DENVER X-RAY CONFERENCE®

ON-SITE PROGRAM

62nd Annual Conference on Applications of X-ray Analysis

The Denver X-ray Conference

5–9 August 2013

The Westin Westminster • Westminster, Colorado, U.S.A.

Plenary Session

The 100th Anniversary of X-ray Spectroscopy

Training & Applications

Techniques & Instrumentation

Exhibits, Workshops, Sessions

Free CD of the Proceedings

Sponsored by International Centre for Diffraction Data

ICDD® International Centre for Diffraction Data

ISO 9001:2008 QUALITY ASSURED COMPANY CERT.NR. 11409.1

Chemplex® INDUSTRIES, INC.

IOS Press — Impacting the World of Science

SRN Synchrotron Radiation News

Premier Lab Supply

DENVER X-RAY CONFERENCE ORGANIZING COMMITTEE

Next Year's Conference:
28 July–1 August 2014
Big Sky Resort, Big Sky, Montana

TABLE OF CONTENTS

EXHIBIT BOOTH ASSIGNMENTS

Exhibits will be held in the Westminster Ballroom, lobby level of the Westin Westminster hotel.

Company	*Booth Number(s)*
AMPTEK Inc.	5
Angstrom, Inc.	23
Blake Industries, Inc.	41
Bruker	6, 7, 15
Chemplex Industries, Inc.	1, 2
Claisse, Corporation Scientifique	4
Herzog Automation Corp.	20
Hitachi High-Technologies Science America, Inc.	13
HORIBA Scientific	12
Huber Diffraction GmbH/ AXO Dresden	42
IFG - Institute for Scientific Instruments GmbH	26
Incoatec GmbH	14
Inel, Inc.	45
International Centre for Diffraction Data	9, 10
KETEK	21
labZY	22
Materials Data, Inc	54 & 55
Materion Electrofusion	46
Micromatter	50
Mikron Digital Instruments, Inc.	43
Mineral Stats Inc.	35
Moxtek, Inc.	31, 32
Navas Instruments	40
Olympus	49
PANalytical	57, 58, 59, 60
Premier Lab Supply	11
Proto Manufacturing	51, 52
Rigaku Americas Corp.	28, 29, 30
Rigaku Innovative Tech	27
SGX Sensortech (MA) Ltd.	56
Spectro Analytical Instruments	44
SPEX SamplePrep	8
Thermo Scientific	24, 25
X-BRIDGE Technologies Co., Ltd.	16
XIA, LLC.	3
XOS	36

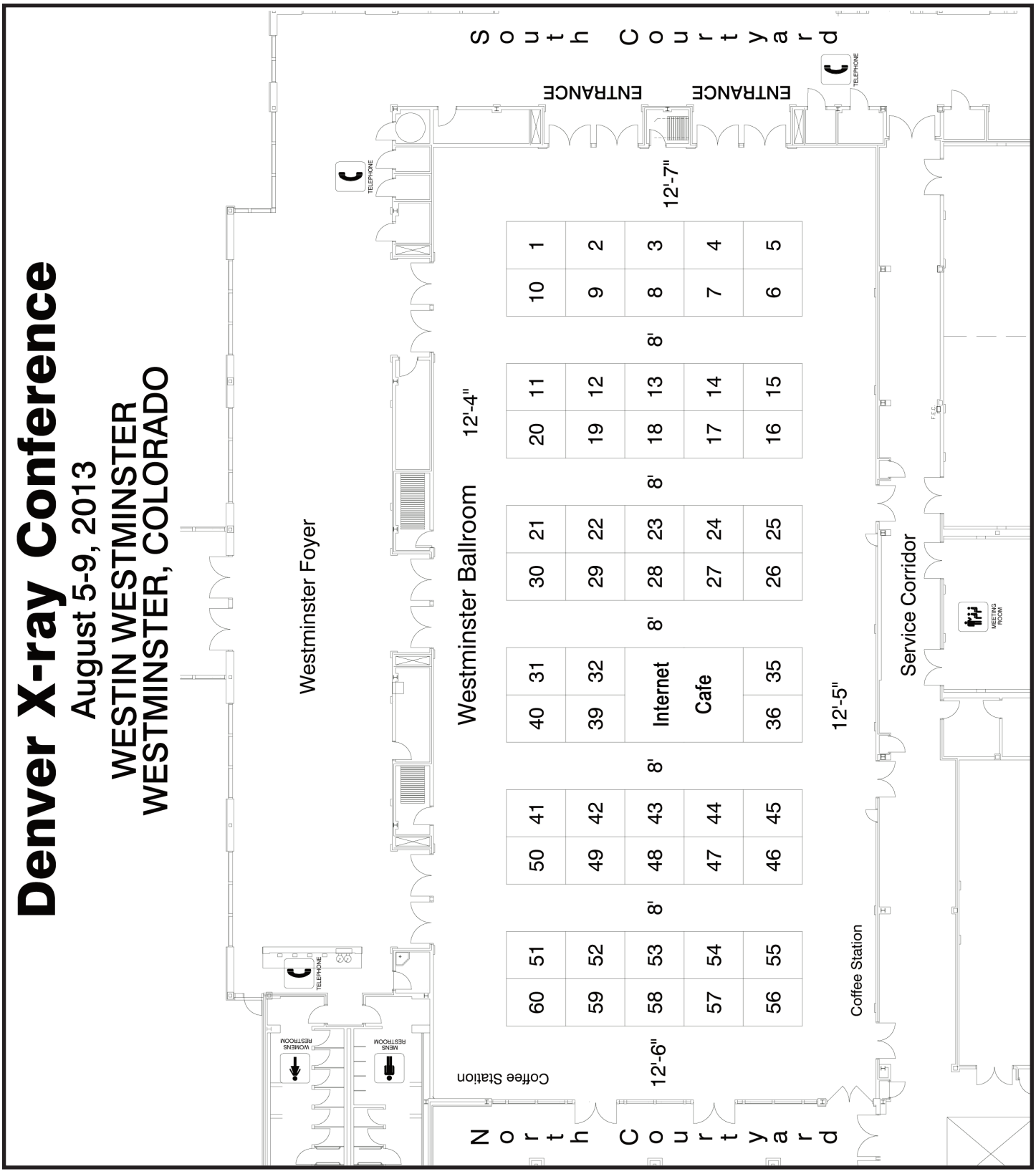
Exhibit Hours

Monday & Tuesday: 11:00 am – 5:00 pm
Wednesday: 12:00 pm – 7:00 pm *(Reception in the exhibit hall from 5:30–7:00 pm)*
Thursday: 10:00 am – 1:00 pm

The following coffee breaks are served in the Exhibit Hall:

Monday pm Break 2:30 – 3:30
Tuesday pm Break 2:30 – 3:30
Wednesday pm Break 2:45 – 3:45
Thursday am Break 10:00 – 11:00

EXHIBIT FLOOR PLAN & INFORMATION



2013 EXHIBITORS

COMPANY — EXHIBITOR PRODUCTS

AMPTEK Inc.
Booth: 5
Website: www.amptek.com
Email: sales@amptek.com
Phone: 781.275.2242

Introducing FAST SDD detectors with 10 times the throughput of a standard SDD. Typical resolution of 125 eV FWHM at 8 µs peaking time, or 155 eV FWHM at 0.2 µs and 1,000,000 counts per second. Also available—high performance, standard SDD detectors and Si-PIN detectors. Amptek offers simple to use, low-cost systems that are ideal for laboratory and field use and for OEMs developing table-top or hand-held XRF analyzers. Amptek—OEMs #1 choice.

Angstrom, Inc.
Booth: 23
Website: www.angstrom-inc.com
Email: sales@angstrom-inc.com
Phone: 800.395.5393

Angstrom manufactures the well known TE250 Laboratory Ring Pulverizer and 4451AE Laboratory Briquet Press for preparation of various types of samples for X-ray analysis. Both products are built to last, providing many years of service and are rugged enough to handle the toughest workloads. A programmable version of the 4451AE Press is also available and will be on display at the Angstrom booth. A complete line of aluminum sample cups are offered to complement the 4451AE Briquet Press.

Blake Industries, Inc.
Booth: 41
Email: blake4xray@att.net
Phone: 908.233.7240

Blake Industries is the leader in supplying high precision X-ray and neutron instrumentation to research laboratories, universities and synchrotron beam lines worldwide. We are the exclusive distributors for Huber instruments in the United States, Mexico and Canada with multiple installations at all the North American Synchrotrons and have been supplying X-ray users for over 40 years.

Bruker
Booths: 6, 7, 15
Website: www.bruker.com
Email: info@bruker.com
Phone: 800.234.XRAY

Bruker AXS is the worldwide leading supplier of advanced X-ray solutions. Continual innovation in X-ray sources, optics, detectors, software and sample handling ensures that Bruker is able to offer a solution for virtually any X-ray analytical task. Visit us to see the latest innovations in diffraction systems, including the D8 DISCOVER with DAVINCI and the D2 PHASER. We also offer a full spectrum of fluorescence spectrometers—floorstanding, benchtop and handheld. Unique classroom and online trainings complete the Bruker product portfolio.

Chemplex Industries, Inc.
Booths: 1, 2
Website: www.chemplex.com
Email: sales@chemplex.com
Phone: 1.800.424.3675

"Making Spectroscopy Work for You"™ One Stop Shopping for all XRF Sample Preparation Equipment, Accessories, Standards and Supplies. XRF and SpectroSulfur® analyzer sample cups; Ultra-Polyester®, Mylar®, Prolene®, Etnom®, Polypropylene, SpectroMembrane® thin-film windows; transfer pipettes; SpectroPress® with Automated Integrated Die Assembly; stainless steel die sets and compressible tapered aluminum PelletCups®; GyralGrinder® and SpectroMill® grinding/mixing machines; grinding/briquetting X-ray Mix® and SpectroBlend® additives; sample storage pods; X-ray tube safety SpectroFilm®; petrochemical SpectroStandards®; fusion machines and pre-fused fusion fluxes. Order On-Line Anytime. www.Chemplex.com.

Claisse, Corporation Scientifique
Booth: 4
Website: www.claisse.com
Email: maprovencher@claisse.com
Phone: 1.866.345.6453

A world leader in sample preparation by fusion for XRF spectrometry, Claisse® manufactures gas and electric automatic instruments and platinumware for glass disks preparation, all of which set new benchmarks in fusion capabilities. The same is true for Claisse's rFusionTM robotized fusion system, TheAnt™ automatic weigher and flux dispenser, as well as industry-leading fused borate fluxes featuring the lowest moisture/highest purity with integrated non-wetting agents. Claisse® provides certified reference materials, fusion monitors, in addition to analytical consulting and platinum polishing/scrap services.

2013 EXHIBITORS

COMPANY — EXHIBITOR PRODUCTS

Herzog Automation Corp.
Booth: 20
Website: www.herzogautomation.com
Email: info@herzogautomation.com
Phone: 440.891.9777

Herzog Automation Corp. is the leading supplier of manual and fully automatic sample preparation systems for spectrographic and X-ray analysis, tube delivery systems for sample transport, and laboratory automation for the steel, aluminum, cement and mining industries. Please visit our website at www.herzogautomation.com for our full product line.

Hitachi High-Technologies Science America, Inc.
Booth: 13
Website: www.hitachi-hitec-science.us
Email: info@hitachi-hitec-science.us
Phone: 818.280.0745

Hitachi High-Technologies Science America's, ~50 and 100 mm^2, excellent resolution, Silicon Drift, X-ray Detectors perform consistently at extremely high count rates with stable resolution and peak position. Developed and customized for synchrotron applications, including UHV, the LN2 free, Vortex® is the 'champion' on many beam lines. Compelling advantages include rugged reliability for experimental stations and OEM applications. The Vortex is available in single and four element configurations. Now, introducing the 1mm thick detector for improved performance at higher energies!

HORIBA Scientific
Booth: 12
Website: www.horiba.com/scientific
Email: info.sci@horiba.com
Phone: 732.494.8660

HORIBA Scientific's XGT systems offer high performance energy dispersive X-ray fluorescence (EDXRF) analysis with unique capabilities. Patented XGT (X-ray Guide Tube) technology combines traditional X-ray fluorescence methodology with small spot analysis. High intensity X-ray beams with diameters ranging from 3 mm down to a unique 10 µm offer versatile analysis capabilities. X-ray Fluorescence is useful for applications including forensics, geology, materials, biology/medicine, electronics, archaeology, engine wear analysis, pharmaceuticals, and RoHS/ELV compliance testing. Stop by and see our new MESA-50 EDXRF Analyzer.

Huber Diffraction GmbH/ AXO Dresden
Booth: 42
Website: www.xhuber.com
Email: info@xhuber.com
Phone: +49 8051 68780

Huber Diffraction is a manufacturer of precise positioning and diffraction equipment for laboratory and synchrotron applications. We present a new beam conditioning unit for protein crystallography as well as our known precision motion systems. AXO Dresden presents latest developments in X-ray multilayer optics both for 1dim and 2dim diffraction application (5keV < E < 30keV) and soft X-ray polarization (E<= 1keV).

IFG—Institute for Scientific Instruments GmbH
Booth: 26
Website: www.ifg-adlershof.de
Email: info@ifg-adlershof.de
Phone: +49 30 6392 6500

IFG—Institute for Scientific Instruments GmbH is one of the leading global providers of X-ray polycapillary optics and X-ray analytical devices. Core competence is the development and manufacture of polycapillary optics, used for beam shaping of X-rays. Those are supplied to several major analytical instrument companies and also used in some of IFG's own products. Other products include the modular X-ray source iMOXS, ELBRUS XRF, a measurement system for on-line technology control, PXS, a femtosecond X-ray source and SLcam®, the X-ray color camera.

