F-47 Simplified Biasing Schemes For Silicon Drift Detectors**
D. Hullinger, K. Decker, Moxtek, Orem, UT
H. Matsuura, Osaka Electro-Communication University, Neyagawa, Osaka, Japan
- 5:45 **D-115 From Sub-Monolayer to Monolayer Transition of Silver Nanoparticle Langmuir Film at the Air-Water Interface – Pilot Application of a New GISAXS Laboratory Set-Up**
K. Vegso, P. Siffalovic, M. Weis, E. Majkova, M. Jergel, M. Benkovicova, S. Luby, Institute of Physics SAS, Bratislava, Slovakia
J. Wiesmann, Incoatec GmbH, Geesthacht, Germany
T. Kocsis, Polymer Institute SAS, Bratislava, Slovakia
K. Nygard, O. Kononov, European Synchrotron Radiation Facility (ESRF), Grenoble, France

WEDNESDAY pm XRD

Line Profile Analysis / Pikes Peak 1 & 2

Chairs: **M. Leoni**, University of Trento, Trento, Italy
D. Balzar, University of Denver, Denver, CO

- 2:00 **D-4 Invited – 3D Measurements of Dislocations and Strain Gradients in the Near Surface Microstructures via Polychromatic Microdiffraction**
R.I. Barabash, ORNL, Oak Ridge, TN
- 2:30 **D-17 Invited – Characterizing Local Strain Tensors, Crystallographic Orientations and Defects Using Sub-Micrometer X-ray Beams, and Comparison with Conventional Line Profile Analysis**
L.E. Levine, NIST, Gaithersburg, MD
B.C. Larson, J.Z. Tischler, Oak Ridge National Laboratory, Oak Ridge, TN
P. Geantil, M.E. Kassner, University of Southern California, Los Angeles, CA
W. Liu, Argonne National Laboratory, Argonne, IL
- 3:00 **D-39 Invited – Structure/Microstructure Relationships in Defective and Nanostructured Materials**
M. Leoni, University of Trento, Trento, Italy
- 3:30 **BREAK**
- 4:00 **D-55 Peak Profiles From Faulting in Small Domains**
K.R. Beyerlein, Georgia Institute of Technology, Atlanta, GA, and University of Trento, Trento, Italy
R.L. Snyder, Georgia Institute of Technology, Atlanta, GA
P. Scardi, University of Trento, Trento, TN, Italy
- 4:20 **D-54 Dislocation Density, Character and Burgers Vector Types in Cubic and Hexagonal Close Packed Crystals Determined Together with Other Defects by Diffraction Line Profile Analysis Using Time of Flight Neutron Diffraction Measurements**
L. Balogh, D.W. Brown, C.N. Tome, B. Clausen, Los Alamos National Laboratory, Los Alamos, NM
- 4:40 **D-50 Validation of Fundamental Parameters Approach Software for Use in NIST SRM Certification**
K.M. Mullen, D. Windover, J.P. Cline, NIST, Gaithersburg, MD
D. L. Gil, Princeton University, Princeton, NJ

WEDNESDAY pm XRF

Fusion and Industrial Applications of XRF / Gold Camp

Chair: **J.A. Anzelmo**, Anzelmo & Associates, Inc., Madison, WI

- 1:30 **F-6 Invited – Applications of X-ray Fluorescence in the Copper Mining Industry**
S.W. Bowe, Kennecott Utah Copper, South Jordan, UT
- 2:00 **F-36 Picking Up the Challenge for Best Precision and Accuracy in Ferro Alloy Analysis**
K. Behrens, R. Zucic, Bruker AXS, Karlsruhe, Germany
A. Seyfarth, Bruker AXS, Madison, WI
M. Bouchard, J. Anzelmo, M.-È. Provencher, Corporation Scientifique Claisse, Quebec, Canada
- 2:20 **F-29 Strategy of Fusion Bead Correction in XRF Analysis of Powders**
H. Homma, H. Inoue, Y. Yamada, Y. Kataoka, Rigaku Corporation, Takatsuki, Osaka, Japan
M. Feeney, L. Oelofse, Rigaku Americas Corporation, The Woodlands, TX
- 2:40 **F-9 Cement Applications with Handheld XRF**
M. Cameron, Bruker Elemental, Kennewick, WA
- 3:00 **BREAK**
- 3:30 **F-80 Invited – Applications of X-ray Fluorescence for the Electronics Industry**
W.W. Brubaker, DuPont Central Research & Development, Wilmington, DE

SPECIAL SESSIONS

- 4:00 **F-20 Analysis of Minor and Trace Elements in Plutonium Using Polarized Energy Dispersive X-ray Fluorescence**
C.G. Worley, *Los Alamos National Laboratory, Los Alamos, NM*
- 4:20 **F-10 On-Stream XRF for Real-Time Monitoring of Trace Elements at Sub-Parts-Per-Million Levels**
Y. Van Haarlem, G. Roach, J. Tickner, *CSIRO, Lucas Heights, Australia*
- 4:40 **F-34 Flexibility and Performance for Process and Quality Control in Metal Production**
K. Behrens, D. Porta, *Bruker AXS, Karlsruhe, Germany*
A. Seyfarth, *Bruker AXS, Madison, WI*

WEDNESDAY pm

Core Shell Spectroscopy Specialized Session / El Paso Room

Chair: **C. Segre**, *Illinois Institute of Technology, Chicago, IL*

- 2:00 **S9 Nanoscale XANES Imaging of Battery Electrodes**
J.C. Andrews, Y. Liu, P. Pianetta, *SLAC National Accelerator Lab, Menlo Park, CA*
F. Meirer, *Fondazione Bruno Kessler, Povo, Italy*
J. Cabana, U. Boesenberg, *Lawrence Berkeley National Lab, Berkeley, CA*
- 2:20 **S3 Investigation of Magnetic Thin Films Using Polarization Dependent X-ray Absorption Near Edge Structure (XANES) Spectroscopy**
C.-J. Sun, S.M. Heald, *APS, Argonne National Laboratory, Argonne, IL*
- 2:40 **S14 Core-Level X-ray Absorption Spectroscopy Study of Actinide Intermetallics**
Y. Jiang, C.H. Booth, *Lawrence Berkeley National Laboratory, Berkeley, CA*
D. Nordlund, *Stanford Synchrotron Radiation Lightsource, Menlo Park, CA*
E.D. Bauer, J.N. Mitchell, *Los Alamos National Laboratory, Los Alamos, NM*
M.A. Wall, P.G. Allen, *Lawrence Livermore National Laboratory, Livermore, CA*
- 3:00 **BREAK**
- 3:30 **S13 Quantification in Soft X-ray Absorption Spectroscopy from Partial Fluorescence Yields**
T.Z. Regier, *Canadian Light Source, Inc., Saskatoon, Saskatchewan, Canada*
A.J. Achkar, D.G. Hawthorn, *University of Waterloo, Waterloo, Ontario, Canada*
E.J. Monkman, K.M. Shen, *Cornell University, Ithica, NY*
- 3:50 **S11 The Location of Carbon in Low-Temperature Carburized Stainless Steels: An XAFS Study**
W.E. O'Grady, P.M. Natishan, *Naval Research Laboratory, Washington, DC*
D.F. Roeper, *EXCET, Inc., Springfield, VA*
K.I. Pandya, *SAIC, Brookhaven National Laboratory, Upton, NY*
- 4:10 **S8 EXAFS Analysis of U (IV) Phases Resulting From the Bio-Reduction of Nanoparticulate Uranyl Phosphate**
X. Rui, B.A. Bunker, S. Dunham-Cheatham, J. Fein, *University of Notre Dame, Notre Dame, IN*
M. Boyanov, M.J. Kwon, E.J. O'Loughlin, K.M. Kemner, *Argonne National Laboratory, Argonne, IL*

