59th Annual Conference on Applications of X-ray Analysis

DENVER X-RAY CONFERENCE

2–6 August 2010

Denver Marriott Tech Center Hotel, Denver, Colorado, U.S.A.

CALL FOR PAPERS

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PLENARY SESSION:

"The Greening of X-rays: X-rays and Renewable Energy"

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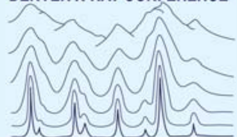

Sponsored by

XRD & XRF

The exact date and time of each workshop will not be determined until April 2010.

EXAFS

Organizers:

C. Segre, *Illinois Institute of Technology, Chicago, IL, segre@iit.edu*

M. Newville, *University of Chicago/Argonne National Laboratory, Argonne, IL, newville@cars.uchicago.edu*

B. Ravel, *National Institute of Standards & Technology, Gaithersburg, MD, bruce.ravel@nist.gov*

Description to be announced.

CULTURAL HERITAGE — FULL DAY

Organizers *& Instructors:*

M. Walton, *Getty Conservation Institute, Los Angeles, CA, mwalton@getty.edu*
K. Eremin, *Harvard Art Museum, Cambridge, MA, katherine_eremin@harvard.edu*
A. Bezur, *The Museum of Fine Arts, Houston Conservation, Houston, TX*
A. Drews, *Ford Research & Advanced Engineering, Ford Motor Company, Dearborn, MI*
J. Dik, *Delft University of Technology, Delft, The Netherlands*
K. Trentelman, *Getty Conservation Institute, Los Angeles, CA*

This workshop will be focused on the use of XRF and XRD to analyze works of art. The instructors will discuss both the general use of these techniques and their limitations, as well as the specialized issues surrounding the use of this instrumentation on works of art. An emphasis will be placed this year on the characterization of ceramics, glazes, and glasses which often contain difficult to analyze light elements. Discussions will therefore be centered on the optimization of portable XRF instruments for the analysis of these materials.

XRD

TRACE PHASE IDENTIFICATION USING CHEMICAL INFORMATION

Organizers:

T. Fawcett, *International Centre for Diffraction Data, Newtown Square, PA, fawcett@icdd.com*
J. Kaduk, *Poly Crystallography Inc., Naperville, IL, kaduk@polycrystallography.com*

We have all been challenged at some point in trying to identify important materials in complex mixtures based on a minimum (1-2 lines) amount of diffraction data. Often, even the best batch processed phase identification software has difficulty with minor and trace phase identification (1-10 weight %), simply due to a lack of statistical significance in the data. However, most of the time, the analyst knows some information about the specimen that is not reflected in the XRD data. The analyst may know the sample history, type of sample, and some knowledge of the chemistry, physical properties or observational behavior (i.e., hardness, bubbles with acid). Tools such as relational databases, LeBail refinement, pattern simulations, and Rietveld refinements can be used to search and find information about a sample that provides significance when coupled with just a few observations in the diffraction data. This workshop will use actual examples, demonstrating both the tools and processes for successfully identifying the needles in a haystack. We will focus on the methods and tools used after the bulk phases have been identified which will enable the analyst to identify the minor and trace components. The tools and processes can help a good analyst become a great analyst!

TEXTURE ANALYSIS — FULL DAY

Organizer *& Instructors:*

H. Schaeben, *Freiberg University of Mining & Technology, Freiberg, Saxony, Germany, schaeben@geo.tu-freiberg.de*
C. Lavoie, *IBM Research, T.J. Watson Research Center, Yorktown Heights, NY*
R. Hielscher, *Helmholtz Zentrum München; GSF - Forschungszentrum für Umwelt und Gesundheit, Neuherberg, Germany*
F. Bachmann, *Technische Universität Bergakademie Freiberg, Freiberg, Germany*

Texture analysis is a method to quantify the pattern of crystallographic preferred orientation in polycrystalline materials like metals, rocks or ceramics. The course will cover:

1. A brief introduction into the basic mathematics of practical texture analysis from the point of view of Radon transforms and computer tomography.
2. An extensive introduction into the free and open source MATLAB® toolbox MTEX (http://code.google.com/p/mtex/) to compute an orientation density function (odf) from experimental pole intensity data, e.g., area detector data, and its characteristic properties as harmonic coefficients, texture index, mode, volume portions, etc.