Incoatec GmbH
Booth: 14
Website: www.incoatec.de
Email: info@incoatec.de
Phone: +49 4152 889 381

Incoatec is your partner for Multilayer Optics and Microfocus Sources. We offer Optics for XRD, Light Element Analyzer Crystals for XRF and the Microfocus Source IµS. Its outstanding performance raises the standard of low-maintenance sealed-tubes for XRD and is available for all typical wavelengths. For synchrotrons we produce customized reflection and multilayer optics. New are our SCATEX pinholes for SAXS. They prevent parasitic scattering and enable more compact instrumental set-ups with higher performance. SCATEX for synchrotron beamlines is available, too.

2013 EXHIBITORS

COMPANY — EXHIBITOR PRODUCTS

Inel, Inc.
Booth: 45
Website: www.inel.us
Email: info@inel.us
Phone: 603.778.9161

Serving the X-ray diffraction community for over 30 years, Inel is one of the world's leading suppliers of quality X-ray diffractometer systems incorporating curved or linear position sensitive detectors. Built for speed and resolution, our Equinox product line ranges from bench top models to large laboratory instruments. Applications include powders, combinatorial chemistry and materials analysis, micro-diffraction, polymers, capillaries, in situ, on-line, transmission and reflection, small angle scattering, reflectometry, texture analysis, thin films, and variable temperature dynamic studies.

International Centre for Diffraction Data
Booths: 9, 10
Website: www.ICDD.com
Email: Marketing@icdd.com
Phone: 610.325.9814

Over the past 72 years, our mission has focused on meeting the needs of the scientific community through the publication of the Powder Diffraction File™ and by providing forums for the exchange of ideas and information. The Powder Diffraction File is available in the PDF-4+, PDF-2, and PDF-4/Minerals for inorganic analysis and PDF-4/Organics for organic analysis. ICDD promotes the application of materials characterization methods by sponsoring the Denver X-ray Conference; its proceedings, *Advances in X-ray Analysis* and the journal, *Powder Diffraction*.

KETEK
Booth: 21
Website: www.KETEK.net
Email: info@KETEK.net
Phone: +49-896734677 1

As the leading manufacturer of Silicon Drift Detectors, KETEK is offering a broad SDD portfolio with active areas from 7mm² up to unprecedented 150mm². With our new ultra low capacitance VITUS series, energy resolutions below 123eV with P/B ratios > 25.000 and count rates up to 2 Mcps are achievable at low dead times. Our new and complete VICO electronics series allows tailored OEM solutions, optimized for VITUS SDDs. KETEK further presents its brand new Silicon Photo Multiplier (SiPM) family with unprecedented PDE, exceeding 60%.

labZY
Booth: 22
Website: www.labzy.com
Email: info@labzy.com
Phone: 505.438.6232

Twenty years ago we developed the world's first real time digital pulse processing radiation spectrometer and we continue to introduce new revolutionary products. Our open spectroscopy platforms, based on digital pulse processing, offer exceptional performance in exceptionally small packages. labZY low-power X-ray spectrometers and multichannel analyzers are fully user configurable and customizable—perfect solution for education and research. Our SLA technology breaks the FWHM statistical limit—SDD with resolution below 100eV.

Materials Data, Inc.
Booth: 54 & 55
Website: www.materialsdata.com
Email: mdi@materialsdata.com
Phone: 925.449.1084

MDI (www.MaterialsData.com) creates software for X-ray Powder Diffraction. Our products for XRD Analysis and Instrument Control are strongly embraced world-wide. We're a group of PhD Materials Scientists with a vision for better methods to analyze, characterize, quantify and simulate both the exotic and routine. For over 25 years we have continued to bring break-through ideas and methods to the XRD community. Visit our booth at DXC for a demo of all the latest Jade software tools as well as a closer look at the rest of the MDI's software products for XRD professionals and students.

Materion Electrofusion
Booth: 46
Website: www.materion.com/electrofusion
Email: electrofusion@materion.com
Phone: 510.623.1500

Leader in the fabrication of beryllium and beryllium oxide windows and assemblies for analytical, scientific and medical X-ray tubes and detectors. We offer high-purity beryllium windows and assemblies, as thin as 8µm. Purity grades up to 99.8% and our artifact-free IS-50M® grade developed for use in mammography and other sensitive oncology applications. A range of high temperature or economical protective coatings, and a suite of metallic target coatings for transmission tubes are our specialty.

2013 EXHIBITORS

COMPANY — EXHIBITOR PRODUCTS

Micromatter
Booth: 50
Website: www.micromatter.com
Email: info@micromatter.com
Phone: 604.221.2286

MICROMATTER has provided XRF calibration standards for more than 40 years. All reference materials are produced by vacuum deposition on polymer backings. Several mounting options are available. MICROMATTER also produces diamond-like carbon foils for applications in particle and accelerator physics as well as thin film and multilayer coatings.

Mikron Digital Instruments, Inc.
Booth: 43
Website: www.mikrondigitalinstruments.com
Phone: 800.925.3905

Mikron Digital Instruments provides XRF/XRD sample preparation equipment. MDI-250CC Ring Pulverizer is a very quiet 58db-64db centrifugal flat table grinder with options for programmable speeds and multiple programs. The PSP-80K Programmable Stepping Press includes up to 10 programs. Our touch screen display allows selecting a program to Step/Hold or ramp to pressure, hold at pressure and pressure release all under computer control. We provide repair services onsite or at our factory for Dietert/Foundry Test and other popular presses.

Mineral Stats Inc.
Booth: 35
Website: www.mineralstats.com
Email: info@mineralstats.com
Phone: 720.789.8988

Mineral Stats Inc. represents the best sampling and sample preparation equipment found on the world market today. Our staff brings over 50 years of expertise in sampling, sample preparation and testing. We advise our clients on cutting mills, ring mills, puck mills and bowls, crushers, splitters, sample dividers, drying ovens, fire assay equipment, screens, filter presses, and automated sampling stations, from brands such as Laarmann, FLSmidth Essa, Rocklabs, and Progradex. For more information please visit us at www.mineralstats.com.

MOXTEK, Inc.
Booths: 31, 32
Website: www.moxtek.com
Email: info@moxtek.com
Phone: 801.225.0930

Moxtek is a leading supplier of enabling nano-optical and X-ray technology used in display electronics, imaging, and analytical instrumentation. Moxtek provides innovative, solution-based products focused on performance, quality, and value. Moxtek X-ray products enable compact handheld and benchtop elemental analysis for positive material identification. Moxtek products are used in EDXRF systems for environmental screening, hazardous substance analysis, and sorting and recycling. Moxtek products are optimal for low-Z elemental analysis in electron microscopy.

Navas Instruments
Booth: 40
Website: www.Navas-Instruments.com
Email: Info@Navas-Instruments.com
Phone: 843.347.1379

XRF sample bead preparation is plagued with complex, unreliable, labor-intensive processes with a fantastically high price. Navas Instruments introduces modular, simple, bench size, XRF sample prep providing 750 - 900 beads per day, with simultaneous L.O.I. Expandable from 4 beads up to 16 beads. Modular components not reliant of each other for operation. Safe, efficient (2500 watt) enclosed electric furnace does not waste energy between batches. Very little cleaning as beads are cast in the same platinum crucible-mold.

Olympus
Booth: 49
Website: www.olympus-ims.com
Email: paul.pipitone@olympusndt.com
Phone: 781.419.4367

OLYMPUS NDT Analytical Instruments provides portable X-ray Fluorescence (XRF) and X-ray Diffraction (XRD) products. New for 2013, the BTX Profiler, combines award winning XRD and XRF technology into a single instrument. This no compromise approach allows the user to achieve excellence in analysis for both XRF and concurrent XRD measurements. Based, in part, on the underlying technology found in the Mars rover Curiosity, BTX Profiler introduces a new level of performance for concurrent XRF/XRD analysis in a compact, affordable design.

2013 EXHIBITORS

COMPANY — EXHIBITOR PRODUCTS

PANalytical
Booths: 57, 58, 59, 60
Website: www.PANalytical.com
Email: ask@panalytical.com
Phone: 508.647.1100

Identifying materials, controlling processes, delivering the Ultimate Customer Experience - PANalytical has a mission to design, develop, and supply the X-ray analytical solutions our customers need. Our systems deliver the highest quality results whether in the drive for R&D or superior quality control. Come see the latest advancements in XRD, XRF, sample prep equipment, software, standards and quality programs. All are delivered with application and service expertise for complete solutions to your material analysis challenges.

Premier Lab Supply
Booth: 11
Website: www.premierlabsupply.com
Email: info@premierlabsupply.com
Phone: 772.873.1700

PREMIER Lab Supply, Inc. is a Florida based manufacturer and supplier of XRF sample preparation equipment, accessories and Platinum Labware items. Our product portfolio provides solutions to meet our customers' needs in the areas of AA, ICP and XRF Spectroscopy. Products offered include, Electric Fusion Machines, Borate Fluxes, Grinder Mills, Presses, and Platinum Labware. Our Platinum Labware products include standard & low form crucibles, dishes, fusion labware and more; an exchange program is available for metal recycling. Booth 11 www.premierlabsupply.com.

PROTO Manufacturing
Booths: 51, 52
Website: www.protoxrd.com
Email: proto@protoxrd.com
Phone: 313.965.2900

PROTO Manufacturing is a leading provider of portable and laboratory based X-ray diffraction systems and services including: X-ray diffraction residual stress measurement; X-ray diffraction retained austenite and nitride analysis; Laue single crystal orientation systems; Custom powder diffraction systems; Fine focus and micro-focus X-ray tubes; and Electropolishers. PROTO Manufacturing also provides measurement services through its ISO 17025 accredited laboratories in the United States, Canada and Japan.

Rigaku Americas Corporation
Booths: 28, 29, 30
Website: www.rigaku.com
Email: info@rigaku.com
Phone: 281.362.2300

Rigaku provides the world's most complete line of X-ray diffraction and X-ray fluorescence instruments and components. Systems include the MiniFlex benchtop XRD and Supermini benchtop WDXRF systems, the Ultima IV and SmartLab® multi-purpose diffractometers with SAXS and in-plane capabilities, DMAX Rapid II micro-diffraction systems, SMAX3000 small angle scattering systems, and the ZSX Primus series of high-powered WDXRF spectrometers with mapping capabilities, in either tube-above or tube-below configurations.

Rigaku Innovative Technologies, Inc.
Booth: 27
Website: www.rigaku.com
Email: info@rigaku.com
Phone: 248.232.6400

Rigaku, the originator of graded multilayer X-ray optics and microfocus X-ray generators, introduces Arc)Sec® Technology for the best instruments ever! Come learn why Osmic™ multilayer optics, beam modules and CCD detectors outshine all others. With the widest range of solutions for line- and point-focus XRD and XRF, Rigaku can help you with application specific products. VariMax™ and Confocal Max-Flux® Optics provide high flux and controlled divergence for single-crystal, SAXS, high-pressure and other diffraction applications. The MicroMax® family of microfocus X-ray generators create high-flux, low-divergence beams offering rotating-anode-like performance from a sealed tube source Max-Flux® parallel or focusing optic retrofits are available for all brands of X-ray sources. Ovonyx™ multilayer analyzers are the original and industry standard for WDXRF spectrometry.

SGX Sensortech (MA) Ltd.
Booth: 56
Website: www.sgxsensortech.com
Email: sales.ma@sgxsensortech.com
Phone: +44 (0) 1628 533060

SGX Sensortech (formerly e2v Scientific Instruments) manufactures specialist EDXRF detectors for the OEM industrial markets and for scientific research (synchrotron, PIXE, laboratory XRF etc). We offer a full range of single and multi-element Si(Li) and SDD detector products with individual sensor active areas ranging from 7mm2 to 100mm2 active area. Additionally, SGX provides a series of digital signal processors which, together with our comprehensive detector range, are designed to satisfy the requirements of today's analytical applications.

2013 EXHIBITORS

COMPANY — EXHIBITOR PRODUCTS

Spectro Analytical Instruments
Booth: 44
Website: www.spectro.com
Email: spectro-usa.sales@ametek.com
Phone: 201.342.3000

SPECTRO Analytical Instruments is a global leader in the design and manufacturing of Energy Dispersive XRF, ICP-OES, ICP-MS and OES analyzers. SPECTRO offers a wide range of EDXRF products from handheld to multi-purpose laboratory spectrometers for a wide variety of applications. SPECTRO has just launched the SPECTROSCOUT portable XRF analyzer that enables laboratory quality analysis in remote location such as mining, geological field operations and is ideal for use in precious metal analysis. The system weighs just 26 pounds.

SPEX SamplePrep
Booth: 8
Website: www.spexsampleprep.com
Phone: 732.623.0465

For over 50 years, SPEX SamplePrep has provided superior sample preparation equipment for X-ray and XRF analysis. Our Katanax K2 Prime is an automated, electric fusion fluxer that prepares glass beads for XRF analysis. It has a throughput of 24-30 samples per hour. The X-Press is an automated, 35-ton, hydraulic laboratory press that presses sample pellets for XRF, IR in minutes. Stop by booth 8 to see our innovative equipment and ask about your tradeshow discount.

