

The 59th Annual Denver X-Ray Conference (DXC)

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The 59th Annual Denver X-Ray Conference (DXC) was held in Denver, Colorado from 2 to 6 August 2010 at the Denver Marriott Tech Center Hotel and was a joint meeting with the North American Core Shell Spectroscopy Conference (NACSSC). The meetings attracted more than 300 attendees and close to 160 exhibit staff.

Conference week began with 16 tutorial workshops for DXC, held on Monday and Tuesday, and 1 workshop for NACSSC, held on Tuesday morning. The topic for the NACSSC workshop was *Using FEFF to Model Real-World Systems*.

Topics for the DXC workshops included the following:

XRD and XRF:

Cultural Heritage I and II

XRD:

Survey of Basic XRD Applications

Trace Phase Identification Using Chemical Information

Texture Analysis I and II

Two-Dimensional Detectors

Polymers I and II

Pair Distribution Function

XRF:

Standards and Advanced Sample Preparation for XRF Analysis

Trace Analysis

Basic XRF

Quantitative Analysis I and II

Specimen Preparation XRF

Sessions for DXC were held Wednesday, Thursday, and Friday morning. Session topics included the following:

XRD and XRF:

New Developments in XRD and XRF Instrumentation

Cultural Heritage I and II

XRD:

Polymers/SAXS

Hanawalt Award Session: Nanostructure Studies Using the Atomic Pair Distribution Function

Rietveld Analyses I and II

Microdiffraction

Mile High Resolution

Stress Analysis

XRF:

Fusion and Industrial Applications of XRF

Environmental and Handheld XRF

Quantitative Analysis

X-Ray Imaging

Trace Analysis

The Plenary session, *The Greening of X-Rays: X-Rays and Renewable Energy*, took place on Wednesday morning and was organized by Robert L. Snyder, Georgia Institute of Technology, Atlanta, GA, and Brian Toby, APS–Argonne National Laboratory, Argonne, IL. Five invited talks were given during the plenary session:

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

Gabriela B. González Avilés, DePaul University, Chicago, IL

T. O. Mason, J. S. Okasinski, O. Warschkow, and D. E. Ellis, Northwestern University, Evanston, IL

J. P. Hodges, Oak Ridge National Laboratory, Oak Ridge, TN

T. Buslaps and V. Honkimäki, European Synchrotron Radiation Facility, Grenoble, France

Insights into Thermoelectric Materials: New Structures and Properties

Paul Zschack, Argonne National Laboratory, Argonne, IL

C. Heideman, Q. Lin, N. Nguyen, M. Smeller, C. Mortensen, and D.C. Johnson, University of Oregon, Eugene, OR

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 M. Alamgir, Georgia Institute of Technology, Atlanta, GA

FP-Based EDXRF Characterization of Thin Film Solar Cells

Volker Rößiger and J. Kessler, Helmut Fischer GmbH, Sindelfingen, Germany

M. Haller, Fischer Technology, Inc., Windsor, CT

At the Plenary session, the 2010 Birks Award was presented to Victor Buhrke, Consultant, Portola Valley, CA, to honor his significant contributions to the field of X-ray spectrometry. Dr. Buhrke had announced at an earlier date his retirement from the DXC Organizing Committee and was surprised with an additional plaque, thanking him for his service to the conference.

The citation read as follows:

This plaque is presented to Victor E. Buhrke on the occasion of his retirement from the Denver X-Ray Conference. This recognizes not only the all time record of attendance at 52 Denver Conferences but also his decades of dedicated

service and contributions to the Denver X-Ray Conference as a Session Chairman, Workshop Instructor, and both Chairman and Member of the Organizing Committee. A true scientist and a dear friend, we thank Dr. Buhrke for sharing his expertise, exceptional talent, and positive spirit.



Victor Buhrke, left, recipient of the 2010 Birks Award, with Robert Snyder, right.



Simon Billinge, left, and Takeshi Egami, far right, recipients of the 2010 Hanawalt Award, presented by Thomas Blanton, center.