Attendees are asked to bring their own laptop, if possible equipped with a recent MATLAB® license to do hands-on exercises by themselves.

POLYMERS

Organizers *& Instructors:*

S. Murthy, *Rutgers University, Piscataway, NJ, murthy@biology.rutgers.edu*
B. Landes, *Dow Chemical Company, Midland, MI, bglandes@dow.com*
C. Burger, *SUNY – Stony Brook, Stony Brook, NY*
J. Ilavsky, *Advance Photon Source/Argonne National Laboratory, Argonne, IL*
G. Beaucage, *University of Cincinnati, Cincinnati, OH*
B. Lee, *Advance Photon Source/Argonne National Laboratory, Argonne, IL*

Small-angle X-ray scattering (SAXS) is a well established technique in many areas (biology, materials science, metallurgy, polymer and colloid physics) for analyzing structures at the colloidal length scale (10-100's nm). It is a powerful metrology technology that can be used to describe the size, size distribution, shape, density, volume fraction, order/disorder, and interfaces of moieties in multiphase systems. The workshop will discuss SAXS theory, instrumentation, data analysis / interpretation, and structural modeling. The presenters will discuss examples from the field of polymers, ceramics, biological systems, and particulate materials. Software packages that can be used in the analysis of the data and specific analysis methods will be described. A relatively new technique for the analysis of long-range structure near surfaces, grazing incidence SAXS (GISAXS) will be discussed. Each of the lectures will cover specific means of data collection, the models used to interpret the data, and the techniques for analyzing the data to get meaningful information. Specific topics that are of broad interest and falling within the scope can be submitted in advance for consideration to murthy@biology.rutgers.edu.

SURVEY OF BASIC XRD APPLICATIONS

Organizer *& Instructors:*

S.T. Misture, *NYS College of Ceramics at Alfred University, Alfred, NY, misture@alfred.edu*
T.N. Blanton, *Eastman Kodak Company Research Labs, Rochester, NY*
M.A. Rodriguez, *Sandia National Laboratories, Albuquerque, NM*

This ½ day workshop will survey various applications of XRD analysis, including in situ analyses and neutron diffraction. The analyses will include phase ID, crystallite size and microstrain, preferred orientation and texture, lattice parameters and solid solutions, and residual stress. Brief overviews of high-temperature in situ analysis, neutron diffraction and synchrotron studies will be included.

TWO-DIMENSIONAL DETECTORS

Organizers *& Instructors:*

T.N. Blanton, *Eastman Kodak Company Research Labs, Rochester, NY, thomas.blanton@kodak.com*
B.B. He, *Bruker AXS Inc., Madison, WI, bob.he@bruker-axs.com*
P. Salficky, *DECTRIS Ltd., Baden, Switzerland*
M. Fransen, *PANalytical B.V., Almelo, The Netherlands*
J. Ferrara, *Rigaku Americas Corporation, The Woodlands, TX*

Two-dimensional diffraction data contains 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 dif-

fraction in terms of detector technology, geometry and configuration of the two-dimensional diffractometer. Various applications, such as phase ID, texture, stress, crystallinity, combinatorial screening, and thin film analysis will be discussed.

PAIR DISTRIBUTION FUNCTION

Organizer:

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

This workshop will provide a brief refresher on the PDF's fundamentals and hands-on training on experimental XRD data, both in-house and synchrotron, reduction into PDFs as well as fitting of structure models to experimental PDFs. Attendees are encouraged to bring laptops and data sets of their own.

XRF

BASIC XRF

Organizer *& Instructors:*

W.T. Elam, *Ametek/EDAX Research Group and University of Washington APL, Seattle, WA, wtelam@apl.washington.edu*

G. 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.

TRACE ANALYSIS

Organizer *& Instructors:*

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

Instructors and description to be announced

XRF SPECIMEN PREPARATION

Organizer *& Instructors:*

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

M. Loubser, *PCC Cement, Johannesburg, South Africa*

L. Ottmar, *Millennium Inorganic Chemicals, A Cristal Company, Glen Burnie, MD*

This workshop will cover the basics of XRF sample preparation including sampling techniques and equipment needed, preparation of powder briquettes and fusion beads, and the techniques and equipment used for manual and automated methods. Fusion techniques will include both borate and peroxide methods. Materials to be covered include geological, mining, cement and associated materials (Loubser), and products and raw materials used in the titanium oxide industry (Ottmar).