THURSDAY am XRD & XRF

X-ray Imaging / Gold Camp

Chair: **M. Schuster**, *Siemens AG, München, Germany*

Co-chair: **F. de Carlo**, *Argonne National Laboratory, Argonne, IL*

- 8:30 **C-4 Invited – Fourier X-ray Scattering Imaging and Biological Applications**
H. Wen, V. Pai, S.K. Lynch, C.K. Kemble, E. Bennett, *National Institutes of Health, Bethesda, MD*
W.K. Lee, X. Xiao, L. Assoufid, C. Liu, *Argonne National Laboratory, Argonne, IL*
- 9:00 **D-37 X-ray Diffraction Nano-Tomography: Application to the Low Enriched Nuclear Fuels**
A. Bonnin, H. Palancher, *CEA, DEN, DEC, Cadarache, France and ESRF, Grenoble, France*
R. Tucoulou, P. Cloetens, V. Honkimäki, *ESRF, Grenoble, France*
P. Bleuet, *CEA, LETI, MINATEC, Grenoble, France*
- 9:20 **C-25 X-ray Reflection Tomography –First Results on Surface Imaging**
K. Sakurai, *Univ. of Tsukuba, Ibaraki, Japan and National Institute for Materials Science, Ibaraki, Japan*
V.A. Innis-Samson, *University of Tsukuba, Ibaraki, Japan*
M. Mizusawa, *National Institute for Materials Science, Ibaraki, Japan*
- 9:40 **C-23 Study of Microstructure and Hydraulic Properties of Geological Samples by Means of Microfocus X-ray Computed Tomography and Lattice Boltzmann Method**
J. Bielecki, J. Lekki, Z. Stachura, W.M. Kwiatek, *Polish Academy of Sciences, Krakow, Poland*
S. Bozek, *Polish Academy of Sciences and The Jagiellonian University Medical College, Krakow, Poland*
J. Jarzyna, *AGH University of Science and Technology, Krakow, Poland*

SPECIAL SESSIONS / WEDNESDAY, THURSDAY & FRIDAY 3-5 AUGUST

- 10:00 **D-65 High-Energy X-ray Scattering Tomography**
S.R. Stock, *Northwestern University, Chicago, IL*
J.D. Almer, *Argonne National Laboratory, Argonne, IL*
- 10:20 **BREAK**
- 10:40 **D-22 Invited – 4D Materials Science: In Situ X-ray Synchrotron Tomography of Deformation in Metallic Materials**
N. Chawla, J.J. Williams, N.C. Chapman, M.Y. Wang, *Arizona State University, Tempe, AZ*
X. Xiao, F. De Carlo, *Argonne National Laboratory, Argonne, IL*
- 11:10 **F-69 Gratings with Extreme Aspect Ratio for X-ray Phase Contrast Tomography at High Energies**
J. Mohr, T. Grund, J. Kennntner, V. Altapova, T. Baumbach, *Karlsruhe Institute of Technology, Karlsruhe, Germany*
I. Zanette, *European Synchrotron Radiation Facility, Grenoble, France*
T. Weitkamp, *Synchrotron Soleil, Gif-sur-Yvette, France*
- 11:30 **C-19 Multilayer Mirrors – Potentials for Monochromating, Collimating or Focusing Optics**
R. Dietsch, M. Kraemer, T. Holz, D. Weissbach, *AXO DRESDEN GmbH, Dresden, Germany*
A. Rack, *European Synchrotron Radiation Facility, Grenoble, France*
- 11:50 **C-3 Invited – High-Speed X-ray Full-Field Imaging Applications at the APS**
K. Fezzaa, *Argonne National Laboratory, Argonne, IL*
- 12:20 **C-20 Calibration of X-ray Imaging Devices for Accurate Intensity Measurement**
M.J. Haugh, M. Charest, P.W. Ross, J. Lee, *National Security Technologies, Livermore, CA*
N. Palmer, M.B. Schneider, *Lawrence Livermore National Laboratory, Livermore, CA*

THURSDAY am XRD

Rietveld Analysis I / Pikes Peak 3 & 4

Chair: **P.H.J. Mercier**, *National Research Council of Canada, Ottawa, Ontario, Canada*

- 9:00 **D-82 Invited – Software and Instrumentation for Rietveld Analysis: What's New and Some Prognostication**
B.H. Toby, *APS, Argonne National Laboratory, Argonne, IL*
- 9:30 **D-5 Invited – Crystal Structure of Monoclinic $\text{Sr}_{2.4}\text{Ca}_{0.6}\text{Al}_2\text{O}_6$**
J.A. Kaduk, *Illinois Institute of Technology, Chicago, IL*
W. Wong-Ng, *NIST, Gaithersburg, MD*
J. Golab, *INEOS Technologies, Naperville, IL*
- 10:00 **D-108 Phase Stability Study of $\text{Ni}_x\text{Mg}_{1-x}\text{Al}_2\text{O}_4$ via XRD and Complementary Techniques**
S.T. Misture, B.E. Hill, *Alfred University, Alfred, NY*
M.E. Miller, *Excelerant Ceramics, Alfred, NY*
- 10:20 **BREAK**
- 10:50 **D-106 Crystal Structure Study of Nanocrystalline Phase: $\text{Ca}_{1-x}\text{M}_x\text{Zr}_4\text{P}_6\text{O}_{24}$ (M= Sr, Ba & x=0.0-1.0)**
O.P. Shrivastava, R. Chourasia, *Dr. H. S. Gour University, Sagar, India*
- 11:10 **D-74 Combined Rietveld Analysis of X-ray and Neutron Diffraction Data of Zinc Oxide Transparent Conductors**
G.B. González Avilés, R. Mansourian, B. Hardnacke, A. Wesolik, J. Gardner, *DePaul University, Chicago, IL*
J.S. Okasinski, *Argonne National Laboratory, Argonne, IL*
- 11:30 **D-62 Structural Analysis of Inhomogeneous SnO_x Thin Films**
I. Djerdj, D. Gracin, K. Juračić, D. Meljanac, *Rudjer Boskovic Institute, Zagreb, Croatia*
D. Balzar, *University of Denver, Denver, CO*

THURSDAY am XRF

Micro X-ray Analysis / Pikes Peak 1 & 2

Chair: **U.E.A. Fittschen**, *Universität Hamburg, Hamburg, Germany*

- 8:30 **F-77 Invited – Applications of Full Field Micro-XRF Analysis Using a Prototype X-ray Colour Camera**
L. Vincze, B. De Samber, K. De Schampelaere, C. Janssen, *Ghent University, Ghent, Belgium*
O. Scharf, A. Bjeoumikhov, N. Langhoff, *IfG-Institute for Scientific Instruments GmbH, Berlin, Germany*
R. Wedell, *Institut für Angewandte Photonik e.V. (IAP), Berlin, Germany*
H. Riesemeier, M. Radtke, *BAM Federal Institute for Materials Research and Testing, Berlin, Germany*