Thermo Scientific
Booths: 24, 25
Website: www.thermoscientific.com/xray
Email: analyze.us@thermofisher.com
Phone: 608.276.6100

Thermo Fisher Scientific, the world leader in serving science, offers a large variety of high-hand analytical instruments using various techniques, in particular X-ray fluorescence (WDXRF/EDXRF) and X-ray diffraction (XRD) equipment, for spectrochemical/phase analysis of all types of materials (solids, liquids, powders). Its latest innovation in XRF is the Thermo Scientific ARL OPTIM'X WDXRF analyzer designed with a new 200W X-ray tube and Ultra Closely Coupled Optics (UCCO™) to provide the highest possible performance within a short response time. Visit www.thermoscientific.com/xray

X-Bridge Technologies Co., Ltd.
Booth: 16
Website: www.xbrt.net
Email: st@xbrt.net
Phone: +81.75.622.5162

X-Bridge Technologies assists analytical X-ray instrument manufacturers' designing and producing their products. X-ray detection and signal processing electronics such as Digital Pulse Processors (DPP), preamplifiers and bias PS are supplied. Design consulting services has also been provided to multiple manufactures. Our new product 25 x 50mm DPP core named 'DPP Engine' reduces size, part cost and labor cost in your XRF spectrometer production and realizes design flexibilities of XRF / XRD.

XIA LLC
Booth: 3
Website: www.xia.com
Email: sales@XIA.com
Phone: 510.401.5760

XIA LLC develops and sells advanced signal processing solutions for X-ray and gamma-ray detectors and related instruments, including OEM, for applications in research, industry and homeland security. Our core technology is high-performance digital pulse processors, available in both flexible stand-alone and dedicated embedded configurations, as well as multi-channel configurations. From low power, handheld spectrometry through extremely high count rate applications to integrated multi-element systems, XIA provides solutions that advance the state of the art yet are affordably priced.

XOS
Booth: 36
Website: www.XOS.com
Email: info@xos.com
Phone: 518.880.1500

XOS is a provider of mission-critical materials-analysis equipment for industries and regulators that must control material quality and performance, from consumer products (e.g., toys) to electronics to the petroleum industry. XOS leverages its world leadership in X-ray optics to supply application-specific analyzers that measure environmental and product contaminants such as lead, cadmium, chlorine, and sulfur. As a supplier to the analytical-instrument companies, XOS offers X-ray optics and sub-systems to enhance analytical performance in X-ray instruments.

EVENING TECHNICAL SESSIONS & SOCIAL EVENTS

Spouses and families are welcome to attend all social functions. The Wine & Cheese Receptions and Poster Sessions will be held in the Westminster Foyer, outside the exhibit hall (Westminster Ballroom), unless noted otherwise.

Monday, 5 August 5:30 – 7:30 pm

XRD Poster Session and Wine & Cheese Reception

Sponsored by ICDD.

Tuesday, 6 August 5:30 – 7:30 pm

XRF Poster Session and Wine & Cheese Reception

Sponsored by Chemplex Industries, Inc.

Wednesday, 7 August 5:30 – 7:00 pm

Vender-Sponsored Reception held in the Exhibit Hall (Westminster Ballroom)

WORKSHOPS
MONDAY 5 AUGUST

AM Workshops 9:00 AM–12:00 PM || ***PM Workshops 1:30 PM–4:30 PM***

Monday AM

XRD

Introduction to the New GSAS-II Crystallographic Analysis System—Full Day || *Standley Ballroom II*

Organizers & Instructors:

B. Toby, R. Von Dreele, *Argonne National Laboratory, Argonne, IL, USA, brian.toby@anl.gov, vondreele@anl.gov*

The workshop will introduce the attendees to the use of the new GSAS-II software package for the reduction, solution and refinement with all types of X-ray and neutron crystallographic data. The workshop will emphasize work with powder diffraction data. All software needed to install and run the software is freely available. Attendees will be expected to bring their own laptops with the software already downloaded. The workshop will be targeted towards individuals with some experience with Rietveld analysis and to experienced single-crystal crystallographers with some knowledge of powder diffraction. Areas to be covered include use of GSAS-II for: area detector data integration, indexing patterns, structure solution by charge-flipping, and Rietveld refinement with constraints and restraints.

Basic to Intermediate XRD Analysis || *Meadowbrook*

Organizers & Instructors:

T.N. Blanton, *International Centre for Diffraction Data, Newtown Square, PA, USA, tblanton@icdd.com*

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

T.R. Watkins, *Oak Ridge National Laboratory, Oak Ridge, TN, USA*

M.A. Rodriguez, *Sandia National Laboratory, Albuquerque, NM, USA*

The use of XRD in routine qualitative and non-Rietveld quantitative analysis will be presented. The use of XRD in phase identification will be covered, including introductory remarks on sample preparation and a discussion of common XRD geometries. Next, we will cover profile fitting and lattice parameter refinement for determination of the composition of solid solutions via Vegard's law. Finally, we will cover the use of the reference intensity ratio method for semi-quantitative analysis and full quantification using the internal standard method.

XRF

Basic XRF || *Standley Ballroom I*

Organizer & Instructors:

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

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

A.R. Drews, *Ford Motor Company, Dearborn, MI, USA*

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 || *Cotton Creek*

Organizers & Instructors:

C. Streli, *TU Wien, Atominstitut, Wien, Austria, streli@ati.ac.at*

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

K. Tsuji, *Osaka City University, Osaka, Japan*

A. Martin, *Thermo Fisher Scientific, Sugarland, TX, USA*

Both beginners and experienced X-ray physicists will gain information by attending the Trace Analysis workshop. Presentations of most modern techniques and instrumentation for trace element analysis using WDXRF, EDXRS, and more will be given. Physical methods to improve minimum detection limits in XRF by background reduction will be discussed; examples of synchrotron radiation as an excitation source, as well as standard WDXRF laboratory instrumentation. Introduction to total reflection XRF (TXRF) and actual instrumentation will show achievable advantages and results in terms of detection limits, sensitivities and detectable elemental range down to light elements (e.g., Carbon). Confocal μ-XRF will be presented as a method for 2D and 3D spatial resolved elemental imaging. Applications from interesting scientific fields as environment, microelectronics, forensic, and life science will show the successful use and the importance of the various XRF spectrometric techniques. Trace analysis techniques by WDXRF – methods and pitfalls: background selection, crystal and collimator options, sample types and more will be discussed.

WORKSHOPS
MONDAY 5 AUGUST

Monday PM

XRD & XRF

X-ray Optics || *Cotton Creek*

Organizers & Instructors:

U. Fittschen, *Universität Hamburg, Hamburg, Germany, ursula.fittschen@chemie.uni-hamburg.de*
G.J. Havrilla, *Los Alamos National Laboratory, Los Alamos, NM, USA, havrilla@lanl.gov*
G. Wellenreuther, *HASYLAB at DESY, Hamburg, Germany*
M. Kraemer, *AXO Dresden GmbH, Dresden, Germany*

This workshop will focus on the different state-of-the-art focusing X-ray optics. Capillary optics, DCC-Optics, Fresnel Zone Plates, KB-mirrors and compound refractive lenses will be covered. Their capability and performance will be illustrated with examples from latest research results from laboratory-based instrumentation and synchrotron facilities. The workshop level will be appropriate for beginners and advanced beginners addressing also the underlying physical principles like refraction, diffraction and total reflection.

XRD

Introduction to the New GSAS-II Crystallographic Analysis System—Continued

Organizers & Instructors: || *Standley Ballroom II*

B. Toby, R. Von Dreele, *Argonne National Laboratory, Argonne, IL, USA, brian.toby@anl.gov, vondreele@anl.gov*

Total Pattern Analysis || *Meadowbrook*

Organizers & Instructors:

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

Total pattern analysis (TPA) is fundamentally a concept whereby all possible available information can be derived from a powder diffraction pattern. This would include the identification of all materials present in the specimen, information about the crystalline state of each material, the crystallite size, stress, strain, particle size, shape, etc. Several different approaches have been used to perform TPA analyses. One approach is to mathematically deconvolute the pattern and analyze each contributing component by using fundamental parameters and diffraction physics. This approach has been commonly used for highly crystalline materials. TPA can also be performed empirically by using simulations of digitized experimental components and this approach is frequently used for non-crystalline materials, mixtures having a noncrystalline component, or in cases where the fundamental parameters are not known. Several recent methods give the user a choice of several approaches that can be mixed depending upon the nature of the specimen being analyzed and information being sought. In this workshop we will review various methods for performing TPA analyses and discuss the fundamental strengths and weaknesses of various approaches.

XRF

Energy Dispersive XRF || *Standley Ballroom I*

Organizer & Instructors:

R. Phillips, *Thermo Scientific, West Palm Beach, FL, USA, rich.phillips@thermofisher.com*
P. Lemberge, *Thermo Scientific, Ecublens, Switzerland*
A. McWilliams, *RTI International, Research Triangle Park, NC, USA*

This workshop is designed to provide a discussion of the theoretical and practical aspects of EDXRF spectrometry providing a comprehensive review of the basic fundamentals for both the beginner and experienced X-ray spectroscopist. Topics to be covered include instrumentation, components, and applicability of EDXRF; ease of use; rapid qualitative analysis and material screening; calibration techniques for quantitative analysis; standard-less analysis; sensitivity of EDXRF for a wide variety of elements in various matrices; and sample preparation. A variety of applications will be presented as real-life examples where EDXRF is being used to solve complex analytical problems. The major emphases will be applicability of EDXRF and the optimal protocol for generating and reporting of reliable experimental results.

WORKSHOPS
TUESDAY 6 AUGUST

AM Workshops 9:00 AM–12:00 PM || ***PM Workshops 1:30 PM–4:30 PM***

Tuesday AM

XRD & XRF

Fundamentals of Digital Signal Processing and X-ray Detectors || *Standley Ballroom I*

Organizer & Instructors:

S. Hayakawa, *Hiroshima University, Hiroshima, Japan, hayakawa@hiroshima-u.ac.jp*
J. Kawai, K. Ohira, *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 explain 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 nonlinear 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.

XRD

Hands-on Rietveld Analysis || *Cotton Creek*

Organizer & Instructors:

E.A. Payzant, *Oak Ridge National Laboratory, Oak Ridge, TN, USA, payzanta@ornl.gov*
P. Zavalij, *University of Maryland, College Park, MD, USA*

Objective: Attendees will have the opportunity to refine experimental X-ray and neutron data sets. The instructors will present a series of worked examples to illustrate important issues in Rietveld refinement.

Topics to be addressed will include:

- Recommended refinement strategies
- Structure models and instrumental parameters
- How to refine: lattice parameters, site occupancy factors, thermal parameters, preferred orientation
- How to properly consider instrumental parameters
- Accuracy and precision
- Refinement indices and what they mean
- How to use the program to model a hypothetical pattern
- Quantitative analysis and amorphous content
- What to do for an incomplete structure model

Attendees are encouraged to bring laptop computers with Rietveld software installed. Data files will be provided. In the workshop, these data files will be refined using the free program GSAS with the EXPGUI, but other popular programs (FullProf, Topas, Jade, High-Score, MAUD, Rietan, etc.) will be discussed during the workshop.

Software: GSAS with EXPGUI is available from: <https://subversion.xor.aps.anl.gov/trac/EXPGUI>

Reference (optional): *Fundamentals of Powder Diffraction and Structural Characterization of Materials*, VK Pecharsky and PY Zavalij, Springer

WORKSHOPS
TUESDAY 6 AUGUST

Modeling & Analysis of Small-angle Scattering—Full Day || *Meadowbrook*

Organizer & Instructor:

B. Landes, *Dow Chemical Company, Midland, MI, USA, bglandes@dow.com*

J. Ilavsky, *Argonne National Laboratory, Argonne, IL, USA, ilavsky@aps.anl.gov*

Successful small-angle X-ray and neutron scattering (SAXS & SANS) experiments require appropriate data analysis tools. Various tools were developed over the years, for example ATSAS, mostly applicable for biological systems and NIST Analysis package for Igor Pro. For complex problems in materials science, physics, and chemistry, Igor Pro based package Irena was developed during the last 12 years at the APS. It is being widely used for support of SAXS and USAXS beamlines at the APS and number of other facilities worldwide. Six courses on how to use this package were made available to the SAXS/SANS community just during the last 12 months in the US, Australia, and Brazil. The course will be taught by the software author, Jan Ilavsky, APS staff member. The course will walk users through the use of the selected tools in this package from data import, manipulation & graphing, to different methods of analysis and export of the results. Theories behind the tools and their correct applicability to various problems will be discussed. Participants are expected to bring their computers (Windows or Mac OS). A demo version of Igor 6 will be provided to users (if needed) as well as CD with copy of the latest SAXS software version and other materials. In addition, participants are encouraged to bring their own SAXS experimental results for discussions if time is available.

About the software: Irena is a package of tools for analysis of small-angle scattering (SAXS, SANS, USAXS, USANS) data. For more details on this software package please visit: http://usaxs.xray.aps.anl.gov/staff/ilavsky/irena.html

XRF

Quantitative Analysis—Full Day || *Standley Ballroom II*

Organizer & Instructors:

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

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

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

Morning: Basic methods and resources

1. Classical fundamental parameters and mathematical models.
2. Empirical and theoretical influence coefficients.
3. Fundamental parameter collections and tube spectra: Sources, availability, and reliability.
4. A free Excel-tool for comparison of fundamental parameter data and simple computations.