QUANTITATIVE ANALYSIS — FULL DAY

Organizer *& Instructors:*

M. Mantler, *Purkersdorf, Austria, michaelmantler@aon.at*

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

W.T. Elam, *Ametek/EDAX Research Group and 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.

Afternoon: Advanced methods of quantitative analysis:

1. Interpretation of spectra and full spectrum modeling.
2. Coherent and incoherent scattering.
3. Analysis of thin films/layers.

STANDARDS AND ADVANCED SAMPLE PREPARATION FOR XRF ANALYSIS

Organizer *& Instructors:*

K. Tsuji, *Osaka City University, Osaka, Japan, tsuji@a-chem.eng.osaka-cu.ac.jp*
K. Nakano, *Osaka City University, Osaka, Japan*
U. Fittschen, *University of Hamburg, Hamburg, Germany*
B. Beckhoff, *Physikalisch-Technische Bundesanstalt, Berlin, Germany*

This workshop will introduce standard materials for quantitative XRF analysis of trace or major elements in metals, plastics, soils, and other matrices. The emphasis will be on understanding how to prepare the calibration standards as well as reference-free XRF analysis. A demonstration, on how to evaluate analytical performance of micro-XRF by using micro structured materials, will be provided. Additionally, the workshop will include a discussion on sample preparation using pico-droplets and pre concentration techniques, which are useful for trace analysis techniques such as TXRF.

SESSIONS WEDNESDAY, THURSDAY & FRIDAY, 4–6 AUGUST

The exact date and time of each session will not be determined until April 2010. The conference ends at 12 NOON on Friday, 6 August.

PLENARY SESSION:

The Greening of X-rays: X-rays and Renewable Energy

Chairs: **R.L. Snyder,** *Georgia Institute of Technology, Atlanta, GA, bob.snyder@mse.gatech.edu*
B. Toby, *APS, Argonne National Laboratory, Argonne, IL, brian.toby@anl.gov*

Investigations of the Defect Structure of Transparent Conductors Using X-ray and Neutron Scattering Techniques

Gabriela B. González Avilés, *DePaul University, Department of Physics, Chicago, IL*

In-situ Diffraction: An Important Tool for the Development of Renewable Energy Technologies

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

Unraveling the Inner Workings of Energy-related Materials Using In-situ X-ray Absorption Techniques

Faisal Alamgir, *Georgia Institute of Technology, Materials Science & Engineering, Atlanta, GA*

Insights into Thermoelectric Materials: New Structures and Properties

Paul Zschack, *Advanced Photon Source, Argonne National Laboratory, Argonne, IL*

XRD AND XRF

NEW DEVELOPMENTS IN XRD & XRF INSTRUMENTATION

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

Abstracts should be submitted by technical representatives of a manufacturer. They should discuss specifications, and applications concerning one of their newest and most important products. Talks should include comments about software, XRD and XRF equipment, and accessories. No mention of prices or a comparison with competitors' products can be included.

CULTURAL HERITAGE — FULL DAY

Chairs: **M. Walton,** *Getty Conservation Institute, Los Angeles, CA, mwalton@getty.edu*
K. Eremin, *Harvard Art Museum, Cambridge, MA, katherine_eremin@harvard.edu*

Confocal XRF and Its Application to Ceramics
J. Mass, *Winterthur Museum and Country Estate, Winterthur, DE*

Synchrotron XRF Analysis of Works of Art
A. Mehta, *Stanford Synchrotron Radiation Lightsource (SSRL), Menlo Park, CA*

Analysis of Meissen Porcelain Glazes and Bodies
A. Shortland, *Cranfield University, Shrivenham, UK*

PROBING CATALYSTS WITH X-RAY ABSORPTION SPECTROSCOPY

Chairs: **C. Segre,** *Illinois Institute of Technology, Chicago, IL, segre@iit.edu*
M. Newville, *Univ. of Chicago/Argonne National Lab, Argonne, IL, newville@cars.uchicago.edu*
B. Ravel, *NIST, Gaithersburg, MD, bruce.ravel@nist.gov*