SPECIAL SESSIONS

- 9:00 **F-51 Invited – Decomposing Samples into Their Parts with Multivariate Statistics**
G. Wellenreuther, *DESY, Hamburg, Germany*
G. Silversmit, *Ghent University, Ghent, Belgium*
- 9:30 **F-11 Improved Quantification of Objects Imaged in 3D Using X-ray Micro-Tomography**
B.M. Patterson, C.E. Hamilton, E.K. Cerreta, J.P. Escobedo-Diaz, D. Dennis-Koller, *Los Alamos National Laboratory, Los Alamos, NM*
- 9:50 **F-5 Coupling X-ray Spectroscopy and Scanning Probe Microscopy for Simultaneous Sample Topography and Chemical Mapping**
M. Dehlinger, C. Fauquet, F. Jandard, D. Tonneau, *CNRS-CINaM, Marseille, France*
J. Purans, *University of Latvia, Latvia*
D. Pailharey, S. Ferrero, *Cie Axess Tech, Saint Cannat, France*
B. Dahmani, *Cie Loyalite, Besançon, France*
A. Bjeoumikhov, *IFG-GmbH, Berlin, Germany*
I. Zizak, A. Erko, *HZB-BESSY, Berlin, Germany*
- 10:10 **BREAK**
- 10:40 **F-7 Invited – 3D-XRF Analysis of Several Forensic and Industrial Samples**
K. Tsuji, C. Nishi, T. Nakazawa, K. Nakano, *Osaka City University, Osaka, Japan*
K. Otsuki, Y. Nishiwaki, *Forensic Science Laboratory, Hyogo, Japan*
H. Takenaka, *NTT-Advanced Technology, Atsugi, Japan*
- 11:10 **F-15 Investigation of Pathological Mechanisms in Brain Cancers with the Use of Techniques Based on Synchrotron Radiation**
M. Czyzycki, M. Szczerbowska-Boruchowska, A. Wandzilak, M. Czyzycki, K. Wolska, M. Lankosz, *AGH-University of Science and Technology, Krakow, Poland*
D. Adamek, E. Radwanska, *Jagiellonian University, Krakow, Poland*
- 11:30 **F-22 High Resolution X-ray (hiRX) Detection of Plutonium**
G. Havrilla, M. Collins, V. Montoya, *Los Alamos National Laboratory, Los Alamos, NM*
Z. Chen, F. Wei, M. Cusack, *X-ray Optical Systems, East Greenbush, NY*
- 11:50 **F-58 Investigation of Porcelain Cards Using Combined Spectroscopic Techniques**
A. Deneckere, B. Vekemans, L. de Vries, L. Van de Voorde, P. De Paepe, L. Vincze, L. Moens, P. Vandenabeele, *Ghent University, Ghent, Belgium*
- 12:10 **F-74 Fast X-ray Imaging “On-the-fly” with a Benchtop μ -XRF Instrument**
M. Haschke, U. Waldschläger, U. Rossek, R. Tagle, R. Erler, *Bruker Nano GmbH, Berlin, Germany*

THURSDAY am **XRF**

Past, Present and Future of Field-Portable XRF / Centennial

Chair: **S. Piorek**, *Thermo Fisher Scientific, Billerica, MA*

- 9:00 **F-71 Evolution of Handheld ED-XRF Analyzers and Their Impact on Quality of Our Lives**
S. Piorek, *Thermo Niton Analyzers, LLC, Billerica, MA*
- 9:20 **F-73 Invited – The Challenges in Designing, Optimizing, and Manufacturing X-ray Detectors for Hand-Held XRF**
J. Pantazis, A. Huber, T. Pantazis, R. Redus, *Amptek Inc, Bedford, MA*
- 9:50 **F-75 Invited – Miniature X-ray Sources: A Look Back at a Decade of Breakthrough Development and a Look Forward to Future Opportunities for the Portables Market**
M. Dinsmore, D.J. Caruso, *Thermo Niton Analyzers, LLC, Billerica, MA*
- 10:20 **BREAK**
- 10:50 **C-10 Evaluation of Portable XRF and XRD Analyzers for Identification of Counterfeit Pharmaceutical Products**
C.R. Bupp, H. Gregory, P.T. Palmer, *San Francisco State University, San Francisco, CA*
T. Jennison, *InXitu, Campbell, CA*
- 11:10 **F-32 Development of a Palm-Sized Electron Probe X-ray Analyzer**
S. Terada, S. Imashuku, J. Kawai, *Kyoto University, Kyoto, Japan*
- 11:30 **F-49 Ultra-Compact X-ray Source for Handheld and Portable XRF Applications**
D. Wang, S. Cornaby, D. Reynolds, J. Smith, C. Jensen, *Moxtek, Inc., Orem, UT*

SPECIAL SESSIONS / WEDNESDAY, THURSDAY & FRIDAY 3-5 AUGUST

THURSDAY pm XRD & XRF

Advances in Nanobeam Optics / Gold Camp

Chairs: **H. Yan**, Brookhaven National Laboratory, Upton, NY

L. Assoufid, Argonne National Laboratory - X-ray Science Division, Argonne, IL

- 1:40 **D-110 Invited – Breaking the 10NM Nanofocus Spot Size Barrier with New Approaches for Fresnel Zone Plates**
M. Feser, E. Snyder, Y. Feng, A. Lyon, S. Chen, Xradia Inc., Pleasanton, CA
- 2:10 **C-21 Invited – Multilayer Laue Lens Fabrication for X-ray Nanofocusing; Current Status and Future Perspectives**
R. Conley, N. Bouet, H. Yan, Y. S. Chu, NSLS-II, Brookhaven National Laboratory, Upton, NY
A.T. Macrander, J. Maser, R. Divan, G.B. Stephenson, B. Shi, C. Liu, L. Assoufid, Argonne National Laboratory, Argonne, IL
H. Kang, Chosun University, Gwangju, Republic of Korea
- 2:40 **C-5 Application of Capillary X-ray Optics in Imaging Techniques**
Z. Liu, Y. Li, X. Lin, P. Luo, Q. Pan, X. Ding, Z. Guo, Beijing Normal University, Beijing, China
T. Sun, Beijing Normal University, Beijing, China and State University of New York, Albany, NY
C. MacDonald, State University of New York, Albany, NY
G. Li, Q. Jia, D. Chen, Q. Yuan, W. Huang, P. Zhu, Q. Xu, Chinese Academy of Science, Beijing, China
X. Wei, Y. Huang, Chinese Academy of Science, Shanghai, China
- 3:00 **F-14 Characterization of Electrochemically Deposited Thermoelectric Films**
U.E.A. Fittschen, K. Reinsberg, M. Menzel, J.A.C. Broekaert, University of Hamburg, Hamburg, Germany
K. Appel, Deutsches Elektronen Synchrotron, Hamburg, Germany
- 3:20 **BREAK**
- 3:50 **C-27 Invited – Fabrication, Metrology and Performance of Profile-Coated K-B Mirrors for Hard X-ray Nanofocusing**
L. Assoufid, B. Shi, W. Liu, J. Qian, C. Liu, P. Zchack, R. Khachataryan, A.M. Khounsary, APS, Argonne National Laboratory, Argonne, IL
J. Tischler, G. Ice, Oak Ridge National Laboratory, Oak Ridge, TN
- 4:20 **F-23 Actinide Characterization Using Ultra High Energy X-ray Fluorescence**
G. Havrilla, M. Collins, V. Montoya, Los Alamos National Laboratory, Los Alamos, NM
Z. Chen, F. Wei, M. Cusack, X-ray Optical Systems, East Greenbush, NY
- 4:40 **D-77 Background and Boundary Corrections in Micro-XRD Phase Scanning**
C. Kong, Y. Wang, Analytical Centre, UNSW, Sydney, Australia
Q. X. Liu, ALS Mineral, Vancouver Branch, Canada

