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INTERNATIONAL REPORT

2017 Denver X-ray Conference (DXC)

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LOCATION, DATES AND ATTENDANCE

The Denver X-ray Conference (DXC) traveled north and returned to the Big Sky Resort in Big Sky, Montana, USA, for its 66th Annual Conference on Applications of X-ray Analysis. The conference took place on 31 July–4 August 2017 with close to 300 registered attendees and 150 exhibit personnel. X-ray and materials scientists gathered at the conference to discuss various techniques, applications, software, instruments, and products for XRD and XRF analyses. The combination of attendees and exhibitors brought the total attendance to almost 450 X-ray scientists, with 30% from outside the USA.

WORKSHOPS

Conference week began with 19 half-day workshops held on Monday and Tuesday of conference week. Subjects focused on both beginner and advanced levels, with 38 specialists invited to participate as workshop instructors.

PLENARY SESSION

Technical sessions ran Wednesday through Friday of conference week, beginning with the Plenary Session "Inspecting the Infrastructure – Safeguarding with X-rays". The session was chaired by Conal Murray, IBM T.J. Watson Research Center, and Don Broton, CTLGroup. The Plenary consisted of award presentations followed by three key-note speakers.

The awards presented during the Plenary Session were:

The 2017 Jenkins Award, recognizing lifetime achievement in the advancement of the use of X-rays in materials analysis, was presented to James Kaduk, Polycrystallography, Inc. and Illinois Institute of Technology, for his broad achievements in discovery, research, and education in the use of X-rays for materials analysis.

The 2017 Barrett Award, in recognition of outstanding contributions to powder diffraction, was presented to Daniel Louër, France, for his involvement with powder diffraction in indexing, line profile analysis, and *ab initio* structure solution, as well as his service to the community through ICDD and EPDIC. Dr. Louër was unable to attend DXC and will accept the award at the ICDD Annual Meetings in 2018.

The 2017 Jerome B. Cohen Student Award, recognizing outstanding achievements of student research in X-ray analysis, was won by Howard Joress, Cornell University, for his work, *A Polycapillary-Based Method of Monochromatic Time-Resolved X-ray Reflectivity*. Howard presented his work at the conference during the *General XRD* session.

The 2017 Robert L. Snyder Student Award grants were presented to 11 outstanding young scientists. The awardees and the works they presented at the conference were:

Janeth Sarmiento Arellano, Benemerita Universidad Autonoma de Puebla, *Phase Transformation and Enhancement of Structural Properties on CdSe Films with Annealing in Air Atmosphere.*

Gangadhar Das, Homi Bhabha National Institute, *Depth Resolved Chemical Speciation of a Superlattice.*

Brianna Ganly, University of New South Wales, *Particle Size Effects in X-ray Fluorescence Analysis of Iron and Copper Minerals.*

Jessica Hamilton, Monash University, *Mg-carbonate Cements Trap Potentially Toxic Trace Metals and CO_2 at Woodsreef Mine, New South Wales.*

Howie Joress, Cornell University, *A Polycapillary Based Method of Monochromatic Time-Resolved X-ray Reflectivity.*

Gabriella Mankovskii, Ryerson University, *Total Reflection X-ray Fluorescence Based Method Development for Quantification of Gold Nanoparticles in Breast Cancer Cells.*

Lauren O'Neil, University of Washington, *Extracting Further Information from an X-ray Fluorescence Spectrum through Modeling of X-ray Scattering.*

Josef Prost, Vienna University of Technology, *Trace Element Analysis of Airborne Particulate Matter with TXRF and SR-TXRF-XANES.*

Shigehiro Takajo, Los Alamos National Laboratory, *Spatially Resolved Texture and Microstructure Evolution of Gas Gun Deformed SUS304 Steel using Neutron Diffraction.*

Connor Turvey, Monash University, two presentations: *Hydrotalcites as a Carbon Sink in Serpentinites* and *First Impressions Count: Applications of Field Portable X-ray Diffraction to Environmental Monitoring of Mine Sites.*

Cassidy VanderSchee, McGill University, *Detection of Localized Tungsten Deposition and Speciation in Bone using μXRF and μXANES.*

The 2017 ICDD Fellow Award, given by the ICDD Board of Directors to individuals who have given their time and talents beyond that normally associated with membership, was presented to Thomas R. Watkins, Oak Ridge National Laboratory, honoring his two decades of leadership at the DXC and his strong support of the ICDD.

After the awards were presented, the Plenary session continued with three fascinating talks by renowned keynote speakers: Paul Stutzman of the National Institute of Standards and Technology spoke on, *Hydraulic Cements for Construction: Cementitious Materials, Standards, Specifications, and X-ray Analysis.* His talk was followed by a presentation from George Seegebrecht of Concrete Consulting Engineers, *The Role of Chemistry in Materials Verification and Troubleshooting.* The session concluded with the talk, *Neutron Diffraction and the Art of Infrastructure Maintenance*, given by Cev Noyan of Columbia University.