Invited speakers to be announced

XRD

STRESS ANALYSIS

Chairs: **C. Goldsmith,** *IBM, Hopewell Junction, NY, cgoldsmi@us.ibm.com*
T. Watkins, *Oak Ridge National Laboratory, Oak Ridge, TN, watkinstr@ornl.gov*

Commissioning Results and New Scientific Opportunities at Vulcan – The SNS Materials Science and Engineering Diffractometer
K. An, *Oak Ridge National Laboratory, Oak Ridge, TN*

Thermo-mechanical Behavior of Thin Films and Small Structures Characterized by X-ray Diffraction
J. Keckes, *University of Leoben, Leoben, Austria*

Title to be announced
R. Rogge, *Steacie Institute for Molecular Science, Chalk River Laboratories, Chalk River, Ontario, Canada*

POLYMERS/SAX — FULL DAY

Chairs: **S. Murthy,** *Rutgers University, Piscataway, NJ, murthy@biology.rutgers.edu*
B. Landes, *Dow Chemical Company, Midland, MI, bglandes@dow.com*

Disorder in a Fiber: RDF Analysis on an Oriented System
D. Londono, *DuPont Company, Wilmington, DE*

Transient Microstructure of Thermoplastic Polyurethane Nanocomposites Under Uniaxial Deformation
H. Koerner, *Nanostructured and Biological Materials Branch, Air Force Research Labs, Wright-Patterson AFB, OH*

In-situ and Time Resolved SAXS
B. Landes, *Dow Chemical Company, Midland, MI*

Analysis of 2D SAXS Patterns from Oriented Systems
S. Murthy, *Rutgers University, Piscataway, NJ*

MICRO DIFFRACTION

Chair: **C. Murray,** *IBM, T.J. Watson Research Center, Yorktown Heights, NY, conal@us.ibm.com*

Nanoscale Scanning Probe Diffraction Microscopy at the CNM/APS Hard X-ray Nanoprobe Beamline

M.V. Holt, *Advanced Photon Source, Argonne National Laboratory, Argonne, IL*

Three Dimensional X-ray Diffraction Microscopy

L. Margulies, *National Synchrotron Light Source 2, Brookhaven National Laboratory, Upton, NY*

RIETVELD ANALYSIS

Chairs: **J. Kaduk,** *Poly Crystallography Inc., Naperville, IL, kaduk@polycrystallography.com*
S.T. Misture, *NYS College of Ceramics at Alfred University, Alfred, NY, misture@alfred.edu*

High-resolution Powder X-ray Diffraction Study of Complex Minerals

S. Antao, *University of Calgary, Calgary, Alberta, Canada*

MILE HIGH RESOLUTION XRD

Chair: **K. Evans-Lutterodt,** *Brookhaven National Laboratory, Upton, NY, kenne@bnl.gov*

Invited speakers to be announced

XRF

FUSION AND INDUSTRIAL APPLICATIONS OF XRF

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

Applications of XRF in CRM Development at the National Institute of Standards and Technology

J. Sieber, *National Institute of Standards and Technology, Gaithersburg, MD*

XRF Applications in the Titanium Oxide Industry

L. Ottmar, *Millennium Inorganic Chemicals, A Cristal Company, Glen Burnie, MD*

ENVIRONMENTAL AND HANDHELD XRF

Chairs: **J.A. Anzelmo,** *Anzelmo & Associates, Inc., Madison, WI, jaanzelmo@aol.com*
R. Van Grieken, *University of Antwerp, Antwerp, Belgium, rene.vangrieken@ua.ac.be*

Title to be announced

A. Karydas, *International Atomic Energy Agency, Vienna, Austria*

TRACE ANALYSIS

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

Invited speakers to be announced

X-RAY IMAGING

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

X-ray Chemical Imaging in Scanning and Projection Modes in the Laboratory

K. Tsuji, *Graduate School of Engineering, Osaka City University, Osaka, Japan*

Imaging of High-Intensity Discharges with Applications to Energy-Efficient Lighting

J. Curry, *National Institute of Standards and Technology, Gaithersburg, MD*

QUANTITATIVE ANALYSIS

Chair: **W.T. Elam,** *Ametek/EDAX Research Group and Univ. of Washington APL, Seattle, WA, wtelam@apl.washington.edu*

Analytical Strategy for Compositional and Layer Thickness Analysis of Copper-Indium-Gallium-Selenium on Molybdenum Coated Glass Substrates

L. Brehm, *Dow Chemical Company, Midland, MI*

CONTRIBUTED ABSTRACTS

Abstracts are hereby solicited for oral presentation in any of the special sessions listed, or the XRD and XRF poster sessions. Not all contributed abstracts submitted for oral presentation will be placed in a special session, but may instead be placed in a poster session. Poster sessions will be held on Monday and Tuesday evening of conference week, in conjunction with the evening receptions. The Organizing Committee considers the withdrawal of an abstract after it has been accepted and advertised as highly nonprofessional (except in special circumstances). Please try to secure travel funding and approvals before submitting your abstract.