THURSDAY pm XRD

Stress Analysis / Pikes Peak 1 & 2

Chairs: **C. Goldsmith**, IBM, Hopewell Junction, NY

T. Watkins, Oak Ridge National Laboratory, Oak Ridge, TN

- 1:40 **D-80 Invited – Understanding Stress Gradients in Microelectronic Metallization**
C.E. Murray, IBM, T.J. Watson Research Center, Yorktown Heights, NY
- 2:10 **D-1 Invited – Algorithm and Strategy of Stress Analysis with 2D Detector**
B.B. He, Bruker AXS, Madison, WI
- 2:40 **D-46 Stresses in Ytterbium Silicate Multilayer Environmental Barrier Coatings**
F. Stolzenburg, B.J. Harder, J. Ramirez-Rico, K.T. Faber, Northwestern University, Evanston, IL
K.N. Lee, Rolls-Royce Corporation, Indianapolis, IN
J.D. Almer, Argonne National Laboratory, Argonne, IL
- 3:00 **BREAK**
- 3:30 **D-38 Invited – Residual Stresses in Aluminum Clad Uranium-10WT% Molybdenum Fuel Plates**
D.W. Brown, B. Clausen, Los Alamos National Laboratory, Los Alamos, NM
M.A. Okuniewski, Idaho National Laboratory, ID
- 4:00 **D-60 A Software Program for Calculating Diffraction Elastic Constants of Textured Materials**
T. Gnäupel-Herold, University of Maryland, Gaithersburg, MD
- 4:20 **D-61 An Investigation of the Accuracy of Diffraction Stress Evaluation of Textured Materials**
T. Gnäupel-Herold, A. Creuziger, M. Iadicola, University of Maryland, Gaithersburg, MD

SPECIAL SESSIONS

4:40 **D-92 Residual Stress Analysis of Copper-Indium-Gallium-Selenium/Molybdenum Thin Film on Stainless Steel Substrate**
Y. Shi, S. Rozeveld, *The Dow Chemical Company, Midland, MI*

THURSDAY pm XRD

Rietveld Analysis II / Pikes Peak 3 & 4

Chair: **P.H.J. Mercier**, *National Research Council of Canada, Ottawa, Ontario, Canada*

1:40 **D-76 Invited – Exploring Variation in the Crystal Structure of Kieserite, $\text{MgSO}_4 \cdot \text{H}_2\text{O}$, Using X-ray Powder Diffraction and Charge Flipping**
S.A. Wilson, D.L. Bish, H.-W. Wang, *Indiana University, Bloomington, IN*
R.E. Milliken, *University of Notre Dame, Notre Dame, IN*

2:10 **D-2 Invited –Rietveld Quantitative Phase Analysis of Mineralogical Materials**
M. Raudsepp, *University of British Columbia, Vancouver, BC, Canada*

2:40 **D-7 Absorption Edge Modeling In Line Profile Fitting Applications**
A. Kern, A. Coelho, K. Knorr, *Bruker AXS, Karlsruhe, Germany*

3:00 **BREAK**

3:30 **D-109 Composition-Dependent Negative Thermal Expansion in Tetracyanidoborate Materials**
J.J. Chadbourne, D.J. Price, C.J. Kepert, *University of Sydney, Australia*
V.K. Peterson, *The Bragg Institute, ANSTO, Australia*

3:50 **D-107 Order and Disorder in Layered Oxide Photocatalysts via X-ray and Neutron Powder Diffraction**
J. Shi, E. J. Nichols, S.T. Misture, *Alfred University, Alfred, NY*

4:10 **D-42 Use of the Rietveld Method for Describing Structure and Texture in X-ray Diffraction Data of Huntite [$\text{CaMg}_3(\text{CO}_3)_4$], Dolomite [$\text{CaMg}(\text{CO}_3)_2$] and Magnesite [MgCO_3] Powders**
H. Sitepu, *Saudi Aramco, Dhahran, Saudi Arabia*

THURSDAY pm XRF

Quantitative Analysis / Centennial

Chair: **W.T. Elam**, *University of Washington APL, Seattle, WA*

2:00 **F-3 Quantitative Characterization of Stratified Materials by Confocal 3D Micro-Beam X-ray Fluorescence Spectroscopy: Monte Carlo Simulation vs. Fundamental Parameters Model**
M. Czyzycki, D. Wegrzynek, P. Wrobel, M. Lankosz, *AGH University of Science and Technology, Krakow, Poland*

2:20 **F-4 Use of Monte Carlo Simulation Methods to Improve X-ray Detector Response Function**
F. Li, X. Han, *Baker Hughes, Houston, TX*
R. Gardner, *North Carolina State University, Raleigh, NC*

2:40 **F-43 Fundamental Parameter Determination for Improved XRF Quantification in the Soft X-ray Range**
M. Müller, B. Beckhoff, *Physikalisch-Technische Bundesanstalt, Berlin, Germany*
B. Kanngießer, *Technical University of Berlin, Berlin Germany*

3:00 **F-60 XRF Peak Deconvolution Using Peak Ratios Refined by Fundamental Parameters**
S. Terada, *X-Bridge Technologies Co., Ltd., Uji, Kyoto, Japan*
H. Yamashita, Y. Araki, *X-tec. Co., Ltd., Osaka, Osaka, Japan*

3:20 **BREAK**

3:40 **F-42 Trace Element Background Correction and Small Spot Analysis for Geological Samples with a New 4.2 KW XRF Spectrometer**
R.M. Conrey, *Washington State University, Pullman, WA*

4:00 **F-35 Determination of Doping Levels of Two-Dopant Phosphor Materials from X-ray Signal Intensity Ratios and Intensity Correction Analysis**
G. Darsey, *Cabot Superior MicroPowders, Albuquerque, NM*
R. Cone, *Thermo Fisher Scientific, Madison, WI*

4:20 **F-21 Standard Reference Material 2569 Lead in Paint for Consumer Products**
J.R. Sieber, J.L. Molloy, K.E. Murphy, S.E. Long, S.D. Leigh, *National Institute of Standards & Technology, Gaithersburg, MD*
D. Cobb, *U.S. Consumer Product Safety Commission, Gaithersburg, MD*

