

DXC DENVER X-RAY CONFERENCE

66th Annual

31 July - 4 August 2017 • Big Sky Resort, Big Sky, Montana, USA

2017 Program



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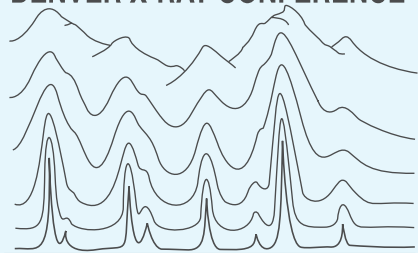
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Future Conferences:

DENVER X-RAY CONFERENCE®



6-10 August 2018

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Westminster, Colorado, USA***

5-9 August 2019

***The Westin Lombard
Yorktown Center, Lombard, IL,
USA***

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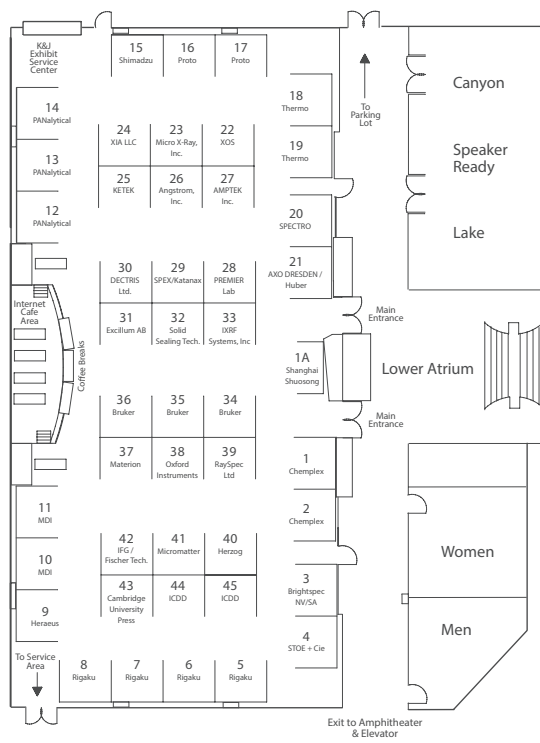
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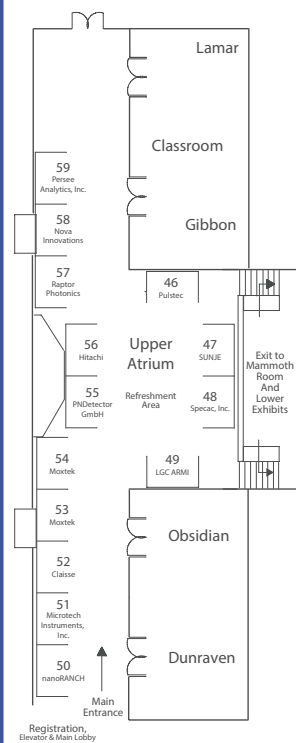
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UPPER LEVEL

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Exhibitors - Yellowstone Conference Center

AMPTEK, Inc.

Booth: 27

Website: www.amptek.com

Email: sales@amptek.com

Introducing newly acquired in-house manufacturing bringing you the highest performing detectors available. This new family of detectors have lower noise, lower leakage current, better charge collection, and uniformity from detector to detector. This results in superior peak-to-background, peak-to-tail, resolution and a more Gaussian spectrum. See our new line of ultra-high performance FAST SDD®, large area FAST SDD®, improved SDD and our newest Si-PIN detectors. For over 40 years, Amptek has defined the true state-of-the-art.

Angstrom, Inc.

Booth: 26

Website: www.angstrom-inc.com

Email: sales@angstrom-inc.com

Angstrom manufactures the highly regarded TE250 Laboratory Ring Pulverizer and 4451AE Laboratory Briquet Press for preparation of various types of samples for X-ray analysis. Since 1962, we have been providing rugged and long lasting sample preparation equipment at a surprisingly low price point. A complete line of aluminum sample cups are offered to complement the 4451AE Briquet Press and a programmable version of the 4451AE Press is available and on display at the Angstrom booth.

AXO DRESDEN GmbH / Huber Diffraction Equipment

Booth: 21

Website: www.axo-dresden.de; www.xhuber.de

Email: contact@axo-dresden.de

HUBER DIFFRACTION is a manufacturer of precise positioning and diffraction equipment for laboratory, synchrotron and neutron applications.