See page 15 for PM session

WORKSHOPS
TUESDAY 6 AUGUST

Tuesday PM

XRD

Introduction to Volume H || *Cotton Creek*

Organizer & Instructor:

J.A. Kaduk, *Illinois Institute of Technology, Naperville, IL, USA, jkaduk@iit.edu*

A new volume of the International Tables for Crystallography, Volume H on powder diffraction is being prepared. This volume will include chapters on fundamental topics in powder diffraction, including specimen preparation, data processing, structure solution and refinement, and structure validation, as well as topical chapters on many different applications of powder diffraction. Volume H will be the first International Tables volume for which the on-line version should be considered the primary, and the print volume the secondary publication. The editors anticipate that the topical chapters will include raw data and instructions for processing, to help make Volume H the ultimate powder diffraction textbook. This workshop will detail the organization and content of the Volume, and provide a "sneak peek" at selected chapters.

Modeling & Analysis of Small-angle Scattering—Continued || *Meadowbrook*

Organizer & Instructors:

B. Landes, *Dow Chemical Company, Midland, MI, USA, bglandes@dow.com*

J. Ilavsky, *Argonne National Laboratory, Argonne, IL, USA, ilavsky@aps.anl.gov*

XRF

Sample Preparation of XRF || *Standley Ballroom I*

Organizer & Instructors:

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

M. Bouchard, *Corporation Scientifique Claisse, Quebec City, Quebec, Canada*

C. Wilson, *Wyoming Analytical, Denver, CO, USA*

This workshop will discuss fundamental physics and basic laboratory operations involved in the specimen preparation for XRF of pressed powders and fusion beads, with special sessions devoted to the preparation of iron ore, concentrates, pellets, coal and fly-ash.

Quantitative Analysis—Continued || *Standley Ballroom II*

Organizer & Instructors:

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

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

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

Afternoon: Advanced methods.

1. Compensation methods (standard addition, internal standard, heavy absorber, Compton scattering).
2. Layered materials, inhomogeneous samples, and rough surfaces.
3. Light elements. Heavy elements in a light matrix. Trace element analysis. Analysis using L- and M-lines (including Coster Kronig contributions, cascade effects).
4. Interpretation of spectra: Obtaining net intensities; artifacts.

XRD POSTER SESSION
MONDAY, 5 AUGUST

The Monday evening XRD Poster Session will be held 5:30 – 7:30 pm in the Westminster Foyer, outside the exhibit hall (Westminster Ballroom). It will be held in conjunction with a Wine & Cheese Reception sponsored by ICDD.

Chair: T.R. Watkins, *Oak Ridge National Laboratory, Oak Ridge, TN, USA*

D-5 Kinetic Study of Nanostructured $Cr_{80}Co_{20}$ Alloy by the Rietveld Refinement

S. Louidi, Université 20 Août 1955, Skikda, Algérie
F.-Z. Bentayeb, Université Badji-Mokhtar, Annaba, Algérie
J.J. Sunol, L. Escoda, Universitat de Girona, Girona, Spain

D-12 Usage of the X-ray Topography Unit for Producing High-Quality Concave Optics

J. Maj, C. Harmata, X. Huang, L. Assoufid, X-ray Science Division, Argonne, IL, USA
L. Maj, Yale University, New Haven, CT, USA
P. Fernandez, G. Navrotski, APS Engineering Support Division, Argonne, IL, USA
G. Waldschmidt, Accelerator System Division, Argonne, IL, USA
P. Chow, High Pressure Collaborative Access Team--HP-CAT, Argonne, IL, USA

D-14 Ball-Milling Effect on Size and Strain of Pt-ZrO_2 Powder

T.K. Jung, D.W. Joh, H.S. Lee, Korea Institute of Industrial Technology, Incheon, Republic of Korea
S.Y. Lee, Columbia University, New York, NY, USA

D-16 An In-Situ XRD and H_2-D_2 Exchange Study on Ni-Based Amorphous and Crystalline Membranes

A. Adibhatla, W. Chien, D. Chandra, University of Nevada, Reno, NV, USA
M.D. Dolan, CSIRO Energy Technology, Pullenvale, Queensland, Australia

D-17 The Salts of 1,2-Diaminocyclohexane and H_2PtCl_6 and Its Crystal Structures from X-ray Powder Diffraction Data

D.Y. Leshok, S.D. Kirik, Siberian Federal University, Krasnoyarsk, Krasnoyarsk Territory, Russia
R.F. Mulagaleev, A.K. Starkov, Institute of Chemistry and Chemical Technology SB RAS, Krasnoyarsk, Krasnoyarsk Territory, Russia

D-21 Optical Elements for Analytical X-ray Applications

B. Hasse, J. Graf, F. Hertlein, J. Wiesmann, C. Michaelsen, Incoatec GmbH, Geesthacht, Germany

D-24 Improvement of Surface and Interface Roughness Estimation on X-ray Reflectivity Analysis

Y. Fujii, Kobe University, Kobe, Japan

D-27 Combining Reflection / Transmission Measurements to Eliminate Preferred Orientation

S. Bates, Triclinic Labs, Inc., West Lafayette, IN, USA
A. Takase, Rigaku Americas Corporation, The Woodlands, TX, USA

D-33 In-Plane $\sin^2\psi$ Technique for Laboratory High-Temperature Characterization of Residual Stresses

J. Todt, J. Keckes, University of Leoben and Erich Schmid Institute for Materials Science, Austrian Academy of Sciences, Leoben, Austria
K. Asao, K. Arai, T. Ozawa, K. Saito, Rigaku Corporation, Tokyo, Japan

D-44 Practical Methods in Thin Film Analysis by X-ray Reflectivity

J. Li, Rigaku Americas Corporation, The Woodlands, TX, USA

D-50 Synthesis and Crystal Structural Study of Indium-Scandium-Titanium Oxide: A New Transparent Quaternary Compound

V.E. Alvarez-Montaño, F. Brown, N. Kimizuka, G.T. Munive, Universidad de Sonora, Sonora, México

XRD POSTER SESSION
MONDAY, 5 AUGUST

D-52 X-RAY DIFFRACTION EXPERIMENTS FOR UPPER-LEVEL UNDERGRADUATE LABORATORIES

H.A. Conrad, C. Molina, T.D. Golden, University of North Texas, Denton, Texas, USA

D-53 X-RAY DIFFRACTION STUDY FOR THE COMPARISON OF STANDARD AND SYNTHESIZED CALIBRATION MATERIALS FOR HUMAN BONE

V.H. DeLeon, T.D. Golden, University of North Texas, Denton, Texas, USA

D-56 NEW FORMS OF THIOCOLCHICOSIDE, AN ANTI-INFLAMATORY AND ANALGESIC MUSCLE RELAXANT

A. Dugarte, R. Toro, J. Contreras, G. Díaz de Delgado, J.M. Delgado, Universidad de Los Andes, Mérida, Venezuela

D-59 THE BIG PICTURE OF THE VERY SMALL—A GALLERY OF SAXS MEASUREMENTS ON NANO-MATERIALS

M. Fernandez-Martinez, P. Panine, S. Rodrigues, B. Lantz, R. Mahe, F. Bossan, P. Høghøj, Xenocs, Sassenage, France

D-61 APPLICABILITY OF TRADITIONAL DATA ANALYSIS METHODS TO DIFFRACTION PROFILES FROM NANOMATERIALS

H. Öztürk, I.C. Noyan, Columbia University, New York, NY, USA
H. Yan, NSLS II, Brookhaven National Laboratory, Upton, NY, USA

D-63 IN-SITU X-RAY AND NEUTRON CHARACTERIZATION OF SPINEL-SUPPORTED NANOPARTICULATE METAL CATALYSTS

S.T. Misture, Alfred University, Alfred, NY, USA

D-64 CHARACTERIZATION OF RECRYSTALLIZATION KINETICS USING COMPLEMENTARY TECHNIQUES

M. Treger, I.C. Noyan, Columbia University, New York, NY, USA
C. Witt, Global Foundries, Yorktown Heights, NY, USA
R. Rosenberg, C. Murray, J. Jordan-Sweet, IBM Research Division, Yorktown Heights, NY, USA
C. Cabral, IBM Microelectronics Division, Yorktown Heights, NY, USA
E. Eisenbraun, University at Albany-SUNY, Albany, NY

D-68 NEW DOUBLE AND TRIPLE ALKALI METAL - CHALCOGENIDE LAYERED PEROVSKITES

D.M. Montasserasadi, J.B. Wiley, UNO, New Orleans, LA, USA

D-69 X-RAY OPTICS AND PRECISION REQUIREMENTS FOR RESIDUAL STRESS ANALYSES WITH HIGH SPATIAL RESOLUTION

WITHDRAWN

B. Eigenmann, X-ray an[illegible] Eigenmann, Hormersdorf, Germany

D-70 ICDD AND ASM DATABASE SURVEY OF THE THERMOELECTRIC HALF-HEUSLER MATERIAL SYSTEMS

W. Wong-Ng, National Institute of Standards and Technology, Gaithersburg, MD, USA
J. Yang, University of Washington, Seattle, WA, USA

D-76 STRUCTURAL AND THEORETICAL STUDIES OF $[(MX)_{1+Y}]_M[TX_2]_N$ THIN FILM FERECRYSTALS

M. Dolgos, Oregon State University, Corvallis, OR, USA
R. Atkins, D. Johnson, University of Oregon, Eugene, OR, USA
B. Hanken, M. Asta, University of California, Berkley, CA, USA

D-78 CRYSTAL STRUCTURE AND PHOTOCATALYTIC STUDIES OF 2, 3, 4, AND 5-LAYER AURIVILLIUS OXIDES

J. Shi, J. Liu, V. Blair, S.T. Misture, Alfred University, Alfred, NY, USA

D-80 CANDI-X, SWEET PROGRESS WITH A FULL PATTERN SEARCH APPROACH

T. Degen, E. Bron, PANalytical B.V., Almelo, The Netherlands
A. Renshaw, Oxford Cryosystems, Long Hanborough, Oxfordshire United Kingdom

XRD POSTER SESSION
MONDAY, 5 AUGUST

Monday Post Deadline Posters

D-82 Combined X-ray and Neutron Diffraction Study of Mo_5Re_2Si Sigma Phase

E.A. Payzant, J.H. Schneibel, ORNL, Oak Ridge, TN, USA

D-83 Investigation of Synthesis Parameters on Growth of Semiconducting Nanoparticles

A. Pein, C. Resch, Anton Paar, Graz, Styria, Austria

D-84 Diffracted Beam Collimators – Extending the Range of Applications for 2D Detectors

D. Beckers, M. Fransen, PANalytical B.V., Almelo, The Netherlands

D-86 X-ray Diffraction Identification of F[illegible]y Acids and their Mixtures in Homologous Series $C_NH_{2N}O_2$ (n = 1 [illegible]

WITHDRAWN

J.M. Trushkina, E.N. Kotelnikova, St. Petersburg State University, St. Petersburg, Russia

D-87 X-ray Microbeam Diffraction Study of Electrochemically and Chemically Delithiated Li_xCoO_2 Single Crystals

Q. Lin, Y. Liu, J. Mitchell, Materials Science Division, Argonne National Laboratory, Argonne, IL, USA
S.-N. Hsiao, X. Ruqing, N. Kara, M. Balasubramanian, T.-Y. Tien, Advanced Photon Source, Argonne National Laboratory, Argonne, IL, USA

D-88 Structural and Thermal Equilibrium Studies of Pentaglycerine and Tris(hydroxymethyl)aminomethane Binary System

R. Shi, W. Chien, D. Chandra, University of Nevada, Reno, Reno, Nevada, USA

D-89 Study of High Temperature Phase of Titanate Nanotubes

T. Brunatova, S. Danis, R. Kuzel, Charles University, Prague, Czech Republic
D. Popelkova, Academy of Sciences of the Czech Republic, Prague, Czech Republic
P. Oleynikov, X. Zou, Stockholm University, Stockholm, Sweden

D-90 Structural Characterization of New Ternary Yttrium–Rare Earth Sesquioxides Formed by the Sol–Gel Technique

G. Rafailov, I. Dahan, Z. Porat, Nuclear Research Center, Negev, Beer-Sheva, Israel
G. Kimmel, D. Moglyanski, Ben-Gurion University of the Negev, Beer-Sheva, Israel

D-91 Analytical Calculation of the Radius of Gyration of Polyhedra and Platonic Solids in Small-Angle Scattering

M. Kriechbaum, Graz University of Technology, Graz, Austria

D-93 GISAXS Investigations of Inorganic Nanostructures Using A Multipurpose Laboratory System

M. Fransen, M. Gateshki, PANalytical B.V., Almelo, The Netherlands
P. Kidd, G. Tye, PANalytical Research Centre, SINC University of Sussex, Brighton, UK

XRD POSTER SESSION
MONDAY, 5 AUGUST

D-94 CHEMIN, THE XRD INSTRUMENT ONBOARD THE CURIOSITY ROVER–DESIGN AND FIRST RESULTS FROM MARS

P. Sarrazin, SETI Institute, Mountain View, CA and Olympus-NDT, Waltham, MA
D. Blake, T. Bristow, D. Des Marais, M. Wilson, NASA ARC, Moffett Field, CA
D. Bish, Indiana University, Bloomington, IN
D. Vaniman, Planetary Science Institute (PSI), Tucson, AZ
S. Chipera, CHK Energy, Oklahoma City, OK
D. Ming, R. Morris, E. Rampe, N. Spanovich, NASA JSC
R. T. Downs, S. Morrison, University of Arizona, Tucson Arizona
A. Treiman, Lunar and Planetary Institute (LPI), Houston, TX
A. Yen, J. Crisp, J.M. Morookian, R. Anderson, Jet Propulsion Lab (JPL), Pasadena, CA
J. Grotzinger, E. Stolper, Caltech, Pasadena, CA
C. Achilles, ESCG/Hamilton Sundstrand, Houston, TX
J. Farmer, Arizona State University, Tempe, AZ
M. Gailhanou, CNRS, Marseille, France
And the MSL Science Team

D-95 A NEW MULTI-SAMPLE HUMIDITY STAGE FOR TRANSMISSION-XRD, USED TO STUDY THE CRYSTALLIZATION OF SPRAY-DRIED SALBUTAMOL

C. Resch, A. Pein, Anton Paar GmbH, Graz, Austria
S. Zellnitz, N. Urbanetz, Research Centre Pharmaceutical Engineering (RCPE), Graz, Austria

D-96 STRUCTURE CHANGES OF TITANATE NANOTUBES UNDER HIGH PRESSURE

H. Xu, H. Konishi, University of Wisconsin, Madison, WI, USA
D. He, Los Alamos National Laboratory, Los Alamos, NM, USA
Y. Jiang, University of New Mexico, New Mexico, USA

D-97 NIST STANDARD REFERENCE MATERIALS FOR X-RAY METROLOGY

J.P. Cline, M. Mendenhall, D. Windover, A. Henins, NIST, Gaithersburg, MD, USA

XRF POSTER SESSION
TUESDAY, 6 AUGUST

The Tuesday evening XRF Poster Session will be held 5:30 – 7:30 pm in the Westminster Foyer, outside the exhibit hall (Westminster Ballroom). It will be held in conjunction with a Wine & Cheese Reception sponsored by Chemplex Industries, Inc.