4:40 **F-78 Wavelength Dispersive XRF for Analysis of Small Amounts of Catalyst – How Small Can We Go?**
L.L. Brehm, D.W. Burns, S.O. Yusuf, T. Hasan, C.G. Simon, *The Dow Chemical Company, Midland, MI*

SPECIAL SESSIONS / WEDNESDAY, THURSDAY & FRIDAY 3-5 AUGUST

FRIDAY am XRD & XRF

Nanomaterials Characterization / Pikes Peak 1&2

Chairs: **A. Allen**, *National Institute of Standards & Technology, Gaithersburg, MD*
B. Palosz, *Institute of High Pressure Physics UNIPRESS Polish Academy of Sciences, Warsaw, Poland*
T. Proffen, *Oak Ridge National Laboratory, Oak Ridge, TN*

- 8:00 C-26 Invited –Diffractive Imaging of Individual Nanostructures
J. Min. Zuo, J. Zhang, K. Ran, *University of Illinois, Urbana, IL*
- 8:30 D-93 Invited – Pair Distribution Function Studies of Gold Nanoparticle Ensembles: The Challenge and Importance of Moving Beyond Ensemble Averaged Structural Descriptions
J.A. Kurzman, R. Seshadri, *University of California Santa Barbara, Santa Barbara, CA*
K. Page, *Los Alamos National Laboratory, Los Alamos, NM*
- 9:00 C-16 X-ray Fluorescence and Diffraction Mapping of Dentin at 200 NM
S.R. Stock, A.C. Deymier-Black, A. Veis, E. Lux, A. Telsner, *Northwestern University, Chicago, IL*
Z. Cai, *Argonne National Laboratory, Argonne, IL*
- 9:20 D-70 Core-Sheath Size of Nanoparticle Dispersions Studied by SAXS and Complementary Techniques
M.N. Martin, *NIST, Gaithersburg, MD and University of Maryland, College Park, MD*
A.J. Allen, R.I. MacCuspie, *NIST, Gaithersburg, MD*
- 9:40 BREAK
- 10:00 D-97 Invited – Structure and Dynamics at the Nanoscale Probed by X-ray Photon Correlation Spectroscopy
A.R. Sandy, S. Narayanan, M. Sikorski, *Argonne National Laboratory, Argonne, IL*
X. Lu, *Brookhaven National Laboratory, Upton, NY*
S.G.J. Mochrie, *Yale University, New Haven, CT*
- 10:30 D-14 Applications of Ultra-Small Angle X-ray Scattering in the Characterization of Nanomaterials
J. Ilavsky, *Argonne National Laboratory, Argonne, IL*
- 10:50 C-18 X-ray and Neutron Scattering Characterization of Nanomaterials to Address Measurement Challenges in Carbon Capture
A.J. Allen, M.L. Green, L. Espinal, W. Wong-Ng, *NIST, Gaithersburg, MD*
- 11:10 D-87 Characterization of Intercalant Nanoporous Materials with Atomic Pair Distribution Method
M.G. Shatnawi, *Hashemite University, Zarqa, Jordan*
S.J.L. Billinge, *Columbia University, New York, NY*
E.J. McKimmy, H. Kim, T.J. Pinnavaia, G. Paglia, J. Dye, K. Cram, *Michigan State University, East Lansing, MI*
M. Lefenfeld, *SiGNa Chemistry, New York, NY*
- 11:30 C-7 X-ray Measurements of Nanometer Thick Ta_xO_{1-x} on Silicon Substrates for Thickness and Composition Determination
F.J. Cadieu, I. Vander, Y. Rong, R.W. Zuneska, *Queens College of CUNY, Flushing, NY*

FRIDAY am XRD

Industrial Applications of XRD / Centennial

Chairs: **A. Payzant, T. Watkins**, *Oak Ridge National Laboratory, Oak Ridge, TN*

- 8:00 D-10 Investigation of the Structure of Aluminum and Gallium Doped Zinc Oxide Chemical Vapor Deposited Thin Films on Glass Using XRD and TEM
P. Ricou, R. Korotkov, L. Fang, *Arkema Inc, King of Prussia, PA*
- 8:20 D-20 Characterization of Structure Changes in Microporous Materials by In Situ X-ray Diffraction
R.W. Broach, *UOP LLC, Des Plaines, IL*
- 8:40 D-41 Electrolytic Phase Extraction: An Old Technique to Evaluate Precipitates in Nitinol
R.G. Baggerly, *The Boeing Co., Seattle, WA*
- 9:00 D-63 Micro X-ray Diffraction Orientation Analysis of Diamonds Used for Metal Roller Patterning
T. Blanton, C. Barnes, *Eastman Kodak Company, Rochester, NY*
- 9:20 BREAK
- 9:40 D-69 Applications for X-ray Microdiffraction
B. Jones, H. Cordes, M. Sunder, J. Giencke, B. He, *Bruker AXS Inc., Madison, WI*

SPECIAL SESSIONS

- 10:00 **D-71 Determining the Synergistic Effect of Organoclay and Carbon Black on the Morphology Structure, and Mechanical Properties of Epoxy-Polymer Using X-ray and AFM**
P. Nawani, L.S. Faraji, R.P. Singh, *Oklahoma State University, Tulsa, OK*
- 10:20 **D-21 Triads XRPD Indexing Algorithm and Its Use in Pharmaceutical Development**
R.B. McClurg, *SSCI, a Division of Aptuit, West Lafayette, IN*
- 10:40 **D-75 Rapid Triglyceride Polymorph Analysis Using a New Generation of 2D Benchtop pXRD**
T.C. Jennison, *InXitu Inc., Campbell, CA*
- 11:00 **D-79 Quantitative XRD Bulk and Clay Mineralogical Determination of Paleosol Section of Unayzah and Basal Khuff Clastics in Saudi Arabia**
S. Shen, S.R. Zaidi, B.A. Mutairi, A.A. Shehry, S.A. Hamoud, F.S. Khaldi, F.A. Edhaim, *Saudi Aramco, Dhahran, Saudi Arabia*

FRIDAY am XRF

Environmental and Handheld XRF / Pikes Peak 3 & 4

Chairs: **J.A. Anzelmo**, *Anzelmo & Associates, Inc., Madison, WI*
R. Van Grieken, *University of Antwerp, Antwerp, Belgium*