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SPECIAL SESSIONS

Over 220 presentations were organized in the oral and poster sessions. Seventeen half-day special sessions (140 oral presentations) filled the remainder of the week. Twenty-seven of the presentations were given by invited speakers, experts in their respective fields.

POSTER SESSIONS AND BEST POSTER AWARDS

Nearly 90 posters were presented on Monday and Tuesday evening during the XRD and XRF poster sessions. Judges had a difficult time choosing the Best Poster Awards, as the competition was intense. Ultimately, the following presenters were named winners:

XRD Best Poster Awards presented to:

Structural Characterization of GaN Layers Grown on Graded-AlGaN/GaN/c-Al_2O_3 Templates by HRXRD, GIXD, AFM and TEM

A. Kuchuk, H. Stanchu, Yu. Mazur, P. Lytvyn, C. Li, Y. Maidaniuk, M. Benamara, M. Ware, G. Salamo, University of Arkansas, USA; M. Schmidbauer, Leibniz-Institut für Kristallzüchtung, Germany.

Rietveld Analysis of X-ray Powder Diffraction Patterns of Zr-Based Alloy System

C. Silva, K. Leonard, Oak Ridge National Laboratory, USA; F. Ibrahim, Earlham College, USA.

XRD Best Student Poster presented to:

Atom Dynamic of Amorphous Materials ($Ni_{0.60}Nb_{0.4})_{100-x}Zr_x$ (x = 0 to 30) by X-ray Photon Correlation Spectroscopy, Neutron Studies

S. Sarker, D. Chandra, Q. An, W.M. Chien, University of Nevada, Reno, USA; B. Ruta, European Synchrotron Radiation Facility, France; T.J. Udovic, NIST Center for Neutron Research, USA; G. King, Los Alamos National Laboratory, USA; D. Isheim, Northwestern University, USA.

XRF Best Poster Awards presented to:

Visualizing Artist's Techniques through Macro-XRF Scanning of Painted Works

D. MacLennan, C. Schmidt Patterson, L. Lee, N. Daly, K. Trentelman, Getty Conservation Institute, USA; Y. Szafran, N. Turner, J. Paul Getty Museum, USA.

Use of Multivariate Analysis for Detecting Orientation Changes in Steel Via Laue Diffraction Artifacts within XRF Spectra

M.A. Rodriguez, M.H. Van Benthem, J.J.M. Griego, D.F. Susan, P. Yang, C.D. Mowry, D. Enos, Sandia National Laboratories, USA.

XRF Best Student Poster:

Investigation of the Local Manganese Distribution in Bone in Female and Male Osteoporosis Compared to Healthy Controls

A. Turyanskaya, M. Rauwolf, T. Bretschneider, P. Wobrauschek, C. Streli, Atominstitut, TU Wien, Austria; A. Roschger, J. Hofstaetter, P. Roschger, Hanusch Hospital, Austria; J. Hofstaetter, Orthopaedic Hospital Vienna-Speising, Austria; I. Zizak, Helmholtz-Zentrum Berlin für Materialien und Energie, Germany.

EXHIBITS

The exhibit hall was sold out of space as 47 companies shared their displays of products and services for the X-ray community. A complete listing of exhibitors and their product descriptions can still be found on the conference website: http://www.dxcicdd.com/17/exhibitors.htm.

SOCIAL EVENT AND SPONSORSHIPS

The conference was fortunate to have many generous companies offer their financial support as sponsors. Bruker once again reigned as Platinum Sponsor of the DXC, inviting every attendee, exhibitor, spouse, and guest to a huge outdoor party in the mountains, complete with western barbeque foods, abundant libations, music, and prizes. Chemplex Industries, Inc. also continued their tradition of participating as Gold Sponsors, and Silver sponsorships were received from DECTRIS Ltd., KETEK, Proto, Specac, Inc., and XOS. The generous donations from all the companies listed help to keep attendee costs low and the quality of the conference high. We could not be more thankful and grateful for their support!

WEBSITE, ABSTRACTS, AND PROCEEDINGS

To view the complete DXC Program, including abstracts, please visit the Program page of the conference website, http://www.dxcicdd.com/17/program.htm. The conference proceedings, *Advances in X-ray Analysis*, Volume 61, will be published in the summer of 2018. Select papers will also be published in *Powder Diffraction*. Please also visit the Resources page of the ICDD website: www.icdd.com for free full access to manuscripts published in Volumes 40 through 58 of Advances in X-ray Analysis.

FUTURE CONFERENCES

The 2018 DXC will be held on 6–10 August 2018 at The Westin Westminster, Westminster, CO, USA. Please be sure to monitor our website for tentative program information, and the *Call for Papers*, which will begin in January.

In 2019, the DXC will return to the Chicago area, 5–9 August, at a new hotel, The Westin Lombard Yorktown Center, Lombard, IL, USA.

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