AXO DRESDEN is a specialist for high precision deposition and multilayer coatings and will present latest developments in multilayer X-ray optics for 1- and 2-dimensional diffraction applications (from Cr K- to Ag K-radiation) and soft X-ray polarization (< 1keV), broadband/bandpass multilayer mirrors, as well as, thin film X-ray fluorescence reference samples.

Brightspec NV/SA

Booth: 3

Website: www.brightspec.be

Email: sales@brightspec.be

BrightSpec NV designs and manufactures instruments and intelligent solutions for the nuclear and X-ray market. BrightSpec is proud to present bAXIL software – advance software for X-ray spectrometry. This time, featuring its newly developed and ultra-fast spectrum analysis algorithm for image scanning applications. BrightSpec also presents TopazX, the advanced and compact DPP-based MCA for energy dispersive X-ray spectrometry, which implements innovative digital pulse analysis algorithms and LIST mode of data acquisition.

Bruker

Booths: 34, 35 & 36

Website: www.bruker.com

Email: info@bruker.com

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. Stop by our booth to see the latest innovations in diffraction and fluorescence systems, including our D8 DISCOVER, D8 ADVANCE, D8 ENDEAVOR, D2 PHASER, S2 PUMA, S8 TIGER, S2 PICOFOX, M4 TORNADO and S4 TStar. Unique classroom and online trainings complete the Bruker product portfolio.

Cambridge University Press

Booth: 43

Website: www.cambridge.org/academic

Email: information@cambridge.org

Cambridge University Press' publishing in books and journals combines state-of-the-art content with the highest standards of scholarship, writing and production. Visit our stand to browse new titles, available at 20% discount, and to pick up sample copies of our journals. Visit our website to find out more about what we do: www.cambridge.org/academic.

Chemplex Industries, Inc.

Booths: 1 & 2

Website: www.chemplex.com

Email: sales@chemplex.com

A leading global provider of XRF Sample Preparation Products. We manufacture an extensive line of grinding machines and pellet presses, including the SpectroPulverizer® in-field grinding/pelletizing kit. We carry a line of FusionFlux® formulations, platinum ware and a new line of Fluxers. We have over 40 different sizes and style sample cups from Chemplex® along with thin-film sample supports, including our exclusive SpectroMembrane® thin-film carrier frames. We offer thin-films made from Etnom®, Prolene®, Mylar® and more in a variety of thicknesses.

Claisse

Booth: 52

Website: www.claisse.com

Email: esoares@claisse.com

Claisse is internationally renowned for offering a complete solution in sample preparation for XRF, ICP and AA analysis. For over 40 years, our experts have been producing fusion instruments and consumables, as well as providing service and expertise to help you obtain great analytical results. Electric or gas fusion instruments, borate fluxes, certified reference materials, platinumware, application notes, method development, technical and applicative trainings... Claisse is your one-stop shop for sample preparation by fusion!

DECTRIS Ltd.

Booth: 30

Website: www.dectris.com

Email: info@dectris.com

DECTRIS Ltd. is the leading company in Hybrid Photon Counting (HPC) X-ray detection. DECTRIS' pioneering technology has transformed basic research at synchrotron light sources, as well as, X-ray applications in laboratory diffractometers. The broad portfolio of DECTRIS' detectors is carefully scaled to meet the needs of various applications. With an aim to continuously improve the measurement quality, DECTRIS also provides solutions for customer developments in scientific and industrial X-ray detection, thereby pushing the state of the art and enabling new scientific findings.

Excillum AB

Booth: 31

Website: www.excillum.com

Email: sales@excillum.com

Based in Stockholm, Sweden, Excillum makes the world's brightest microfocus x-ray tubes, the MetalJet tubes. The MetalJet x-ray tubes are conventional microfocus tubes with the solid-metal anode replaced by a liquid-metal jet. A metal-jet anode is continuously regenerated and already in the molten stage. Thereby, a much higher x-ray brightness can be achieved – enabling faster experiments or experiments with higher data quality! Please come by our booth, and we will tell you more about our technology!

Heraeus

Booth: 9

Website: www.ptlabware.com

Email: heraeus-platinum-labware@heraeus.com

Improve the quality of your Sample Preparation by improving the quality of your Platinum Labware. Since 1851, Heraeus has produced the highest quality Platinum Labware and Precious Metal Products. Whether you prepare your samples manually or with an automatic fusion machine, Heraeus is the Perfect Solution for your Platinum Labware needs. Visit booth # 9 to learn more.

Herzog Automation Corp.

Booth: 40

Website: www.herzogautomation.com

Email: info@herzogautomation.com

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 Tech Science America, Inc.