Chairs: R. Van Grieken, *University of Antwerp, Antwerp, Belgium*
M.A. Zaitz, *IBM, Hopewell Junction, NY, USA*

C-4 KETEK Silicon Drift Detectors with ASIC and Readout Electronics

A. Pahlke, M. Bachmann, T. Eggert, R. Fojt, M. Fraczek, L. Höllt, J. Knobloch, C. Luckey, N. Miyakawa, S. Pahlke, J. Rumpff, O. Scheid, A. Simsek, R. Stötter, I. Wennemuth, F. Wiest, KETEK GmbH, Munich, Germany

C-6 Factors Influencing Characteristics of Powder Sample Prepared for X-ray Emission Spectrometry

N. Radovic, University of Zagreb, Faculty of Geodesy, Zagreb, Croatia
F. Šafar, Steel and Pipe Work, Sisak, Croatia

F-5 Trace Metal Pollution Assessment and Distribution in Soils Using ED-XRF Spectrometry

K. Kodom, Radford University College, East-Legon, Accra, Ghana
K. Preko, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
D. Boamah, Geochemistry & Laboratories, Geological Survey Department, Accra, Ghana

F-9 Characterizing Fundamental Parameters Based Analysis for Soil-ceramic Matrices in Polarized Energy Dispersive X-ray Fluorescence Spectrometry (pEDXRF)

W.A. Abuhani, L.M. Villaseñor Cendejas, Institute of Physics and Mathematics, Morelia, Michoacan, Mexico
N. Dasgupta-Schubert, Institute of Chemical Biology, Morelia, Michoacan, Mexico

F-10 Examining Elemental Distributions in Three Dimensions Using Two-Dimensional Micro-XRF Imaging

C.G. Worley, P.T. Martinez, K.J. Kuhn, L. Tandon, Los Alamos National Laboratory, Los Alamos, NM, USA

F-18 Absorption of the Primary Beam in Sr-TXRF Analysis: Experimental Visualization Using a Color X-ray Camera

M. Menzel, U.E.A. Fittschen, Chemistry Department, University of Hamburg, Hamburg, Germany
O. Scharf, IfG Institute for Scientific Instruments GmbH, Berlin, Germany
M. Radtke, Uwe Reinholz, BAM Federal Institute of Materials Research and Testing, Berlin, Germany

F-23 Long Term Inter-Instrumental EDXRF Comparison on the Measurements of PM2.5 Samples Collected in IMPROVE (Interagency Monitoring of Protected Visual Environments) at Crocker Nuclear Laboratory, UC Davis

K. Trzepla, S. Yatkin, University of California, Davis, CA, USA

F-25 Signal Processors Parameter Setting Effect on the Solid State Detector Tailing

T. Papp, J.A. Maxwell, Cambridge Scientific, Guelph, ON, Canada

F-27 The Ideal Specimen for Total Reflection X-ray Fluorescence (TXRF) Analysis: Results from Simulations and Experimental Evaluation

U.E.A. Fittschen, M. Menzel, Chemistry Department University of Hamburg, Hamburg, Germany
O. Scharf, IfG Institute for Scientific Instruments GmbH, Berlin, Germany
M. Radtke, U. Reinholz, G. Buzanich, BAM Federal Institute of Materials Research and Testing, Berlin, Germany
C. Horntrich, C. Streli, Atominstitut, TU Wien, Vienna, Austria
V. Montoya, K. McIntosh, G. Havrilla, Los Alamos National Laboratory, Los Alamos, NM, USA

XRF POSTER SESSION
TUESDAY, 6 AUGUST

F-28 Determination of Iodine in Dietary Supplements Using Total Reflection X-ray Fluorescence

U.E.A. Fittschen, C. Wontorra, Chemistry Department, University of Hamburg, Hamburg, Germany
H. Stosnach, Bruker Nano, Berlin, Germany

F-30 Investigation on the Ni Oxidation State in $LiNi_{0.5}Mn_{1.5}O_4$ Li-ion Battery Cathodes at Different Cycle States: Pristine, Discharged, After Quick Charging and Slow Charging

U.E.A. Fittschen, M. Menzel, A. Schlifke, M. Froeba, Chemistry Department, University of Hamburg, Hamburg, Germany
U. Boesenberg, DESY Deutsches Elektronen Synchrotron, Hamburg, Germany
M. Falk, J. Janeck, Chemistry Department, University of Giessen, Giessen, Germany

F-31 MTCA.4 Platform Based Digital Pulse Processor for Demanding Spectroscopy Experiments

E. Janezic, S. Bucik, A. Bardorfer, B. Baricevic, R. Hrovatin, Instrumentation Technologies, Slovenia

F-36 Measurement of PM_{10} Loaded Filters Using Standardless EDXRF Analysis and Linear Calibration: An Inter-Laboratory Comparison

S. Yatkin, K. Trzepla, Crocker Nuclear Laboratory, University of California, Davis, CA, USA
M. Gerboles, C.A. Belis, European Commission, Joint Research Centre, Institute for Environment and Sustainability, Ispra, Italy

F-45 Distribution of S, Ca, Fe and Zn in Human Osteosarcoma Tissue Determined with Synchrotron and Laboratory M-XRF Analysis

B. Pemmer, S. Smolek, C. Weixelbaumer, M. Foelser, M. Rauwolf, A. Maderitsch, P. Wobrauschek, C. Streli, Vienna University of Technology, Atominstitut, Vienna, Austria
A. Roschger, P. Roschger, K. Klaushofer, Hanusch Hospital, Vienna, Austria
R. Simon, Karlsruhe Inst. of Tech., Inst. for Synchrotron Radiation, Eggenstein-Leopoldshafen, Germany
S. Lang, R. Windhager, J. Hofstaetter, Vienna General Hospital, Medical Univ. of Vienna, Austria

F-46 Characterization of Thin Films on Si Wafers by GIXRF in Combination with XRR

M. Schiebl, D. Ingerle, C. Streli, P. Wobrauschek, Vienna Univ. of Technology, Atominstitut, Vienna, Austria

F-48 A Simulation Model for Confocal Micro-XRF of Layer Structures

C. Huber, S. Smolek, C. Streli, P. Wobrauschek, Vienna Univ. of Technology, Atominstitut, Vienna, Austria

F-49 Preparation of Reference Materials of Lead (Pb) and Silicon (Si) for XRF Analysis of Ambient Particulate Matter

H.S. Amin, S. Yatkin, K. Trzepla, A.M. Dillner, IMPROVE Program, Crocker Nuclear Laboratory, University of California, Davis, CA, USA

F-52 Moxtek MXDPP-50: Functionality and Performance Characterizations

S. Cornaby, S. Ogden, C. Carter, K. Decker, Moxtek, Orem, UT, USA

F-54 X-ray Fluorescence Instrumentations for Rapid Detection and Discrimination of Forensic Fragments at SPring-8 BL05SS

S. Hayakawa, K. Momosaki, E. Tsuji, T. Takiguchi, Hiroshima University, Hiroshima, Japan
K. Nakano, S. Takano, T. Niomiya, SPring-8, Hyogo, Japan

XRF POSTER SESSION
TUESDAY, 6 AUGUST

F-55 New Investigations with Nanogram Multi-Element Reference Samples for XRF and TXRF Analysis

M. Krämer, R. Dietsch, T. Holz, D. Weißbach, AXO DRESDEN GmbH, Dresden, Germany
B. Beckhoff, P. Hönicke, Physikalisch-Technische Bundesanstalt (PTB), Berlin, Germany
G. Falkenberg, HASYLAB at DESY, Hamburg, Germany
U.E.A. Fittschen, University of Hamburg, Hamburg, Germany
M. Radtke, R. Simon, BAM, Berlin, Germany & FIZ Karlsruhe, Karlsruhe, Germany

F-56 Forensic Investigations with Different Confocal Micro-XRF Spectrometers

S. Smolek, C. Streli, P. Wobrauschek, Vienna Univ. of Technology, Atominstitut, Vienna, Austria
T. Nakazawa, K. Nakano, K. Tsuji, Osaka City University, Sumiyoshi, Osaka, Japan

F-57 HIRX Performance in the Characterization of Plutonium

G.J. Havrilla, V.M. Montoya, K. McIntosh, H. Boukhalfa, Los Alamos National Laboratory, Los Alamos, NM, USA

F-65 Fast Elemental Imaging by Wavelength Dispersive X-ray Fluorescence Imaging Spectrometer

T. Ohmori, S. Emoto, Osaka City University, Osaka, Japan
S. Kato, M. Doi, T. Shoji, Rigaku Co., Takatsuki, Osaka, Japan
K. Tsuji, Osaka City University, Osaka, Japan

F-66 Underfilm Corrosion Process of Steel Sheets Observed by Confocal Micro XRF Technique

K. Akioka, T. Doi, M. Arai, Nippon Steel & Sumitomo Metal Corporation, Amagasaki, Hyogo, Japan
T. Nakazawa, K. Tsuji, Osaka City University, Sumiyoshi-ku Osaka, Japan

Tuesday Post Deadline Posters

F-74 Experimental Study on the Energy Dependence of Photoionization Cross-Section Ratios in Subshells Using an EDX SPECTROMETER

M. Doi, N. Kawahara, S. Hara, M. Mantler, Rigaku Corporation, Osaka, Japan

F-76 Possibility of Identifying Naturally-Occurring Heavy Metals by Combination of XRF Analysis and Leaching Tests

M. Zhang, M. Hoshino, J. Hara, Geological Survey of Japan, AIST, Tsukuba, Japan

2013 ORAL SESSIONS
WEDNESDAY AM

Plenary Session: The 100th Anniversary of X-ray Spectroscopy || *Standley Ballroom*

Chair: G.J. Havrilla, *Los Alamos National Laboratory, Los Alamos, NM, USA*

9:00 Chairman of the Denver X-ray Conference Opening Remarks

W. Tim Elam, *University of Washington APL, Seattle, WA, USA*

Presentation of Awards

2013 Barrett Award presented to Vaclav Petricek *Institute of Physics, Academy of Sciences of the Czech Republic, Praha, Czech Republic*

Presented by James Kaduk *Poly Crystallography Inc. & Illinois Institute of Technology, Naperville, IL*

2013 Jenkins Award presented to Rene van Grieken *University of Antwerp, Antwerp, Belgium*

Presented by W. Tim Elam, *University of Washington APL, Seattle, WA, USA*

2013 Jerome B. Cohen Student Award **The winner will be announced at the session.**

Presented by Cev Noyan, *Columbia University, New York, NY, USA*

2013 Hanawalt Award presented to Robert B. Von Dreele *Argonne National Laboratory, Lemont, IL, USA*

Presented by Scott Misture, *New York State College of Ceramics at Alfred University, Alfred, NY, USA*

Plenary session Remarks by the Chair

Invited Talks:

9:30 F-68 WDX: From Roentgen to Moseley to Bragg to Sherman to Jenkins

John A. Anzelmo, Anzelmo & Associates, Inc., Madison, WI, USA

10:15 Break

10:45 F72 The Electronic Age - EDX and Other Modern Techniques to the Present and Beyond

Michael Mantler, Rigaku Corporation, Purkersdorf, Austria

11:30 D-74 Hanawalt Award lecture: Protein Polycrystallography

Robert B. Von Dreele, Argonne National Laboratory, Lemont, IL, USA

WEDNESDAY PM

XRD & XRF

New Developments in XRD & XRF Instrumentation || *Standley Ballroom I*

Chairs: T. Fawcett, *International Centre for Diffraction Data, Newtown Square, PA, USA, fawcett@icdd.com*
T.N. Blanton, *International Centre for Diffraction Data, Newtown Square, PA, USA, tblanton@icdd.com*

1:15 C-9 Real-time Monitoring of Process Stream Mineralogy and Elemental Composition with the XRDF System

J.N. O'Dwyer, J.R. Tickner, G.J. Roach, CSIRO, Sydney, NSW, Australia

1:30 C-12 Real-time Dual Quantitative Elemental and Mineralogical Analysis of Gas Bearing Shale