DEADLINE FOR SUBMISSION OF ABSTRACTS **15 February 2010**

GUIDELINES FOR PREPARING ABSTRACTS

GUIDELINES FOR PREPARING ABSTRACTS

Abstracts are reproduced in the *Book of Abstracts*, and will also be published on the Denver X-ray Conference website, with links to, or duplicate copies on other affiliated websites (e.g., ICDD). Abstracts must be prepared according to the following guidelines:

- **File format:** Abstract should be created in either Adobe® PDF or in Microsoft® Word (Word 97 – Word 2007). The abstract must include the title, author(s), affiliations(s) and text.
- **Size:** The abstract should not exceed one page in length (8.5” x 11” page size); with a one-inch margin all around. This includes any figures or graphs (please keep to a minimum).
- **Font:** Times or Times New Roman, 12 point.
- **Title:** Bold, Center, Uppercase (excluding subscripts, superscripts, elements and compound abbreviations).
- **Author(s) and Affiliation(s):** Center directly under Title. Leave one blank line after the author(s) and affiliation(s) before beginning text of abstract.
- **Text:** Paragraphs should be flush left (do not indent); single-spaced; leave one blank line between paragraphs, space permitting.
- **Characters, tables, formulae, figures, symbols, graphics:** All must be embedded into your text. Please keep to a minimum, and limit the fonts to those that are available with the standard distribution of Microsoft® Word. Nonstandard fonts will lead to errors in transmission.

ONLINE ABSTRACT SUBMISSION

Please visit the DXC website: **www.dxcicdd.com** and follow the instructions for online abstract submission. Abstracts may only be received through the online submission process. You will be required to fill out a general information form, and then given a choice to either upload your abstract directly from your computer as an Adobe® PDF or e-mail your abstract as an attachment created in Microsoft® Word (Word 97 – Word 2007).

CONFIRMATION OF ABSTRACT SUBMISSION

When submitting your abstract online, you should receive two automated e-mail confirmations – one message confirming that your general information was received, and a second confirming that your abstract file was received. If you choose to e-mail your abstract as a Microsoft® Word document, then confirmation of your abstract may take up to one week. If you do not receive confirmation within one week of your submittal, please contact Denise Flaherty: flaherty@icdd.com; 610.325.9814.

CONFERENCE INFORMATION

HOST HOTEL

The 2010 Denver X-ray Conference will be held at the Denver Marriott Tech Center Hotel, 4900 S. Syracuse Street, Denver, CO 80237, U.S.A., phone: 1.800.228.9290, or dial direct: 1.303.779.1100, fax: 1.303.740.2523, website:
www.marriott.com/property/property page/DENTC.

HOTEL RESERVATIONS

The special conference rate of $139 per night (plus tax) is applicable until Friday, 16 July 2010, subject to availability. Please do not wait to book your reservation – there are a limited number of rooms available at the special conference rate! Attendees are responsible for making their own reservations. Please call 1(800)228.9290 and identify yourself as a Denver X-ray Conference attendee when booking your reservation. The website for online reservations is: **https://resweb.passkey.com/Resweb.do?mode=welcome_ei_new&eventID=1454471**. All reservations must be accompanied by a first night room deposit, or guaranteed with a major credit card.

STUDENT ROOMS

There are a limited number of hotel rooms being offered to students at a discounted rate of $70 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 website: **www.dxcicdd.com** for a Student Room Authorization form. Student identification will be required. Rooms will be booked on a first-come first-serve basis.

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.