The Hanawalt Award was also given at this year's conference. The award is presented every three years for an important recent contribution to the field of powder diffraction. The 2010 recipients were Takeshi Egami, University of

Tennessee, Knoxville, TN and Simon Billinge, Columbia University, New York, NY. The awards were presented during a special Hanawalt Award Session: Nanostructure Studies Using the Atomic Pair Distribution Function and were presented by Thomas Blanton, ICDD Chairman of the Board, Eastman Kodak Co., Rochester, NY.

There was no winner for the 2010 Jerome B. Cohen Student Award.

The Plenary session also provided a venue to memorialize the passing of Gordon S. Smith. A tribute poster was created with the help of Bob Snyder, Georgia Institute of Technology, Atlanta, GA and Quintin Johnson, MDI, Livermore, CA. The following is an excerpt from the tribute:

Many of us have memories of Gordon participating in a large number of Denver X-Ray Conferences over the years. Gordon was one of the scientists who initiated the renaissance of powder diffraction in the 1970s. This began with the development of laboratory computers allowing the automation of the powder diffractometer and the simultaneous evolution of large computers allowing in depth evaluation of powder diffraction standards. In 1978 he was a coauthor of "An Analysis of the Powder Diffraction File," an extensive study that led ultimately to the adoption by the ACA and the IUCr of "The Standard Form for Powder Diffraction Data." This laid the groundwork for the expansion of the Powder Diffraction File from ~40 000 to over 600 000 today.

The NACSSC began their sessions on Tuesday afternoon with the Stern Symposium, chaired by Daniel Haskel, APS-Argonne National Laboratory, Argonne, IL. The honoree, Edward A. Stern, was present and gave the closing remarks at the end of the session. The following invited talks were given during the symposium:

Studies of Li-Ion Battery Materials Using Synchrotron Methods

M. Balasubramanian, Argonne National Laboratory, Argonne, IL

XAS Studies of Phase Change Memory Materials in the Ge-Sb-Te System

M. Paesler, J. Washington, and G. Lucovsky, North Carolina State University, Raleigh, NC

Perfecting the EXAFS Equation

J. J. Rehr, University of Washington, Seattle, WA

Standardizing Novel Core-Shell Spectroscopies

G. Seidler, University of Washington, Seattle, WA

Electronic, Structural, and Thermal Properties of Nanocatalysts: Non-Metal, Non-Bulk, and Non-Debye

A. I. Frenkel, Yeshiva University, New York, NY

The Use of XAS Processes for Environmental Science

K. Kemner, M. Boyanov, E. O'Loughlin, K. Skinner, D. Sholto-Douglas, B. Lai, F. DeCarlo, and D. Mancini, Argonne National Laboratory, Argonne, IL

E. Carpenter, Virginia Commonwealth University, Richmond, VA

W. Walsh, Naperville, IL

K. Nealson, University of Southern California, Los Angeles, CA

In addition to the Stern Symposium, the NACSSC hosted five special sessions that included 26 oral presentations.

Poster sessions were held on Monday and Tuesday of conference week. Judges were appointed each night to select the best posters. The following posters were selected as the best:

XRD:

An Alternative Voyage through Reciprocal Space

K. D. Rogers, J. Rogers, and A. Dicken, Cranfield University, Cranfield, Bedfordshire, United Kingdom

P. Evans, J. W. Chan, and X. Wang, Nottingham Trent University, Nottingham, United Kingdom

Nano-Beam X-Ray Diffraction Reveals Structural and Mechanical Gradients in Nano-Crystalline Thin Films

J. Keckes and M. Bartosik, University Leoben, Leoben, Austria

G. Maier, Materials Centre Leoben, Leoben, Austria

M. Burghammer, ESRF, Grenoble, France

XRD Winning Smiles: Analysis of Dental Calculus in Bioarchaeology

S. Beckett, C. Greenwood, S. Ralph, and K. D. Rogers, Cranfield University, Shrivenham, United Kingdom

K. Hardy, BioArch, University of York, York, United Kingdom

J. G. Clement, The University of Melbourne, Melbourne, Australia

XRF:

Levels and Spatial Distribution of Trace Elements in

Bone Following Strontium Treatment in Calcium Deficient Rats

F. Meirer, Atominstitut, Technische Universitaet Wien, Vienna, Austria and Stanford Synchrotron Radiation Light-source, Menlo Park, CA