T.C. Jennison, B. Boyer, W. Brunner, Olympus NDT, Campbell, CA, USA

1:45 F-38 New Desktop Type XRF for On-Site Elemental Analysis

D. Matsunaga, K. Nishikata, T. Aoyama, S. Ohzawa, A. Kira, S. Komatani, HORIBA Ltd., Kyoto, Japan

2:00 F-12 TRACE ELEMENT ANALYSIS IN GEOLOGICAL, COAL, AND COKE SAMPLES USING EDXRF

J. Heckel, D. Sachtler, D. Wissmann, SPECTRO Analytical Instruments GmbH, Kleve, Germany
M. Daniel-Prowse, M. DeLeon, SPECTRO Analytical Instruments Inc, Mahwah, NJ, USA

2:15 C-3 150 MM² SILICON DRIFT DETECTOR MODULES

A. Pahlke, M. Bachmann, T. Eggert, R. Fojt, M. Fraczek, L. Höllt, J. Knobloch, N. Miyakawa, S. Pahlke, J. Rumpff, O. Scheid, A. Simsek, R. Stötter, I. Wennemuth, F. Wiest, KETEK GmbH, Munich, Germany

2:30 C-14 THE NEXT GENERATION: HIGHSCORE PLUS V4.0

T. Degen, E. Bron, M. Sadki, PANalytical B.V., Almelo, The Netherlands

2:45 BREAK

3:15 D-58 THE INSIDE VIEW ON NANO-MATERIALS WITH THE XEUSS SAXS-WAXS SYSTEM

P. Panine, M. Fernandez-Martinez, S. Rodrigues, B. Lantz, R. Mahe, F. Bossan and P. Høghøj, Xenocs, Sassenage, France

3:30 D-30 THE N8 HORIZON FOR DEDICATED SAXS, WAXS, AND GISAXS

B. Jones, J. Giencke, B. He, H. Ress, Bruker AXS, Madison, WI, USA
G. Vanhoyland, K. Erlacher, Bruker AXS, Karlsruhe, Germany

3:45 C-11 MOXTEK'S NEW 60 KV, 12W X-RAY SOURCE: PERFORMANCE CHARACTERIZATIONS

S. Cornaby, E. Miller, R. Steck, K. Kozaczek, S. Kamtekar, Moxtek, Orem, UT, USA

4:00 D-20 THE VERSATILITY OF THE INCOATEC MICROFOCUS SOURCE

B. Hasse, A. Kleine, J. Graf, J. Wiesmann, C. Michaelsen, Incoatec GmbH, Geesthacht, Germany

4:15 D-10 LOW COST ROLLED X-RAY PRISM LENSES TO INCREASE PHOTON FLUX DENSITY IN DIFFRACTOMETRY EXPERIMENTS

H. Vogt, A. Last, J. Mohr, F. Marschall, M. Kluge, V. Nazmov, Karlsruhe Institute of Technology (KIT) / Institute of Microstructure Technology, Karlsruhe, Baden-Württemberg, Germany
K.-U. Mettendorf, R. Eisenhower, Bruker AXS GmbH, Karlsruhe, Baden-Württemberg, Germany

4:30 D-18 A NOVEL X-RAY DETECTOR FOR IN-HOUSE XRD

T. Taguchi, K. Matsushita, T. Sakumura, Y. Tsuji, T. Nagayoshi, Y. Nakaye, RIGAKU Corporation, Akishima, Tokyo, Japan

4:45 D-79 SCATTERX^{78} - A HIGH-PERFORMANCE SAXS/WAXS MODULE INTEGRATED ON A MULTI-PURPOSE X-RAY DIFFRACTOMETER PLATFORM

J. Bolze, M. Fransen, PANalytical B.V., Almelo, The Netherlands
V. Kogan, DANNALAB B.V., Enschede, The Netherlands

XRD

HIGH ENERGY XRD || *Cotton Creek*

Chair: J. Almer, *APS, Argonne National Laboratory, Argonne, IL, USA, almer@aps.anl.gov*

1:30 D-75 INVITED—HIGH ENERGY X-RAY DIFFRACTION MICROSCOPY: DIRECT OBSERVATION OF 3D MATERIALS RESPONSE

J. Lind, R.M. Suter, Carnegie Mellon University, Pittsburgh, PA, USA

2:00 D-49 INVITED—A NEW HIGH ENERGY X-RAY STATION AT THE CORNELL HIGH ENERGY SYNCHROTRON SOURCE

M.P. Miller, B. Oswald, M. Koker, J. Brock, E. Fontes, Cornell High Energy Synchrotron Source, Ithaca, NY USA
J. Schuren, Air Force Research Laboratory, Wright Patterson AFB, OH, USA
P. Ko, Applied and Engineering Physics, Cornell University, Ithaca, NY, USA

2:30 D-46 In Situ Characterization of Grade 92 Steel During Tensile Deformation Using High Energy X-ray Diffraction and Small Angle X-ray Scattering

L. Wang, M. Li, J. Almer, Argonne National Laboratory, Lemont, IL, USA

2:50 D-48 Understanding Cyclic Plasticity and Fatigue Using High Energy X-ray Diffraction and Crystal-Based Finite Element Models

M. Obstalecki, S.L. Wong, P.R. Dawson, M.P. Miller, Cornell University, Ithaca, NY, USA

3:10 Break

3:30 D-77 Invited—A Combined Approach to Mapping Orientations, Strains, and Voids/Cracks/Inclusions During Loading Using High Energy X-rays

J. Almer, Argonne National Laboratory, Argonne, IL, USA
J.C. Schuren, AFRL, Wright-Patterson Air Force Base, OH, USA

4:00 D-67 Decomposition of the Alpha"/Beta Duplex-Phase Microstructure During Continuous Heating of a Near-Beta Titanium Alloy

P. Barriobero-Vila, F. Warchomicka, G. Requena, Institute of Materials Science and Technology, Vienna University of Technology, Vienna, Austria
M. Stockinger, Böhler Schmiedetechnick GmbH & Co KG, Kapfenberg, Austria
N. Schell, A. Stark, Institute of Materials Research, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany
T. Buslaps, ID15, European Synchrotron Radiation Facility, Grenoble, France

4:20 D-47 Understanding Slip Processes in Silicon Using High Energy X-rays

D.C. Pagan, M.P. Miller, Cornell University, Ithaca, NY, USA

XRF

Quantitative Analysis || *Standley Ballroom II*

Chair: L.L. Brehm, *Dow Chemical Company, Midland, MI, USA, llbrehm@dow.com*

1:30 F-7 Invited—Quantitative Analysis of Ambient and Source Air Filters

S.D. Kohl, J.G Watson, J.C Chow, Desert Research Institute, Reno, NV, USA

2:00 F-17 Invited—Studies Using TXRF for Analysis of Aerosols Containing Nanoparticles with Designed Shapes and Those Produced From Fabric Testing

U.E.A. Fittschen, M. Menzel, L. Eggers, Institute of Inorganic and Applied Chemistry, University of Hamburg, Hamburg, Germany

2:30 F-59 Trace Analysis for Metals in Nail Polish by Wavelength Dispersive X-ray Fluorescence (WDXRF)

A.C. McWilliams, M.A. Levine, F.X. Weber, K.E. Levine, Research Triangle Institute, Research Triangle Park, NC, USA
A.A. Martin, Thermo Fisher Scientific, Sugarland, TX, USA

2:50 F-15 Revisit of Forensic Analysis of Arsenic Poisoning Case 1998

J. Kawai, Department of Materials Science and Engineering, Kyoto University, Kyoto, Japan

3:10 Break

3:30 F-8 Invited—Evaluation of Fundamental Parameters for Quantitative X-ray Fluorescence of Polyolefins

D. Burns, M. Wright, S. Yusuf, Dow Chemical, Midland, MI, USA

4:00 F-39 Comparison of Calculation Methods for Analysis of Soil Samples

M. Cameron, A. Seyfarth, Bruker, Kennewick, WA, USA

WEDNESDAY PM CONTINUED

4:20 F-24 NECESSARY CONDITIONS FOR ROBUST FUNDAMENTAL PARAMETER ANALYSIS IN EDXRF

T. Papp, J.A. Maxwell, Cambridge Scientific, Guelph, ON, Canada

4:40 F-22 USE OF SURROGATE MODEL ELEMENTS FOR ACCURATE PLUTONIUM QUANTIFICATION WITH HIRX

K.G. McIntosh, G.J. Havrilla, Los Alamos National Laboratory, Los Alamos, NM, USA

THURSDAY AM

XRD & XRF

APPLICATIONS OF XRD & XRF IN THE PETROLEUM INDUSTRY || *Standley Ballroom II*

Chairs: A. Doyle, *Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Rio de Janeiro, Brazil, doyle@puc-rio.br*
D.E. Simon, *DES Consulting, Bartlesville, OK, USA, desconsulting@sbcglobal.net*
R.W. Morton, *Phillips 66, Bartlesville, OK, USA, bob.morton@p66.com*

9:00 F-3 INVITED—DETERMINATION OF CHLORINE IN CRUDE OIL BY ENERGY DISPERSIVE X-RAY FLUORESCENCE SPECTROMETRY

R.Q. Aucelio, A. Doyle, Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, Brazil

9:30 F-34 BENEFITS USING WDXRF FOR PROCESS CONTROL IN POLYMER PRODUCTION: THE ACCURATE ANALYSIS OF IMPURITIES AND ADDITIVES IN PE AND PP

A. Buman, D. Pecard, Bruker AXS, Madison, WI, USA
K. Behrens, A. Bühler, F. Portala, Bruker GmbH, Karlsruhe, Germany

9:50 F-60 ADVANCED GEOLOGICAL APPLICATIONS USING WDXRF ELEMENTAL MAPPING/SMALL SPOT ANALYSIS AND STANDARDLESS QUANTIFICATION

A. Martin, Thermo Fisher Scientific, Sugarland, TX, USA
D. Bonvin, K. Juchli, Thermo Fisher Scientific, Ecublens, Switzerland
A.C. McWilliams, Research Triangle Institute, Research Triangle Park, NC, USA

10:10 F-63 INVITED—SOME APPLICATIONS OF XRF IN THE PETROLEUM INDUSTRY

A. Saavedra, Petrobras, Rio de Janeiro, RJ, Brazil

10:40 BREAK

11:00 D-72 INVITED—CRYSTALLITE DOMAIN SIZE AND THE LONG-RANGE ORDER INDEX

R.W. Morton, Phillips 66 Company, Bartlesville, OK, USA
D.E. Simon, DES Consulting, Bartlesville, OK, USA

11:30 D-73 DETERMINATION OF BA/SR RATIO IN THE BARITE/CELESTITE SOLID SOLUTION SERIES

D.E. Simon, DES Consulting, Bartlesville, OK, USA
R.W. Morton, Phillips 66 Company, Bartlesville, OK, USA

XRD

STRESS ANALYSIS || *Cotton Creek*

Chairs: D. Brown, *Los Alamos National Laboratory, Los Alamos, NM, USA, dbrown@lanl.gov*
T.R. Watkins, *Oak Ridge National Laboratory, Oak Ridge, TN, USA, watkinstr@ornl.gov*

8:00 D-36 INVITED—HIGH-ENERGY X-RAY STUDIES OF MICROSTRUCTURE AND STRAIN EVOLUTION UNDER THERMO-MECHANICAL DEFORMATION

J. Almer, P. Kensei, J. Okasinski, Argonne National Laboratory, Argonne, IL, USA

8:30 D-51 A Method to Measure 3D Residual Stress Fields Using High Energy X-rays and a Finite Element Discretization

M.P. Miller, P.R. Dawson, J.-S. Park, K. McNelis, Cornell University, Ithaca, NY, USA
U. Lienert, Deutsches Elektronen-Synchrotron, Hamburg, Germany
J.C. Williams, The Ohio State University, Columbus, OH, USA

8:50 D-65 Ductility of Beryllium Subjected to Shear-Compression Investigated Using Synchrotron X-ray Diffraction

T.A. Sisneros, D. Brown, B. Clausen, C. Cady, G.T. Gray III, E. Tulk, Los Alamos National Laboratory, Los Alamos, NM, USA
J. Almer, Argonne National Laboratory, Argonne, IL, USA

9:10 D-55 Spatially Resolved Residual Strains and Stresses in As-Fabricated Nuclear Fuel Plates

M.A. Okuniewski, Idaho National Laboratory, Idaho Falls, ID, USA
D.W. Brown, E. Tulk, B. Clausen, L. Balogh, Los Alamos National Laboratory, Los Alamos, NM, USA
J. Almer, J. Okasinski, Argonne National Laboratory, Argonne, IL, USA

9:30 D-11 Sub-Micronic Phase, Strain and Texture in Depth Gradient Measurement in Polycrystalline Thin Film: A Nano-Pencil Beam Diffraction Approach

N. Vaxelaire, P. Gergaud, CEA,LETI, Grenoble, France
G.B.M. Vaughan, European Synchrotron Radiation Facility, Grenoble, France

9:50 D-23 Phase Reversion during Compressive Loading of Shocked Alpha/Omega Zirconium

B. Clausen, Lujan Center, Los Alamos National Laboratory, Los Alamos, NM, USA
E. Tulk, E. Cerreta, J.P. Escobedo-Diaz, T.A. Sisneros, D.W. Brown, MST-8, Los Alamos National Laboratory, Los Alamos, NM, USA
J. Almer, Advanced Photon Source, Argonne National Laboratory, Argonne, IL, USA

10:10 Break

10:40 D-66 Invited—Grinding Burn - A Residual Stress Problem

B. Eigenmann, X-ray and Materials Laboratory Eigenmann, Schnaittach - Hormersdorf, Germany

11:10 D-13 The Generalized $\sin^2\psi$ Method: An Advanced Solution for X-ray Stress Analysis in Textured Materials