Booth: 56

Website: www.hitachi-hightech.com/hhs-us

Email: sales@hitachi-hitec-science.us

Hitachi High Tech Science America Inc. designs and manufactures the Vortex line of Silicon Drift Detectors (SDDs) for applications ranging from benchtop instrumentation to the most demanding synchrotron spectroscopy and mapping installations. HHS-US takes pride in working with end-users on custom designs suited to their exact needs. In 2017, we introduce the ME-7, 7 element detector with the tightest spacing configuration available. Stop by to see how we can help you with your X-ray detector needs.

IFG / Fischer Technology, Inc.

Booth: 42

Website: www.ifg-adlershof.de

Email: ifg@fischer-technology.com

IFG - Institute of Scientific Instruments and Fischer Technology are world leaders in the field of high quality measurement technology and components for the analytical industry. Products include XRF-spectrometers as well as high precision capillary optics for beam shaping of X-rays, the iMOXS modular X-ray source and X-ray windows. Our products are used in process-near in and off-line metrology.

International Centre for Diffraction Data

Booths: 44 & 45

Website: www.icdd.com

Email: marketing@icdd.com

For over 75 years, our mission has focused on meeting the needs of the scientific community through the publication of the Powder Diffraction File™ (PDF®) and providing forums for the exchange of ideas and information. The 2018 Powder Diffraction File™ product line will be released September 2017 with many new entries and features. These material identification databases are interfaced with diffractometers and data analysis systems of the world's leading software developers and manufacturers of X-ray equipment.

IXRF Systems, Inc.

Booth: 33

Website: www.ixrf.com

Email: info@ixrf.com

Micro X-ray fluorescence analyzer. The new ATLAS from IXRF Systems raises the standard in Micro-XRF analysis. ATLAS boasts the largest chamber volume, mapping area travel and SDD detection area (150mm²) as well as the smallest spot size available to the market (10µ). Additionally, the ATLAS is complimented by a comprehensive software suite including multi-point analysis, unattended automation, in-depth feature/image analysis, unprecedented mapping, thin-film and phase analysis, custom reporting, and much more. Models may be operated under air, vacuum, or helium.

KETEK

Booth: 25

Website: www.ketek.net

Email: info@ketek.com

As the leading manufacturer of Silicon Drift Detectors, KETEK is offering a broad SDD module portfolio with collimated areas from 7mm² up to unprecedented 150mm². On top of this, the brand new 7-channel SDD Array VA560 with 560mm² collimated area is now available. Our latest VITUS SDD generation now offers an unprecedented, long term cooling performance: stable -60°C chip temperature at up to +60°C heat sink ($\Delta T > 120K$) and 50% less power consumption. Together with energy resolutions < 123eV (MnK α), P/B ratios above 25,000 and peaking times down to 50ns for extremely high count rates this marks the real state-of-the-art performance.

LGC ARMI

Booth: 49

Website: www.armi.com

Email: manchester.armi@lgcgroup.com

LGC ARMI manufactures a range of high quality metal alloy reference materials for XRF analysis under the IARM brand and has the capability to source reference materials from around the world. Our extensive product offering includes: carbon, low alloy and tool steels, stainless and high temperature steels, nickel alloys, cobalt alloys, copper, brass and bronze alloys, titanium alloys, and aluminum alloys. We are also the exclusive worldwide distributor of Rio Tinto Alcan products for aluminum industry applications.

Materials Data, Inc.

Booths: 10 & 11

Website: www.materialsdata.com

Email: mdi@materialsdata.com

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 booths 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: 37

Website: www.materion.com/electrofusion

Email: electrofusion@materion.com

Beryllium and beryllium oxide (BeO) windows and assemblies for X-ray tubes and detectors – high purity (99.8%), vacuum tight, as thin as 8µm. Radiographically-inspected, artifact-free beryllium for use in mammography, semiconductor inspection, and other applications requiring exceptional clarity. Thin film metallic target coatings for transmission X-ray tubes. High temperature (960° C) brazing and rapid prototyping service available.

Micro X-Ray, Inc.

Booth: 23

Website: www.microxray.com

Email: info@microxray.com

Micro X-Ray, Inc. designs and manufactures low power x-ray tubes used in applications such as XRF, XRF, thickness gauging and imaging. Products include glass x-ray tube inserts for OEM's; silicon encapsulated x-ray tubes and shielded/package tubes for integrators or end users. We also provide all associated power supplies, cables, as well as thermal management systems for higher power applications, or in high temperature environments. Micro X-Ray engineers and production personnel have many years' experience designing and building x-ray tubes. As such, we are pleased to design tubes per customer specific requirements or for unique applications. Whether you are a large OEM, system integrator, repair facility, university or laboratory, we welcome the opportunity to discuss your specific x-ray tube requirements.