- 8:30 **F-38 Invited – Application of XRF to Monitoring Heavy Metals in Soils and Sediments**
S. Zhuo, A. Ji, *Chinese Academy of Sciences, Shanghai, China*
- 9:00 **F-27 Spectral Interferences of Sulfur on Light Elements in XRF Analysis of Particulate Matter Samples**
H. Indresand, A.M. Dillner, *University of California, Davis, CA*
M. Shen, *Zhejiang University, Hangzhou, P.R. China*
- 9:20 **F-59 Near Real Time Aerosol Metals Monitoring at $\mu\text{g}/\text{m}^3$ Concentrations Using Large Area Silicon Drift Detectors**
S. Barkan, V.D. Saveliev, M. Takahashi, L. Feng, C.R. Tull, E.V. Damron, *SII NanoTechnology USA Inc., Northridge, CA*
J.A. Cooper, K.A. Petterson, T.C. Pittenger, *Cooper Environmental Services LLC, Portland, OR*
- 9:40 **BREAK**
- 10:00 **F-79 Invited – The Excavations at Coriglia, Castel Viscardo, Italy: Use of Portable XRF for Phasing of Walls across Trenches**
D.B. George, L. Rulman, M.K. Donais, *Saint Anselm College, Manchester, NH*
- 10:30 **C-14 Evaluation of Hexavalent Chromium Extraction from Solids Using XANES and XRD**
J.R. Sieber, P.E. Stutzman, W.C. Davis, R.P. Watson, S.E. Long, *NIST, Gaithersburg, MD*
J. Mahlerbe, *Université de Pau et des Pays de l'Adour, Pau, France and NIST, Gaithersburg, MD*
M.P. Isaure, O.F.X. Donard, *Université de Pau et des Pays de l'Adour, Pau, France*
F. Séby, *Ultra Traces Analyses Aquitaine, Pau, France*
P. Rodriguez-Gonzalez, *Universidad Oviedo, Oviedo, Spain*
C. Maurizio, *European Synchrotron Radiation Facility, Grenoble, France*
N. Unceta, *University of the Basque Country, Vitoria-Gasteiz, Spain*
- 10:50 **F-83 Quantitative Analysis of Toxic Elements in Consumer Products and Environmental Samples by High Definition XRF**
Z.W. Chen, S. Song, D. Li, A. Vershinin, *XOS, East Greenbush, NY*
- 11:10 **F-86 HH XRF, From the Lab to the Field and Back! Using the Right Calibration for the Job at Hand**
A. Seyfarth, *Bruker AXS Inc., Madison, WI*
E. Nummi, M. Cameron, *Bruker Elemental, Kennewick, WA*

FRIDAY am XRF

Trace Analysis / Gold Camp

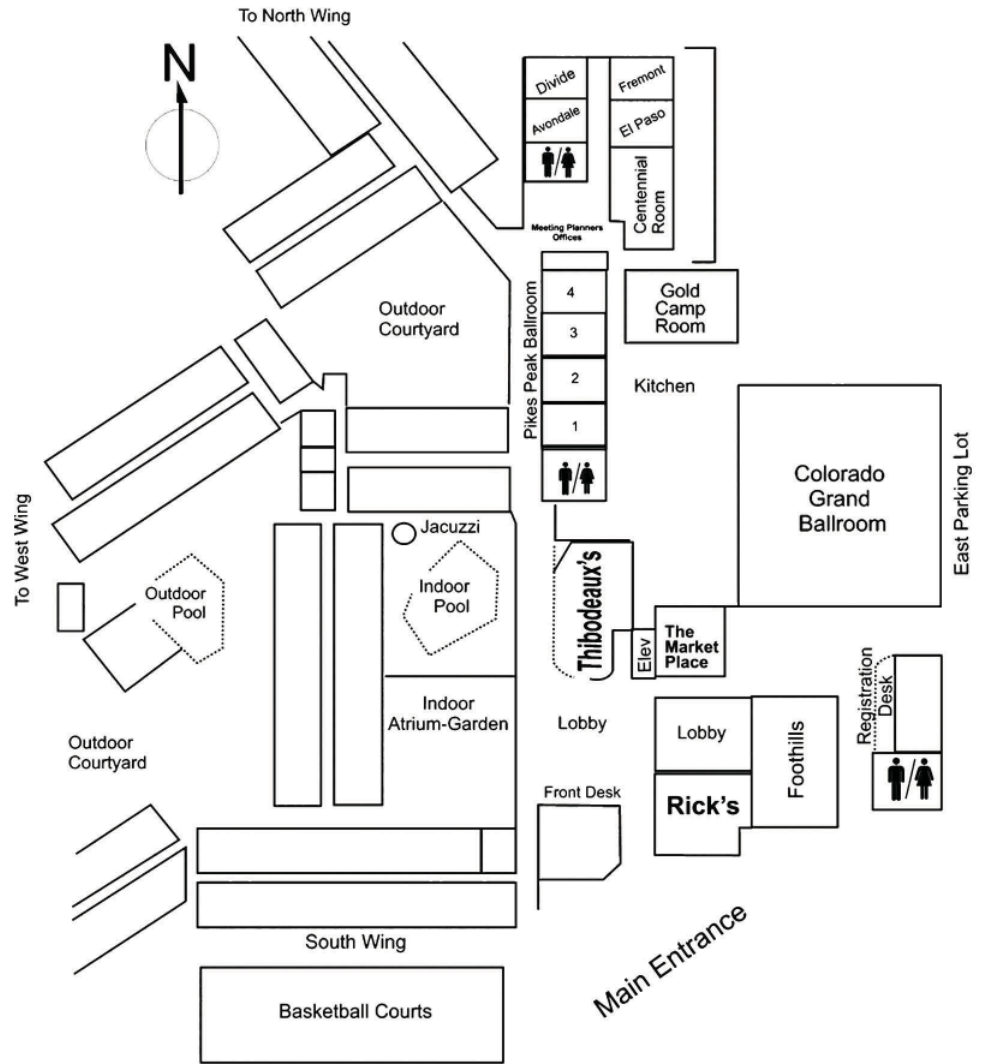
Chair: **G. Pepponi**, *Centre for Materials and Microsystems, Fondazione Bruno Kessler, Povo, Trento, Italy*

- 8:30 **F-81 Invited – Grazing Incidence X-ray Fluorescence Analysis in Shallow Dopant Distributions and Thin Films Characterisation**
G. Pepponi, F. Meirer, D. Giubertoni, M. Bersani, *CMM, Fondazione Bruno Kessler, Trento, Italy*
D. Ingerle, C. Strelj, *Technical University of Vienna, Vienna, Austria*
M.A. Sahiner, *Seton Hall University, South Orange, NJ*
M.A. Foad, *Applied Materials Inc., Santa Clara, CA*
J.C. Woicik, *NIST, Gaithersburg, MD*
A. Mehta, P. Pianetta, *SLAC National Accelerator Laboratory, Menlo Park, CA*
- 9:00 **F-84 Invited – Sample Preparation Strategies for Trace and Speciation Analysis by TXRF Spectrometry: Past, Present and Future**
E. Marguí, M. Hidalgo, *University of Girona, Girona, Spain*
I. Queralt, *Institute of Earth Sciences "Jaume Almera", CSIC, Barcelona, Spain*
C. Strelj, *Atominstutit TU Wien, Wien, Austria*