EXHIBITS

Vendors – don't miss this opportunity to display your company's products and services to this elite crowd of scientists. The cost for an 8"x10" booth will be $1,950.00 and will include a vendor sponsored wine & cheese reception on Wednesday evening of conference week and wireless internet in the exhibit hall. Applications for exhibit space will be available on 1 February 2010. Contact Denise Flaherty: flaherty@icdd.com, 610-325-9814, to add your name to the mailing list.

SPONSORSHIP OPPORTUNITIES

There are various sponsorships available to exhibitors of the Denver X-ray Conference. This information will be released on 1 February 2010 along with the application for exhibit space. Please visit our website: **www.dxcicdd.com** for details or contact Denise Flaherty: flaherty@icdd.com, 610.325.9814.

Have an idea for a workshop or session?

Visit: **www.dxcicdd.com/workshopsuggestions.htm**

CONFERENCE PROCEEDINGS – DXC

Don't miss this opportunity to showcase your research by submitting your presented paper for the DXC conference proceedings, *Advances in X-ray Analysis*, Volume 54 on CD-ROM. 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 2010.

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

Advances in X-ray Analysis is distributed throughout the world, and the complete manuscripts of volumes 40 – 50 (1996 – 2006) can also be viewed on the ICDD website:
www.dxcicdd.com/advances/advances.htm.

Jerome B. Cohen Student Award

Deadline Date for submission: **1 July 2010**

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, may 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 2010 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 oral or 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 on: **www.dxcicdd.com/09/details.htm#cohen**.
- Please follow the same format guidelines as manuscripts submitted for the conference proceedings, *Advances in X-ray Analysis*. This information can also be found on **www.dxcicdd.com/09/details.htm#cohen**. 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, available on: **www.dxcicdd.com/advances/authors.htm**.
- Papers must be submitted electronically, as an e-mail attachment, created in either Adobe® PDF or in Microsoft® Word (Word 97 – Word 2007). Please e-mail the file to Denise Flaherty: flaherty@icdd.com. If you do not receive confirmation that the manscript was received within one week of your submission, contact Denise by email: flaherty@icdd.com or phone: 610.325.9814.

DENVER X-RAY CONFERENCE ORGANIZING COMMITTEE

Chair, **Robert Snyder**
Georgia Institute of Technology, Atlanta, GA, bob.snyder@mse.gatech.edu

Co-Chair, **W. Tim Elam**
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Mary Ann Zaitz
IBM, Hopewell Junction, NY, zaitz@us.ibm.com

2010 Denver X-ray Conference Registration Information

Denver Marriott Tech Center Hotel • Denver, Colorado, U.S.A.

2–6 August 2010

www.dxcicdd.com

On-line registration is available at: **www.dxcicdd.com**. Registration forms will also be included in the conference Program, printed in May, and on-site registration will be conducted at the conference.

Registration Fees: Discount fees will only apply if registration form and payment are received by **1 July 2010**.

	by July 1	after July 1
❑ Full week: exhibits, workshops, sessions†	$525	$600
❑ Monday & Tuesday: exhibits, workshops†	$475	$650
❑ Wed., Thurs. & Friday: exhibits, sessions†	$475	$650
❑ Session organizer, invited speaker & workshop instructor†	$100	$100
❑ Student (I.D. required)	$150	$225
❑ Unemployed	$150	$225
❑ 65 and older	$150	$225

† Includes a copy of Volume 54 of *Advances in X-ray Analysis* on CD-ROM.

Cancellation Policy: Cancellations must be submitted in writing to Denise Flaherty. A full refund will be issued, less a $50 processing fee, if the cancellation is received at least two weeks before the conference (Monday, 19 July 2010) No refunds will be issued for cancellations received after 19 July 2010.

Please contact Denise Flaherty for any additional information:
e-mail **flaherty@icdd.com** or phone **610.325.9814**.

THE NORTH AMERICAN CORE SHELL SPECTROSCOPY CONFERENCE

The North American Core Shell Spectroscopy Conference will be held concurrently with the 2010 Denver X-ray Conference. Details on the technical program and abstract submissions will be posted on the Denver X-ray Conference website: **www.dxcicdd.com**

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DATES TO REMEMBER

Exhibit packets mailed	1 February 2010
Deadline for submission of abstracts	15 February 2010
Conference programs mailed	May 2010
Deadline for pre-registration discount fee	1 July 2010
Deadline to book host hotel room at conference rate	16 July 2010
Deadline for submission of manuscripts	1 September 2010