J. G. Hofstaetter, Hanusch Hospital, Vienna, Austria and Vienna General Hospital, Vienna, Austria

S. Smolek, B. Pemmer, P. Wobrauschek, and C. Strelti, Atominstitut, Technische Universitaet Wien, Vienna, Austria

R. Simon, Forschungszentrum Karlsruhe GmbH, Eggenstein-Leopoldshafen, Germany

R. K. Fuchs, M. R. Allen, K. W. Condon, S. Reinwald, and D. B. Burr, Indiana University, Indianapolis, IN

D. McClenathan, B. Keck, and R. J. Phipps, Proctor and Gamble Pharmaceuticals, Mason, OH

Analytical Performance of Newly Developed 2D/3D-XRF Instruments

T. Nakazawa, K. Nakano, and K. Tsuji, Osaka City University, Osaka, Japan

The Determination of Copper Speciation in Breast Tumor Tissue Using a Compact, Short Focal Distance Bent Crystal Laue Analyzer

N. Kujala and R. Barrea, BioCAT, Illinois Institute of Technology, Chicago, IL

C. Karanfil, Mugla University, Kotekli-Mugla, Turkey

D. Chen and Q. P. Dou, Wayne State University, Detroit, MI

Exhibits at the conference ran from Monday to Thursday with 46 companies displaying their various products and services for X-ray powder diffraction and X-ray fluorescence spectrometry. The following companies participated at the exhibits:

Alfa Aesar, a Johnson Matthey Co.

AMPTEK, Inc.

Angstrom, Inc.

Anton Paar

Blake Industries, Inc.

Bruker AXS

Brush Wellman Electrofusion Products

Chemplex Industries

Corporation Scientifique Claisse, Inc.

e2v Scientific Instruments

Hecus X-Ray Systems

Heraeus Platinum Labware

Herzog Automation Corporation

Horiba Scientific

Huber Diffractionstechnik-AXO DRESDEN GmbH

IMP Group PTY LTD

INCOATEC GmbH

Innov-X Systems, Inc.

International Centre for Diffraction Data (ICDD)

KETEK GmbH

Kitco Metals, Inc.

Materials Data Inc. (MDI)

Micro Photonics, Inc.

Micromatter (AAPS)

MOXTEK, Inc.

Opti Temp, Inc.

Oxford Cryosystems

PANalytical

Panasonic Corporation

PNDetector GmbH

Premier Lab Supply, Inc.

Proto Manufacturing, Inc.

Rigaku Americas Corp.

Rigaku Innovative Technologies, Inc.

Rocklabs Limited

Roanalytic GmbH

Sietronics Pty Ltd

SII Nanotechnology USA, Inc.

SPEX Sample Prep LLC

Thermo Scientific-Niton XRF Analyzers

Thermo Scientific-Scientific Instruments

Wiley-Blackwell

Xenocs SA

XGLab S.R.L.

XIA LLC

X-Ray Optical Systems, Inc.

To see a complete list of the products and services that the exhibitors displayed at the DXC, please visit the website: <http://www.dxcicdd.com/10/exhibitors.htm>.

Social events were also held during conference week. Thermo Scientific and ICDD sponsored the Monday evening poster session and wine and cheese reception. Tuesday evening's reception and poster session was sponsored by Chemplex. Exhibits remained open on both nights. On Thursday evening, an off-site event was held in lower downtown Denver, the "Historical Hauntings–LoDo Ghost Tour." The night began with dinner in one of the Mile High City's former "Red Light District" brothels, the Rox Room, formerly known as Mattie's House of Mirrors. Following din-

ner, a professional historian and "ghost guide" took attendees on a walking tour of the restored 100-year-old buildings and warehouses of LoDo.

The Organizing Committee would like to acknowledge the workshop instructors, invited speakers, and session chairs for all the time and effort they volunteered to make this conference a great success. They would also like to send their appreciation to Thermo Scientific and Chemplex for supporting the poster sessions. For a preview of the 2011 Program, visit www.dxcicdd.com.