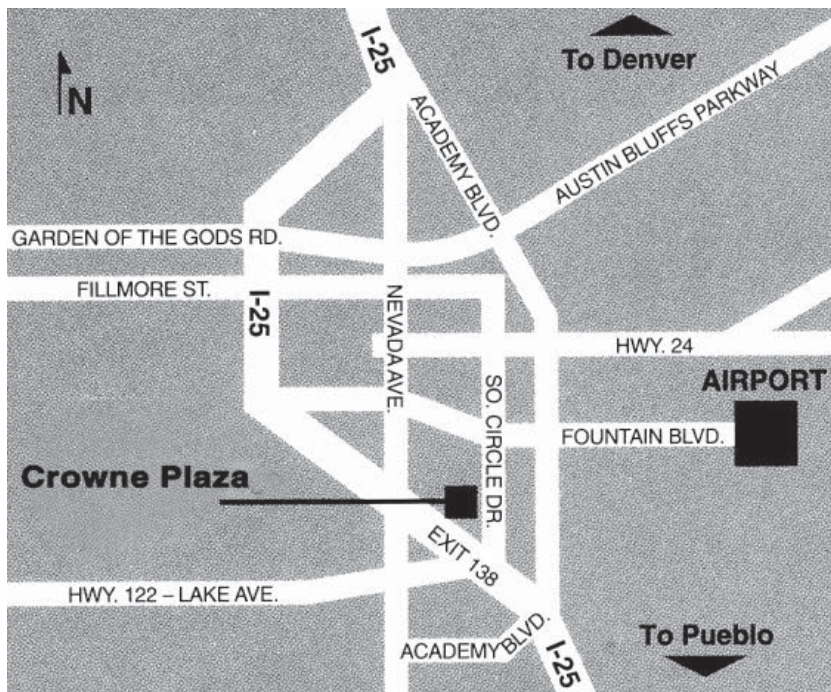
SPECIAL SESSIONS / WEDNESDAY, THURSDAY & FRIDAY 3-5 AUGUST

- 9:30 **F-40 Towards Accurate Analyses of Genesis Solar Wind Samples: Evaluation of Surface Cleaning Methods Using Total Reflection X-ray Fluorescence Spectrometry**
M. Schmeling, *Loyola University Chicago, Chicago, IL*
M. Humayun, *Florida State University, Tallahassee, FL*
A.J.G. Jurewicz, *Arizona State University, Tempe, AZ*
I.V. Veryovkin, *Argonne National Laboratory, Argonne, IL*
D.S. Burnett, *California Institute of Technology, Pasadena, CA*
- 9:50 **BREAK**
- 10:10 **F-56 Novel (Sub)-Nanometer XRF and TXRF Reference Samples**
M. Kraemer, R. Dietsch, T. Holz, D. Weissbach, *AXO DRESDEN GmbH, Dresden, Germany*
- 10:30 **F-33 Analytical Determination of Selenium in Medical Samples, Food, and Dietary Supplements by Means of Total Reflection X-ray Spectroscopy (TXRF)**
M. Beauchaine, *Bruker AXS Inc., Madison, WI*
H. Stosnach, *Bruker AXS Microanalysis GmbH, Berlin, Germany*
- 10:50 **F-61 Trace Analysis of Cadmium in Rice by the Selective Excitation of L Shell X-ray Fluorescence**
S. Hayakawa, Y. Sugihara, T. Hirokawa, H. Namatame, *Hiroshima University, Hiroshima, Japan*

FIRST FLOOR LAYOUT



DIRECTIONS TO THE CROWNE PLAZA HOTEL:



FROM WEST

Take Highway 24 East to I-25 South. On I-25 South, take Exit 138 (Circle Drive). Turn right at light. The hotel is on the left side of I-25 and clearly visible from the highway.

FROM NORTH

Take Interstate 25 South to Exit 138 (Circle Drive). The hotel is on east side of I-25 and clearly visible from the highway.

FROM SOUTH

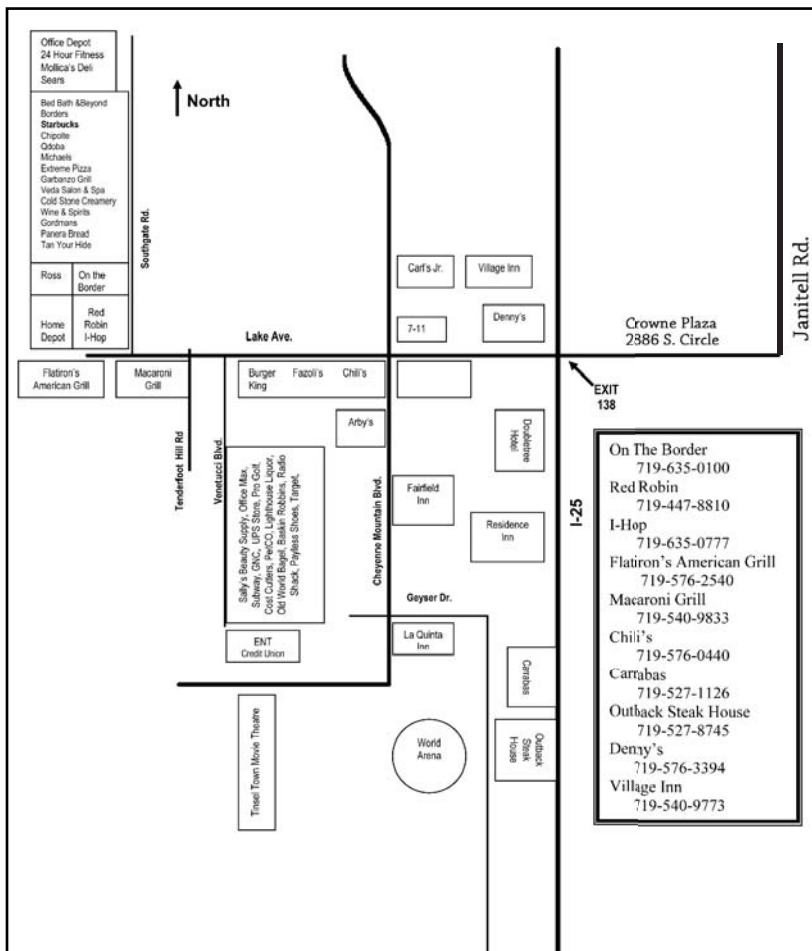
Take I-25 North to Exit 138 (Circle Drive). Turn right at the light. The hotel is on the right side of I-25 and clearly visible from the highway.

FROM COLORADO SPRINGS MUNICIPAL AIRPORT

Take Drennan for 2 miles. Turn right onto Hancock for 4 miles. Turn right onto South Circle Drive for 1 mile. The hotel is on the right side of South Circle Drive.

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MAP OF LOCAL AREA



Garden of the Gods 719.385.5940 West on Circle Blvd., right (North) on I-25 to exit Highway 24 West. Right (North) on 31st St., left (West) on Colorado Ave., right (North) on Beckers Lane to the Trading Post. **Approx 15 min.**

Seven Falls 719.632.0765 West on Circle Blvd., which turns into Lake Avenue. Continue on Lake until veering to the right at The Broadmoor. Left on Mesa Road. Follow signs for Seven Falls entrance. **Approx 15 min.**

Air Force Academy 719.333.7731 West on Circle Blvd., right (North) on I-25 to exit #156B left (West). Follow signs. **Approx 25 min.**

US Olympic Training Center 719.578.4618 West on Circle Blvd., right (North) on I-25 to exit Highway 24 East. Take new exit, Union Blvd., go left (North) to Boulder Street and turn left. Entrance is on the right. **Approx 10 min.**

Pikes Peak (Gray Line Tours) 719.633.1181 Use directions (below) to North Pole. \$10.00 each or \$35.00/car. Under age 16 – free. **Approx 30 min.**