Micromatter Technologies, Inc.

Booth: 41

Website: www.micromatter.com

Email: info@micromatter.com

MICROMATTER has provided XRF calibration materials for more than 40 years. Our products include ultra-light standards for air quality monitoring, thick (rolled) foil standards for metallurgical applications, standards for RoHS detection and multi-element samples. We also provide metallic, semiconductor, polymer, insulator and exotic thin films. Micromatter supplies customized composite SiN windows for low-energy X-ray detectors. Furthermore, Micromatter is the leading manufacturer of beam stripping foils, with specialization on diamond-like carbon, DLC-Boron hybrid, pure boron and graphene based materials.

Microtech Instruments, Inc.

Booth: 51

Website: www.mtinstruments.com

Email: sales@mtinstruments.com

The XRS Compact is a new Microfocus X-ray Source featuring an optical beam overlay allowing the X-ray radiation path to be visible. The small spot size and short focus-to-object distance makes it an ideal source for high resolution imaging in non-destructive inspection and X-ray CT. Its compact design allows for use in benchtop XRF and XRD experiments, and by OEM and industrial users.

Moxtek, Inc.

Booths: 53 & 54

Website: www.moxtek.com

Email: info@moxtek.com

Moxtek is a major supplier of miniature x-ray components (Sources, Detectors, Windows, and DPPs) and advanced nano-optic components used in display electronics, imaging and analytical instrumentation. Moxtek is a leader in x-ray technology with recent developments including: the Mox HPC family of air-cooled, 75kV x-ray tubes with power ratings from 100W to 350W; MAGPRO 70kV, 12W x-ray source for benchtop XRF/XRD; MoxMicro tube with a <50µm focal spot at 30W; and Mox120kV, 5W source for high energy XRF.

nanoRANCH-UHV Technologies

Booth: 50

Website: www.nanoRANCH.com

Email: sales@nanoranch.com

nanoXRF, a nanoRANCH company is a division of UHV Technologies, Inc. with extensive R&D, service and manufacturing capabilities in Fort Worth, TX and Lexington, KY. The current R&D projects include high throughput in-line XRF for aluminum alloy sorting, TXRF based mercury continuous emissions monitor, in-line XRF for metallic contamination measurement during pharmaceutical manufacturing and nano-layered free-standing low-Z thin films (diamond and boron) for stripper foils and x-ray windows. Our products include diamond and DLC films and coatings, x-ray multi-layer coatings, DLC stripper foils, XRF standards, particularly our proprietary nano-standards, metallic alloy standards, and hard to find thick standards. We also provide XRF and TXRF services for various industries. In addition, R&D and prototyping services for high technology devices and products are also available. We also manufacture thin film equipment such as sputtering, evaporation and PECVD systems.

Nova Innovations

Booth: 58

Website: novainnovations.net

Email: travis@novainnovations.net

Oxford Instruments

Booth: 38

Website: www.oxford-instruments.com

Email: industrial@oxinst.com

Oxford Instruments is a leading provider of handheld and benchtop X-ray fluorescence (XRF) analyzers for materials and coatings analysis throughout a product's lifecycle from raw material exploration, incoming inspection, production control and QA/QC to recycling. Boost your quality program and improve production efficiency to ensure that products meet target specifications and comply with regulatory standards. Our technology experts can develop customized testing methodology for your applications.

Stop by Booth 38 to learn how our instruments can assist your team to provide costs savings and improve process control. For further information email industrial@oxinst.com.

PANalytical, Inc.

Booths: 12, 13 & 14

Website: www.panalytical.com

Email: ask@panalytical.com

A new era at Malvern PANalytical... The strength of two great organizations is in the combination of forces - whether it is engineering, software development, application expertise or service, our drive is to bring value to our customers so they can confidently explore new materials, design and test their materials, and efficiently produce high quality products. We are excited to present several new XRD, XRF and sample preparation concepts this year, setting new standards in data quality, functionality, flexibility and value. Booths 12, 13, 14.

Persee Analytics, Inc.

Booth: 59

Website: www.perseena.com

Email: sales@perseeanalytics.com

PERSEE is a world-leading manufacturer of analytical instrumentation. We develop and manufacture innovative chemical analytical instrumentation for laboratories in industry and research institutions.