A. Haase, M. Klatt, A. Schafmeister, R. Stabenow, GE Sensing & Inspection Technologies GmbH, SEIFERT Analytical X-ray, Ahrensburg, Germany
B. Ortner, Montan Universität, Leoben, Austria

11:30 D-43 Residual Stress and Quantitative Phase Mapping on Complex Geometries

M. Allahkarami, J.C Hanan, Oklahoma State University, OK, USA

Pair Distribution Function || *Meadowbrook*

Chair: L. Ehm, *Stony Brook University—Mineral Physics Institute, Stony Brook, NY, USA and Brookhaven National Laboratory, Upton, NY, USA, lars.ehm@stonybrook.edu*

9:00 D-22 Invited—Application of Pair Distribution Function Analysis in Environmental Nanoscience

F.M. Michel, Virginia Tech, Blacksburg, VA, USA

9:30 D-26 Invited—High Pressure Investigations of Liquid and Polymerized CO up to 20 GPa Using Pair Distribution Function Analysis

N. Rademacher, L. Bayarjargal, W. Morgenroth, B. Winkler, Goethe University, Frankfurt am Main, Germany
J. Ciezak-Jenkins, S. Batyrev, US Army Research Laboratory, Aberdeen Proving Grounds, MD, USA

10:00 D-25 High Energy X-ray Powder Diffraction at Petra III – Real Space Data in Real Time Under Real Conditions

A.-C. Dippel, J. Torben Delitz, P. Walter, H.-P. Liermann, Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany
M. Hinterstein, Institut fuer Werkstoffwissenschaft, Technische Universität, Dresden, Germany

10:20 Break

10:50 D-15 Neutron Pair Distribution Function Study of Hydrogen Loaded Pu-Ga Alloys

A.I. Smith, K.L. Page, S. Richmond, J. Siewenie, T.A. Saleh, F. Hampel, M. Ramos, A. Llobet-Megias, J.N. Mitchell, D.S. Schwartz, Los Alamos National Laboratory, Los Alamos, NM, USA

11:10 D-81 Ambient and Variable-Temperature PDF Studies on a Laboratory Instrument

M. Sommariva, M. Gateshki, C.A. Reiss, M. Fransen, PANalytical B.V., Almelo, The Netherlands

XRF

Applications for Portable XRF || *Standley Ballroom I*

Chair: K.A. Russell, *Olympus Innov-X, Woburn, MA, USA, kimberley.russell@olympusndt.com*
Co-Chair: W. Benzel, *USGS, Denver, CO, USA*

9:10 F-71 Invited—Use of Handheld XRF Analyses in the Characterization, Assessment, Remedial Design, and Cleanup of Lead Contaminated Sites in Developing Countries

I.H. von Lindern, TerraGraphics International Foundation, Moscow, Idaho, USA

9:40 F-41 Performance Comparison of Portable XRF Instruments: A Mineral Exploration Industry Prospective

N.W. Brand, C.J. Brand, Portable XRF Services Pty Ltd, West Perth, Australia

10:00 Break

10:30 F-4 Rapid Screening of Liquid Dietary Supplements for Nanoscale Silver Using a Portable X-ray Fluorescence Analyzer (P-XRF)

G. Sanchez-Pomales, T. K. Mudalige, J.-H. Lim, S. W. Linder, U.S. Food and Drug Administration, Arkansas Regional Laboratory, Jefferson, AR, USA

10:50 F-6 Portable X-ray Fluorescence for Seed Treatment Technology

W.W. Brubaker, L. Zhang, M.J. Enderle, DuPont Corporate Center for Analytical Sciences, Wilmington, DE, USA
P.T. Richardson, P. Stchur, S. Vanaman, C.A. Daly, S. Lumsdon, R.A. Kaczmarczyk, DuPont Crop Protection, Newark, DE, USA

11:10 F-37 The Role of Handheld XRF in Delineating the Extent and Degree of Lead Contamination in Soils Associated with Artisanal Gold Mining, Northwestern Nigeria

W.M. Benzel, G.S. Plumlee, U.S. Geological Survey, Denver, CO, USA

XRD & XRF

Applied Material Analysis || *Cotton Creek*

Chairs: T. Fawcett, *International Centre for Diffraction Data, Newtown Square, PA, USA, fawcett@icdd.com*
T.N. Blanton, *International Centre for Diffraction Data, Newtown Square, PA, USA, tblanton@icdd.com*

1:00 D-57 Invited—Structure Design of New Cathode Materials for Li-ion batteries
E.V. Antipov, N.R. Khasanova, O.A. Drozhzhin, Department of Chemistry, Moscow State University, Moscow, Russia

1:30 D-38 In-situ Monitoring of Vanadium Oxide Formation Using High Temperature XRD
M.A. Rodriguez, N.S. Bell, J.J.M. Griego, C. Edney, Sandia National Laboratories, Albuquerque, NM, USA

1:50 D-45 Structure Determination and Refinement of High Symmetric LED Phosphor Materials Using XRD Powder Diffraction
Y.-i. Jang, K.-y. Hong, K.-h. Park, LG Electronics, Seoul, Korea

2:10 D-31 Macroscopic Metrology of Nanoscale Materials
J. Giencke, B. Jones, M. Sunder, H. Cordes, B. He, Bruker AXS, Madison, WI, USA

2:30 D-9 In Situ Observation of Liquid Sintering of Calcium-Ferrite by Quick X-ray Diffraction System
R. Murao, M. Kimura, Nippon Steel & Sumitomo Metal, Futtsu, Chiba, Japan
N. Ohta, Nippon Steel Technoresearch, Futtsu, Chiba, Japan

2:50 C-8 HAPG Mosaic Crystals and Their Application in High Resolution X-ray Spectroscopy
M. Gerlach, B. Beckhoff, I. Holfelder, Physikalisch-Technische Bundesanstalt, Berlin, Germany
L. Anklamm, H. Legall, W. Malzer, C. Schlesiger, Technical University Berlin, Berlin, Germany
A. Antonov, I. Grigorieva, Optigraph GmbH, Berlin, Germany

3:10 Break

3:30 D-7 Diffraction Studies of Selected Molecular Sieves and Metal Organic Framework Materials for CO_2 Capture Applications
W. Wong-Ng, L. Espinal, A. Allen, Q. Huang, NIST, Gaithersburg, MD, USA
J.A. Kaduk, Illinois Institute of Technology, Chicago, IL, USA
L. Li, Boise State University, Boise, ID, USA
M.R. Suchomel, Advanced Photon Source, Argonne National Laboratory, Argonne, IL, USA

3:50 D-19 X-ray Investigations of Solid Solutions of Monocalciumaluminate and Monostrontiumaluminate Important Phases in Cement and Phosphorescence Materials
H. Pöllmann, University Halle, Halle, Germany

4:10 C-5 Development of Grating-Based Stroboscopic X-ray Phase Imaging Using Polychromatic Laboratory and Synchrotron X-ray Sources
M.P. Olbinado, The University of Tokyo, Kashiwa, Chiba, Japan
P. Vagovic, W. Yashiro, A. Momose, Tohoku University, Aoba, Sendai, Japan

4:30 C-2 Characterization of Materials Using Combined X-ray Microanalysis and Diffraction Methods
S. Addepalli, T. Shalini, GE Global Research, Bangalore, Karnataka, India

4:50 D-8 Materials Characterization from Diffraction Intensity Distribution in Gamma Direction
B. He, Bruker AXS, Madison, WI, USA

XRD

POLYMERS || *Meadowbrook*

Chair: L. Liu, *Beijing Research Institute of Chemistry, Beijing, China, violetlj208@gmail.com*

1:30 D-41 INVITED—USAXS/SAXS/WAXS INSTRUMENT FOR MATERIALS RESEARCH

J. Ilavsky, P.R. Jemian, G.G.Long, Advanced Photon Source, Argonne National Laboratory, Argonne, IL, USA
A.J. Allen, F. Zhang, L.E. Levine, National Institute of Standards and Technology, Gaithersburg, MD, USA

2:15 D-42 ORIENTATION, CRYSTALLINITY, AND MECHANICAL PROPERTIES OF BIAXIALLY STRETCHED POLYETHYLENE TEREPHTHALATE FILMS USING X-RAY DIFFRACTION

S. Bandla, M. Allahkarami, J.C. Hanan, Oklahoma State University, Tulsa, OK, USA

2:45 D-34 A NEW "CHAIN" OF EVENTS: POLYMERS IN THE POWDER DIFFRACTION FILE™ (PDF®)

S.D. Gates, S.N. Kabekkodu, T.G. Fawcett, International Centre for Diffraction Data, Newtown Square, PA, USA
T.N. Blanton, *International Centre for Diffraction Data, Newtown Square, PA,* USA
J.A. Kaduk, Illinois Institute of Technology, Chicago, IL, USA

3:15 BREAK

3:45 D-2 CHARACTERIZING PROCESS INDUCED CRYSTAL MODIFICATIONS IN POLY(ETHERKETONEKETONE) (PEKK) BY SCATTERING TECHNIQUES

P. Ricou, B. Clay, Arkema Inc., King of Prussia, PA, USA
M. Garcia-Leiner, Exponent, Bowie, MD, USA

4:15 D-6 X-RAY SCATTERING ON CASEIN MICELLES AND HIGH DENSITY LIPOPROTEIN (HDL) GRANULES DURING PROCESSING OF FOODS

R. Gebhardt, Technische Universität München, Freising, Bavaria, Germany

XRF

FUSION & INDUSTRIAL APPLICATIONS OF XRF || *Standley Ballroom I*

Chair: J.A. Anzelmo, *Anzelmo & Associates, Inc., Madison, WI, USA, jaanzelmo@aol.com*
Co-chair: J.V. Thomas, *Wyoming Analytical Labs, Laramie, WY, USA, jthomas@wal-lab.com*

1:30 F-67 INVITED—APPLICATION OF XRF TO COMBUSTION RESIDUES

J.V. Thomas, C.R. Wilson, Wyoming Analytical Laboratories, Inc., Laramie, WY, USA

2:00 F-53 MERCURY EMISSIONS MONITORING BY TXRF

M. Garcia, N. Kumar, nanoXRF, Fort Worth, TX, USA

2:20 F-51 HIGH-PRECISION ANALYSIS OF IRON ORE BY WAVELENGTH-DISPERSIVE X-RAY FLUORESCENCE SPECTROMETRY

B. Vrebos, PANalytical, Almelo, The Netherlands

2:40 F-20 ISO 9615-1 SIMPLIFIED BORATE FUSION / WDXRF ANALYTICAL METHOD FOR IRON ORE INCLUDING TOTAL IRON ANALYSIS: PART 2

M. Bouchard, A. Milliard, S. Rivard, Claisse, Corporation Scientifique, Québec, QC, Canada
S. Ness, Intertek Genalysis, Perth, Australia

3:00 BREAK

3:30 F-19 THE STUDY OF CHLORINE ANALYSIS BY XRF USING SAMPLE PREPARATION BY BORATE FUSION FOR CEMENT INDUSTRY RELATED MATERIALS

M. Bouchard, A. Milliard, S. Rivard, Claisse, Corporation Scientifique, Québec, QC, Canada

3:50 F-29 Aerosol Filter Analysis Using Polarized Optics EDXRF with Thin Film FP Method

A. Morikawa, T. Moriyama, M. Doui, Rigaku Corporation, Osaka, Japan
S. Fess, Applied Rigaku Technologies, Inc., Austin, TX, USA

4:10 F-40 Extremely High Count-Rate Performance of Silicon Drift Detector

S. Barkan, L. Feng, V. D. Saveliev, M. Takahashi, Y. Wang, M. Uehara, E.V. Damron, Hitachi High-Technologies Science America, Inc., Northridge, CA, USA

4:30 F-33 Effective Grade Control in Mining by Energy-Dispersive X-ray Fluorescence - Advantages with New Technology

A. Buman, D. Pecard, Bruker AXS, Madison, WI, USA
K. Behrens, F. Portala, Bruker GmbH, Karlsruhe, Germany

Micro XRF || *Standley Ballroom II*

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

1:50 F-61 Invited—Superconducting Microcalorimeters for Time-Resolved and Other Photon-Starved X-ray Spectroscopies

J. Uhlig, J. Ullom, W.B. Doriese, J. Fowler, C. Reintsema, D. Swetz, D. Bennett, G. Hilton, K. Irwin, D. Schmidt, NIST Boulder, Boulder, CO, USA
J. Uhlig, W. Fullagar, N. Gador, S. Canton, K. Kinnunen, V. Sundstrom, Lund University Chemical Physics, Lund, Sweden

2:20 F-11 Characterization of Metal Doped Polymer Capsules Using Confocal Micro X-ray Fluorescence Spectroscopy and X-ray Computed Tomography

N.L. Cordes, G.J. Havrilla, K.A. Obrey, B.M. Patterson, Los Alamos National Laboratory, Los Alamos, NM, USA

2:40 F-69 Invited—High Resolution X-ray Fluorescence Microscopy: Challenges and Opportunities

S. Vogt, C. Jacobsen, Argonne National Laboratory, Argonne, IL, USA and Northwestern University, Evanston, IL, USA
S. Chen, S.-C. Gleber, L. Finney, J. Ward, D. Vine, L. Trahey, J. Maser, B. Lai, Argonne National Laboratory, Argonne, IL, USA
J. Deng, R. Mak, T. Paunesku, K. Brister, G. Woloschak, Northwestern University, Evanston, IL, USA
L. Makowski, Northeastern University, Boston, MA, USA
C. Flachenecker, Xradia Inc., Pleasanton, CA, USA