Peterson AFB 719.556.7321 West on Circle Blvd., right (North) on I-25 to exit Highway 24 East, which turns into Fountain Blvd. Take to Powers Blvd., left (North) to Platte Ave. exit (Hwy 24). Right (East) to Peterson Road, right (South) to gate. **Approx 20 min.**

Cave of the Winds 719.685.5444 West on Circle Blvd., right (North) on I-25 to exit Highway 24 West. Pass over the Town of Manitou and take Cave of the Winds exit on right. **Approx 20 min.**

Royal Gorge Bridge 719.275.7507 or 888.333.5597 West on Circle Blvd., which turns into Lake Avenue. Left (South) on Highway 115 (Nevada Avenue), right (West) on Highway 50. Continue through Canon City. Follow signs. **Approx 1 hour.**

- On The Border
719-635-0100
- Red Robin
719-447-8810
- I-Hop
719-635-0777
- Flatiron's American Grill
719-576-2540
- Macaroni Grill
719-540-9833
- Chili's
719-576-0440
- Carrabas
719-527-1126
- Outback Steak House
719-527-8745
- Denzy's
719-576-3394
- Village Inn
719-540-9773

North Pole and Santa's Workshop 719.684.9432 West on Circle Blvd., right (North) on I-25 to exit Highway 24 West. Continue on Hwy 24 into foothills. Watch for Pikes Peak Tollway sign – exit on left (just after overhead bridge). Follow signs. **Approx 30 min.**

Cheyenne Mountain Zoo 719.633.9925 West on Circle Blvd., which turns into Lake Avenue. Continue on Lake until veering to right at The Broadmoor. Take left onto Cresta Road. Follow signs. **Approx 12 min.**

Cripple Creek 877.858.GOLD (4653) West on Circle Blvd., right (North) on I-25 to exit Highway 24 West. Continue on Hwy 24 to Town of Divide, left at Cripple Creek/Victor sign. **Approx 1 1/2 hours.**

Cog Railway 719.685.5401 West on Circle Blvd., right (North) on I-25 to exit Highway 24 West. Take Manitou exit, go West through the Town of Manitou then left on Ruxton Ave. to Cog Depot. **Approx 20 min.**

Manitou Cliff Dwellings 719.685.5242 or 800.354.9971 West on Circle Blvd., right (North) on I-25 to exit Highway 24 West exit. Pass over the Town of Manitou and take Cliff Dwellings exit on right. **Approx 20 min.**

Pro Rodeo Hall of Fame and American Cowboy Museum 719.528.4764 West on Circle Blvd., right (North) on I-25 to exit #147 (Rockrimmon). Left on Pro Rodeo Dr. **Approx 15 min.**

Flying W Ranch 800.232.FLYW (3599) West on Circle Blvd., right (North) on I-25 to exit #146 (Garden of the Gods Road) West until it ends. Right (North) on 30th street, next left (only way) on Flying W Ranch Road, left on Chuckwagon to parking lot. **Approx 25 min.**

Miramont Castle 719.685.1011 West on Circle Blvd., right (North) on I-25 to exit Highway 24 West. Take Manitou exit, go West through the Town of Manitou then left on Ruxton Ave. Visible from Ruxton – turn right on Capitol. **Approx 20 min.**

Shopping Manitou Springs, Old Colorado City, Downtown Colorado Springs, Citadel Mall and Chapel Hills Mall.

PROGRAM-AT-A-GLANCE

Monday Morning Workshops 9:00 am – 12:00 Noon				
Meeting Room				
	Pikes Peak 1 & 2	Pikes Peak 3 & 4	Gold Camp	Centennial
XRD	Specimen Preparation XRD (Fawcett)	Two-Dimensional Detectors (Blanton/He)		X-ray Metrology (Cline/Windover/Gil)
XRF			Basic XRF (Elam)	
Monday Afternoon Workshops 1:30 pm – 4:30 pm				
XRD & XRF				X-ray Optics (Havrilla)
XRD	Rietveld Analysis (Misture/Kaduk)		Mat. Char. by Combining X-ray Analytical w/3D X-ray Imaging Tech (Cernatescu)	
XRF		Trace Analysis (Streli/Wobrauschek)		
Monday Evening XRD Poster Session & Reception 5:00 – 7:00 pm Sponsored by PANalytical and ICDD; Summit Ballroom 4 th floor of the hotel				
Tuesday Morning Workshops 9:00 am – 12:00 Noon				
XRD & XRF	Technical Communication (Rosenstein)	Nanostructure by Atomic PDF Analysis I (Petkov)		
XRF			Fundamentals of Digital Signal Processing & X-ray Detectors (Hayakawa)	Quantitative Analysis I (Mantler)
Tuesday Afternoon Workshops 1:30 pm – 4:30 pm.				
XRD & XRF		Nanostructure by Atomic PDF Analysis II (Petkov)		
XRD	In-situ High Temp XRD (Payzant)			
XRF			Sampling Theory, Practice & Quality Control (Anzelmo/Zaitz)	Quantitative Analysis II (Mantler)
Tuesday Evening XRF and Core Shell Spectroscopy Poster Session & Reception 5:00 – 7:00 pm Sponsored by Chemplex; Summit Ballroom 4 th floor of the hotel				
Wednesday Morning Plenary Session 8:30 am – 12:30 pm. Foods & Drugs (Fawcett/Zaitz) Summit Ballroom 4 th floor of the hotel				
Wednesday Afternoon Sessions				
XRD & XRF		Energy Storage & Harvesting (Rodriguez) 1:30-4:50		New Devel. in XRD/XRF Instrumentation (Fawcett) 1:00-6:00
XRD	Line Profile Analysis (Leoni/Balzar) 2:00-5:00			
XRF			Fusion & Industrial Apps of XRF (Anzelmo) 1:30-5:00	CORE SHELL SPECTROSCOPY SPECIALIZED SESSION (Segre) Being held in the El Paso room. 2:00-4:30
Wednesday Evening 60 th Anniversary Party in the Exhibit Hall 5:00 – 7:00 pm Sponsored by ICDD				
Thursday Morning Sessions				
XRD & XRF			X-ray Imaging (Schuster/de Carlo) 8:30-12:40	
XRD		Rietveld Analysis I (Mercier) 9:00-11:50		
XRF	Micro X-ray Analysis (Fittschen) 8:30-12:30			Past, Present & Future of Field-Portable XRF (Piorek) 9:00-11:50
Thursday Afternoon Sessions				
XRD & XRF			Advances in Nanobeam Optics (Yan/Assoufid) 1:40-5:00	
XRD	Stress Analysis (Goldsmith/Watkins) 1:40-5:00	Rietveld Analysis II (Mercier) 1:40-4:30		
XRF				Quantitative Analysis (Elam) 2:00-5:00
Thursday Evening – Off Site Event. 5:45- 10:00 pm Please monitor the web site for upcoming details.				
Friday Morning Sessions				
XRD & XRF	Nanomaterials Characterization (Allen/Palosz/Proffen) 8:00-11:50			
XRD				Industrial Apps of XRD (Payzant/Watkins) 8:00-11:20
XRF		Environmental & Handheld XRF (Anzelmo/Van Grieken) 8:30-11:30	Trace Analysis (Pepponi) 8:30-11:10	