PNDetector GmbH

Booth: 55

Website: www.pndetector.de

Email: info@pndetector.de

PNDetector is producing advanced radiation detectors for microanalysis, quality assurance and materials science in their own cleanroom fabrication facilities. PNDetector offers state-of-the-art detectors for X-ray spectroscopy and electron imaging such as SDDs and pnCCD camera systems used in a wide variety of instruments for X-ray Analysis. The Color X-ray Camera is a high resolution Imaging Spectrometer based on the energy dispersive pnCCD detector, which enables excellent spectroscopic performance for a wide range of X-ray applications.

PREMIER Lab Supply, Inc.

Booth: 28

Website: www.premierlabsupply.com

Email: info@premierlabsupply.com

PREMIER manufactures and distributes XRF sample preparation consumables, equipment and platinum labware items. PREMIER's consumables include XRF liquid sample cells, thin films and sample support materials, along with products and accessories for press pelletizing, and fusion. Visit our booth to learn about our electric xrFuse 2 and 6 position fusion machines. The xrFuse machines are engineered to prepare permanent and homogeneous fused beads under accurate reproducible conditions. The system brings 25 years of fusion technology to deliver contamination free performance.

Proto

Booths: 16 & 17

Website: www.protoxrd.com

Email: info@protoxrd.com

PROTO is a leading manufacturer of X-ray diffraction (XRD) systems. Our product line includes residual stress measurement systems, powder diffraction, Laue single crystal orientation and custom XRD systems. Our AXRD Benchtop powder diffraction system provides a low-cost alternative that is ideal for Phase Identification, Quantitative Analysis or Structure Analysis.

Pulstec USA, Inc.

Booth: 46

Website: www.pulstec.net

Email: toshi@pulstec.net

Pulstec will exhibit non-destructive X-ray diffraction(XRD) based residual stress analyzer. This small, light-weight, low-cost, low-radiation-dose, fast-cycletime analyzer can measure RESIDUAL-STRESS, FWHM and RETAINED-AUSTENITE by detecting the full Debye ring's profile from single incident X-ray angle. Ideal to use in lab or on-site.

Raptor Photonics

Booth: 57

Website: www.raptorphotonics.com

Email: sales@raptorphotonics.com

A leading developer and supplier of next generation, high-performance digital camera solutions for the Scientific, Surveillance and Industrial markets. Raptor offers a range of CCD, EMCCD, Scientific CMOS and InGaAs solutions. As well as standard products, Raptor provides custom solutions to OEM and Instrumentation companies around the World.

RaySpec Ltd

Booth: 39

Website: www.rayspec.co.uk

Email: sales@rayspec.com

RaySpec's (formerly SGX Sensortech) Sirius SDD product line includes 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 SDD detector products with individual sensor active areas ranging from 7mm² to 170mm² active area. Additionally, RaySpec 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.

Rigaku Americas Corporation

Booths: 6, 7 & 8

Website: www.rigaku.com

Email: info@rigaku.com

Rigaku manufactures a complete range of XRD and XRF instruments and components for research, testing, industrial process control, and products development. Systems include the MiniFlex benchtop XRD and Supermini 200 benchtop WDXRF systems, the Ultima IV and SmartLab® multi-purpose diffractometers with SAXS and in-plane capabilities, D/MAX RAPID II micro-diffraction systems, S-MAX3000 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

Booth: 5

Website: www.RigakuOptics.com

Email: Optics@rigaku.com

Rigaku Innovative Technologies: multilayer optics for all applications. Osmic™ CMF Optics with Arc)Sec® technology provide higher flux and smaller spot size than Montel optics. MicroMax® microfocuss X-ray generators offer the most brilliance while consuming less energy. Max-Flux® optics provide lower divergence than "Gobel" mirrors. Ovonix™ multilayer analyzers bring top performance and lifetime reliability for WDXRF spectrometry.

Shanghai Shuosong Electronics Technology Col., Limited

Booth: 1A

Website: www.shuosong.com

Email: ylilya925@163.com

Shanghai Shuosong Electronic Technology is a high technology enterprise that specialized in analytical window researching and manufacturing. We have cooperated with many companies, universities and research facilities since its set up. Our main products include beryllium foil, brazed beryllium x-ray window, beryllium window in CF flange and sapphire vacuum viewports. All product in Shuosong Electronic Technology is custom fabricated; we accept customized design according to specific requirements. We wish to cooperate with you by our high quality products and efficient service.

Shimadzu Scientific Instruments, Inc.