3:10 Break

3:40 F-44 Invited—Confocal MicroXRF in Vacuum: Setup and Applications

C. Streli, S. Smolek, B. Pemmer, P. Wobrauschek, Atominstitut, Vienna, Austria

4:10 F-21 Micro X-ray Fluorescence in Food Forensics & Food Safety

V.L. St. Jeor, Cargill Incorporated, Excelsior, MN, USA

4:30 F-14 Forensic Application of Micro-XRF: Determination of Unique Compositional Patterns in Glasses: Multivariate Approach and Statistical Analysis

S. Mamedov, Horiba Scientific, Edison, NJ, USA

4:50 F-50 Thickness and Composition Analysis of Thin-Film Solar Cells via Micro-XRF

A. Lee, M. Chipman, B. Scruggs, EDAX, Mahwah, NJ, USA

FRIDAY AM

XRD

New Developments in Rietveld Analysis || *Standley Ballroom II*

Chair: M. Suchomel, *APS - Argonne National Laboratory, Lemont, IL, USA, suchomel@aps.anl.gov*

8:30 D-32 Invited—Representational Analysis of Extended Disorder in Large Atomistic Ensembles Generated from Diffraction Data

J.R. Neilson, Colorado State University, Fort Collins, CO, USA
T.M. McQueen, Johns Hopkins University, Baltimore, MD, USA

9:00 D-4 Structural Study of Nanostructured Cr-Co Based Alloys by X-ray Diffraction Line Profile Analysis

S. Louidi, Université 20 Août 1955, Skikda, Algérie
F.Z. Bentayeb, Université Badji-Mokhtar, Annaba, Algérie
J.J. Sunol, **L. Escoda**, Universitat de Girona, Girona, Spain

9:20 D-62 A Real Space Rigid Body Approach to Quantifying Incommensurate Stacking Faults in Layered Oxides

S.T. Misture, Alfred University, Alfred, NY, USA

9:40 Break

10:00 D-60 Invited—Combining Powder Diffraction with Solid State NMR Spectroscopy for Structure Elucidation via Rietveld Analysis

M. Allix, F. Fayon, E. Véron, A.-L. Rollet, S. Cadars, G. Matzen, D. Massiot, Université d'Orléans, Orléans, France
M. Suchomel, Argonne National Laboratory, Advanced Photon Source, Argonne, IL, USA
F. Porcher, CEA Saclay, Gif Sur Yvette, France
C. Martineau, Université de Versailles Saint-Quentin en Yvelines, Versailles, France

10:30 D-29 Crystal Structures of $SrR_2Sc_2O_7$, R = Pr, Nd, Sm, Eu, and Gd

J.A. Kaduk, Illinois Institute of Technology, Chicago, IL, USA
W. Wong-Ng, NIST, Gaithersburg, MD, USA

10:50 D-54 In Situ XRD Studies of PDZN Methanol Steam Reforming Catalyst

E.J. Peterson, J.A. Paiz, T. Hough, A. DeLaRiva , A.K. Datye, The University of New Mexico, Albuquerque, NM, USA

11:10 D-92 Study of Impurities in SRM 640C and SRM 660A Using Diffraction Data from 11BM at the APS

J. Faber, Faber Consulting, Thornton, PA, USA
M. Suchomel, APS, Argonne National Laboratory, Argonne, IL, USA

XRF

Trace Analysis || *Standley Ballroom I*

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

8:30 F-70 Invited—GIXRF and GIXAS at Trace Levels

F. Meirer, Fondazione Bruno Kessler, Povo (Trento), Italy and Utrecht University, Utrecht, The Netherlands
G. Pepponi, Fondazione Bruno Kessler, Povo (Trento), Italy
D. Ingerle, C. Streli, Atominstitut, Vienna University of Technology, Vienna, Austria
A. Mehta, P. Pianetta, Stanford Synchrotron Radiation Lightsource, Menlo Park, CA, USA

9:00 C-7 Invited—The Hard X-ray Micro/Nano-Probe Beamline P06 at PETRA III/DESY: The First Year of User Operation

G. Falkenberg, DESY, Hamburg, Germany

9:30 F-58 Ultra High Energy X-ray Fluorescence Direct Detection of Plutonium and Uranium Through Container Walls

G.J. Havrilla, V.M. Montoya, K. McIntosh, Los Alamos National Laboratory, Los Alamos, NM, USA
W.T. Elam, University of Washington, Seattle, WA, USA
D. Robinson, Argonne National Laboratory, Argonne, IL, USA

9:50 F-35 XRS for Preventive Conservation in European Museums

R. van Grieken, B. Krupinska, University of Antwerp, Antwerp, Belgium

10:10 Break

10:30 F-43 Heavy Metal Analysis in Lens and Aqueous Humor of Cataract Patients by Total Reflection X-ray Fluorescence Spectrometry

M. Schmeling, Loyola University Chicago, Chicago, IL, USA
B.I. Gaynes, S. Tidow-Kebritchi, Stritch School of Medicine, Loyola University Chicago, Maywood, IL, USA

10:50 F-64 Use of X-ray Spectroscopy for Elemental Analysis of Complex Biological Samples

A. Pejovic-Milic, E. Da Silva, B. Kirkam, Ryerson University, Toronto, ON, Canada

11:10 F-42 Application of Total Reflection X-ray Fluorescence Spectrometry and Grazing Incidence X-ray Fluorescence to Genesis Solar Wind Samples

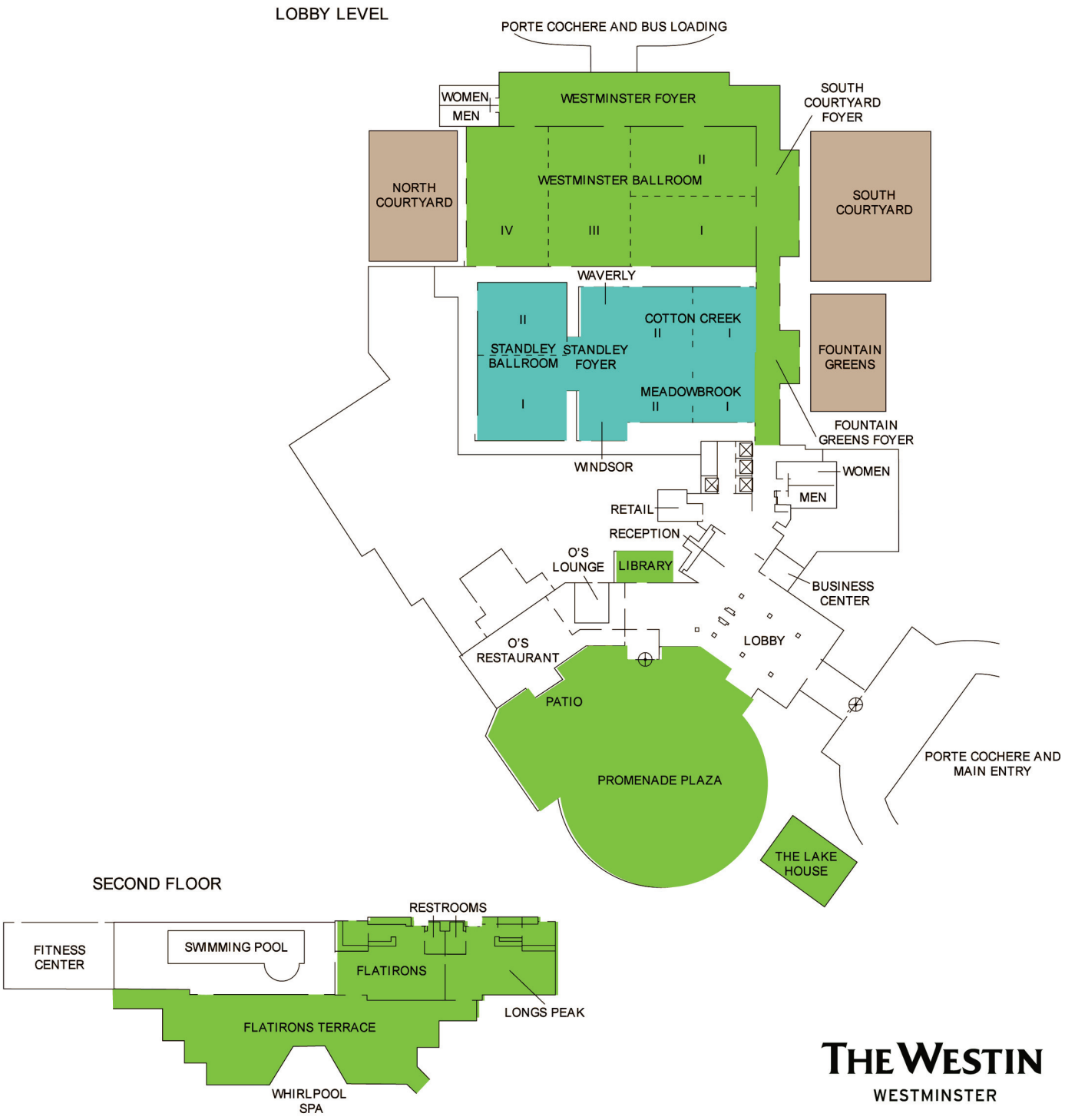
M. Schmeling, Loyola University Chicago, Chicago, IL, USA
Y. Choi, P.J. Eng, J.E. Stubbs, GSECARS University of Chicago, Argonne, IL, USA
I.V. Veryovkin, Argonne National Laboratory, Argonne, IL, USA

11:30 F-26 Microanalysis of Rare Earth Elements Using Pyroelectric Crystal

S. Imashuku, A. Imanishi, K. Ohira, J. Kawai, Kyoto University, Kyoto, Japan

HOTEL LAYOUT

Floor Plans



THE WESTIN
WESTMINSTER

2013 DENVER X-RAY CONFERENCE

PROGRAM-AT-A-GLANCE ◊ MONDAY–FRIDAY ◊ 5–9 AUGUST

	Meeting Room			
	Standley Ballroom I	Standley Ballroom II	Cotton Creek	Meadowbrook
Monday Morning Workshops 9:00 am – 12:00 Noon				
XRD		Introduction to the new GSAS-II Crystallographic Analysis System I (**Toby/Von Dreele**)		Basic to Intermediate XRD Analysis (**Misture/Blanton**)
XRF	Basic XRF (**Elam**)		Trace Analysis (**Wobrauschek/Streli**)	
Monday Afternoon Workshops 1:30 pm – 4:30 pm				
XRD & XRF			X-ray Optics (**Fittschen/Havrilla**)	
XRD		Introduction to the new GSAS-II Crystallographic Analysis System II (**Toby/Von Dreele**)		Total Pattern Analysis (**Fawcett/Kaduk**)
XRF	Energy Dispersive XRF (**Phillips**)			
Monday Evening XRD Poster Session & Reception 5:30 – 7:30 pm; Sponsored by ICDD. Westminster Foyer (**Watkins**)				
Tuesday Morning Workshops 9:00 am – 12:00 Noon				
XRD & XRF	Fundamentals of Digital Signal Processing and X-ray Detectors (**Hayakawa**)			
XRD			Hands-on Rietveld Analysis (**Payzant**)	Modeling & Analysis of Small-angle Scattering I (**Landes/Ilavsky**)
XRF		Quantitative Analysis I (**Mantler**)		
Tuesday Afternoon Workshops 1:30 pm – 4:30 pm				
XRD			Introduction to Volume H (**Kaduk**)	Modeling & Analysis of Small-angle Scattering II (**Landes/Ilavsky**)
XRF	Sample Preparation of XRF (**Anzelmo**)	Quantitative Analysis II (**Mantler**)		
Tuesday Evening XRF Poster Session & Reception 5:30 – 7:30 pm; Sponsored by Chemplex. Westminster Foyer (**Van Grieken/Zaitz**)				
Wednesday Morning Plenary Session 9:00 am – 12:00 pm. The 100th Anniversary of X-ray Spectroscopy (**Havrilla**) Standley Ballroom				
Wednesday Afternoon Sessions				
XRD & XRF	New Developments in XRD & XRF Instrumentation (**Fawcett/Blanton**) 1:15-5:00			
XRD			High Energy XRD (**Almer**) 1:30-4:40	
XRF		Quantitative Analysis (**Brehm**) 1:30-5:00		
Wednesday Evening Vendor Sponsored Reception 5:30 pm - 7:00 pm; Exhibit Hall/Westminster Ballroom				
Thursday Morning Sessions				
XRD & XRF		Applications of XRD & XRF in the Petroleum Industry (**Simon/Morton/Doyle**) 9:00-11:50		
XRD			Stress Analysis (**Brown/Watkins**) 8:00-11:50	Pair Distribution Function (**Ehm**) 9:00-11:30
XRF	Applications for Portable XRF (**Russell/Benzel**) 9:10-11:30			
Thursday Afternoon Sessions				
XRD & XRF			Applied Materials Analysis (**Fawcett/Blanton**) 1:00-5:10	
XRD				Polymers (**Liu**) (1:30-4:45)
XRF	Fusion & Industrial Applications of XRF (**Anzelmo/Thomas**) 1:30-4:50	Micro XRF (**Havrilla**) 1:50-5:10		
Friday Morning Sessions				
XRD		New Developments in Rietveld Analysis (**Suchomel**) 8:30-11:30		
XRF	Trace Analysis (**Zaitz**) 8:30-11:50			