Booth: 15

Website: www.shimadzu.com

Email: maquaranta@shimadzu.com

Shimadzu offers an array of EDXRF spectrometers and X-ray diffractometers for an array of materials science applications. Advanced EDX-7000/8000 spectrometers incorporate a high-performance, electronically cooled semiconductor detector, a high fluorescent X-ray count per unit time, five primary filters, and a sample observation camera. Software features an intuitive user interface, simplifying operation for all operators. A new one-dimensional detector with 1280 channels for XRD provides high-speed quantitative analysis with three types of measurement modes, high sensitivity, and enhanced operational efficiency.

Solid Sealing Technology, Inc.

Booth: 32

Website: www.solidsealing.com

Email: info@solidsealing.com

Solid Sealing Technology specializes in the design and manufacture of highly engineered, hermetic products for OEM's and research scientists using metalizing and brazing, glass-ceramic sealing, welding, and critical mechanical assembly. Products include: high voltage, high current, high temperature and ultra-high vacuum feedthroughs, coaxial connectors, multi-pin connectors, thermocouple connectors, viewports, and isolators. SST is a global provider of over 1200 industry standard assemblies and custom products.

Specac, Inc.

Booth: 48

Website: www.specac.com

Email: sales@specac.com

Specac is major supplier of FT-IR, Polarizer, Transmission, Reflectance sampling accessories, across the globe, and specializes in XRF Sample preparation products. The XRF sample preparation products include Atlas presses that range from 8 to 40 ton with manual and power assisted or fully programmable options. The Atlas dies have a full range from 20mm to 40mm. New to the XRF sample preparation line is the Fritsch P-6 Planetary Ball Mill featured at Denver X-Ray. Visit us at www.specac.com.

SPECTRO Analytical Instruments

Booth: 20

Website: www.spectro.com

Email: spectro.info@ametec.com

Members of the AMETEK Materials Analysis Division, SPECTRO Analytical Instruments and EDAX are worldwide leading suppliers of OES and X-ray fluorescence spectrometry technology, used for the elemental analysis of materials in industry, research and academia. SPECTRO will feature the new XEPOS with breakthrough advances in excitation and detection. EDAX XLNCE XRF analyzers provide non-destructive, composition and coating thickness measurement and analysis on virtually all materials. They are an excellent choice for R&D, process development, process control, and failure analysis.

SPEX SamplePrep/Katanax

Booth: 29

Website: www.spexsampleprep.com

Email: learnmore@spex.com

SPEX SamplePrep manufactures Grinders, Fluxers and Pellet Presses that prepare samples for X-ray and XRF analysis. Our Katanax line of fluxers are safe, reliable fusion machines. The new Katanax X-300 is an electric, fusion instrument that prepares soil, cement & minerals for XRF analysis with a throughput of up to 15 samples per hour. The X-Press is an automated, 35-ton, hydraulic laboratory press. It is ideal for the repetitive pressing of cement and rock sample into pellets for XRF analysis.

STOE + Cie GmbH

Booth: 4

Website: www.stoe.com

STOE, originally founded in 1887, to manufacture equipment for the optical analysis of crystals, has been a pioneer in powder and single crystal X-ray diffraction since the 1960's, e.g. STOE invented and patented the transmission geometry technique for Powder XRD as well as, for single crystals, produced the first pixel detector XRD system with an open Eulerian cradle. STOE is based in Darmstadt, Germany, and keeps the R&D, software programming, electrical and mechanical engineering and production all in-house, allowing STOE to provide customers with standard, as well as, individual solutions. Whenever it comes to quality, STOE accepts no compromises. This high-level of detail is what sets STOE apart. STOE is the partner in X-ray Diffraction to crystallographers, chemists, material scientists and pharmacists all over the world.

SUNJE

Booth: 47

Website: www.sunstat.com

Email: info@sunstat.com

Our X-ray source ambipolar thermoelectron vacuum tube with high efficiency. This small tube is designed to endure high durability, reduce breakage, and minimize filament disconnection problems and vacuum defect. Suitable for soft X-ray analysis, XRF, X-ray detector, and many other applications. (Allowable radiation range: -2 ~ -20kV). Perfect device for any test equipment in semiconductor or ESD supersensitive production lines.

Thermo Fisher Scientific

Booths: 18 & 19

Website: www.thermofisher.com

Email: analyze@thermofisher.com

Thermo Fisher Scientific, the world leader in serving science, offers a large variety of high-end 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). The Thermo Scientific™ ARL PERFORM'X sequential WDXRF can analyze samples from 35mm diameter down to 0.5mm spots and perform elemental cartography as well allowing analysis of non homogeneous samples. The Thermo Scientific™ ARL™ QUANT'X EDXRF Spectrometer has been redesigned to improve efficiency, ease operation and lower cost of ownership, giving manufacturers and researchers a tool to solve their most challenging analytical tasks. Learn more on www.thermofisher.com/xray.

XIA LLC

Booth: 24

Website: www.xia.com

Email: sales@xia.com

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: 22

Website: www.xos.com

Email: info@xos.com

XOS's advanced optics and OEM sub-systems can increase precision, speed, and spatial resolution, while decreasing the size, complexity, and cost of the instrument. The fleX-Beam™ is a unique, compact X-ray generator that combines a low-powered X-ray source and precisely aligned polycapillary optic to deliver a bright X-ray beam for advanced material analysis. The innovative optic mounting and alignment design enables an easy X-ray tube and/or optic replacement, making it a user-friendly tool for both OEMs and end users. fleX-Beam™ is available in several standard focused or collimated beam configurations and can be customized for specific applications.

DXC 2017 EXHIBIT PASSPORT



AMPTEK, Inc.	Angstrom, Inc.	AXO DRESDEN & Huber Diffraction	Brightspec NV/SA	Bruker	Cambridge Univ. Press	Chemplex
Claisse	DECTRIS Ltd	Excillum AB	Heraeus	Herzog	Hitachi	ICDD
IFG / Fischer Tech.	IXRF Systems, Inc.	KETEK	LGC ARMI	MDI	Materion	Micro X-Ray, Inc.
Micromatter	Microtech Instr.	Moxtek	Nano RANCH	Nova Innovations	Oxford Instruments	PANalytical
Persee Analytics	PNDector	Premier Lab Supply	Proto	Pulstec USA	Raptor Photonics	RaySpec Ltd
Rigaku	Shanghai Shuosong	Shimadzu	Solid Sealing Tech.	Specac, Inc.	Spectro	SPEX / Katanax
STOE & Cie GmbH	SUNJE	Thermo	XIA	XOS	<p>10 companies = 1 chance 20 companies = 2 chance 30 companies = 3 chances All companies = 4 chances</p>	

Win an Apple iPad! The more exhibit companies you visit, the more chances you have to win!
 For every exhibit company you visit, you'll be given a stamp for your passport. Please turn in your stamped passport by Thursday, 3:00pm at the Conference Registration Desk. A member of the Conference Services team will give you chance tickets in exchange for your Exhibit Passport and you will be entered into a drawing to win an Apple iPad. Remember: the more companies you visit, the more chances you have to win! The winner will be announced at 5:00pm on Thursday, via Guidebook and a posting at the Conference Registration Desk. The winner will also be contacted by phone at that time. You must be able to pick up the iPad by Friday morning at 10am, or the prize will be forfeited.

*Only registered attendees are eligible to enter the drawing. Exhibit Hall Only attendees, employees of an exhibiting vendor, guests, and members of the DXC Organizing Committee may not participate.

**Please return this page
to the registration desk**

2017 Denver X-ray Conference Workshops

Morning Workshops – 9:00 am – 12:00 Noon

Afternoon Workshops – 1:30 pm – 4:30 pm

Monday Morning Workshops 9:00 am – 12:00 Noon

Getting Started at User Facilities

North Mammoth - Mountain Mall

Organizer & Instructors:

S.H. Lapidus, APS – Argonne National Laboratory, USA, slapidus@aps.anl.gov

A. Huq, Spallation Neutron Source - Oak Ridge National Laboratory, USA, huq@ornl.gov

J. Wright, Illinois Institute of Technology, USA, jwright@csri.iit.edu

K.H. Stone, SLAC – Stanford University, USA, khstone@slac.stanford.edu

This workshop will introduce the capabilities of user facilities, with particular focus on synchrotrons and neutron facilities. Topics covered will include designing experiments, synchrotron PXRD, neutron PXRD, X-ray fluorescence, EXAFS, various other diffraction techniques (such as grazing incidence, thin film, etc.), and how to write a proposal for a user facility. This course does not suppose any knowledge of user facilities, but does suppose a basic knowledge of diffraction and/or fluorescence.

Specimen Preparation of XRD

Amphitheatre - Yellowstone Conf. Ctr.

Organizer & Instructors:

T. Fawcett, Emeritus, International Centre for Diffraction Data, USA, dxcfawcett@outlook.com

S. Quick, Pennsylvania State University, USA, quick@cse.psu.edu

M. Rodriguez, Sandia National Laboratory, USA, marodri@sandia.gov

Specimen preparation is often the limiting step for obtaining good results in a diffraction experiment. Preparation methods can influence the accuracy and precision of peak positions, intensities and profile. These are the basic measurements required for qualitative and quantitative analysis. The presentation will focus on crystallite and particle effects, orientation and texture, particle statistics and how various preparation methods can reduce or eliminate these influences.

We will also focus on “tricks of the trade” and various techniques that experts use to analyze odd shaped parts, limited samples, as well as, air and moisture sensitive specimens.

Basic XRF

South Mammoth - Mountain Mall

Organizer & Instructors:

A. Drews, Ford Motor Company, USA, adrews@ford.com

K. Kawakyu, Rigaku Corporation, Japan, kawakyu@rigaku.co.jp

This workshop provides a basic introduction to the principles of XRF specifically aimed at those new to the field. In the first half, there will be a general overview of the XRF technique, including a discussion of the basic principles of X-ray interactions with matter. The emphasis in the first half will be on understanding the underlying physical phenomena, how the technique is applied, optimization of the signal, and approaches to quantitative analysis. In the second half of the workshop, examples of real-world applications will be presented to illustrate some of the challenges and opportunities that the analyst may face. This half will describe a variety of specimen formats and demonstrate the flexibility of the XRF technique.

Trace Analysis Including TXRF

Cheyenne - Yellowstone Conf. Ctr.

Organizer & Instructors:

P. Wobrauschek, C. Strelj, TU Wien - Atominstitut, Austria, wobi@ati.ac.at, strelj@ati.ac.at

R. Ayala, Fisichem, Inc., USA and Guatemala, rayala@fisichem.com

K. Tsuji, Osaka City University, Japan, tsuji@a-chem.eng.osaka-cu.ac.jp

N. Kawahara, Rigaku Corporation, Japan, kawahara@rigaku.co.jp

Both beginners and experienced X-ray scientists and applicants, physicists and chemists, should gain information by attending the Trace Analysis workshop. Presentations of most modern techniques and instrumentation for trace element analysis using EDXRS will be given. Physical methods to improve minimum detection limits in XRF by background reduction will be discussed; special emphasis will be on Synchrotron radiation as excitation source. 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 (eg. Carbon). Confocal μ -XRF will be presented as method for 2D and 3D spatial resolved elemental imaging. Applications from interesting scientific fields such as environment, microelectronics, forensic, and life science will show the successful use of the importance of the various XRF spectrometric techniques. The possibilities of trace analysis using Wavelength Dispersive XRF will also be covered, showing the benefits and limitations of the technique. A comparison of achievable detection limits with the various techniques on some specific samples will be discussed.

Monday Afternoon Workshops 1:30 pm – 4:30 pm

Stress

North Mammoth - Mountain Mall

Organizers & Instructors:

I.C. Noyan, Columbia University, USA, icn2@columbia.edu

C. Murray, IBM T.J. Watson Research Center, USA, conal@us.ibm.com

This workshop is intended to introduce novice users to the basic techniques used in diffraction-based residual stress determination. Single exposure, $\sin^2(\psi)$, two-tilt and triaxial stress determination techniques will be introduced and instrumental errors associated with the measurement will be discussed. Examples will be provided that use both laboratory and synchrotron-based techniques, including microbeam measurements. At the end of the seminar, the attendees should be able to evaluate the validity of a diffraction-based stress determination experiment.

Polymers

Amphitheatre - Yellowstone Conf. Ctr.

Organizers & Instructors:

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

S. Murthy, Rutgers University, USA, murthy@biology.rutgers.edu

The workshop will introduce novices to polymer X-ray scattering and to reintroduce practitioners of the technique to the new developments in over the past decade. The workshop will cover both small- and wide-angle scattering, and discuss measurements that can be carried with in-house X-ray sources as well as at synchrotron radiation facilities. The workshop will start with basics of morphology and the crystalline characteristics of semi-crystalline polymers, and instrumentation and principle of the measurement. Following topics will be covered with emphasis on topics of interest to the participants.

1. Methods of measuring relative and absolute crystallinity. Issues in the measurements of crystallinity: Background, amorphous halo, the angular range, and preferred orientation. Separation of size and disorder effects.
2. Texture in polymers. Significance of orientation. Determination of orientation in polymers. Amorphous and crystalline orientation.
3. Small-angle X-ray scattering. Void scattering and size analysis. Lamellar and fibrillar structure in polymers.
4. Special techniques: Grazing-incidence measurements. Surface and thin films analysis. Reflectivity. GI-SAXS and GI-WAXS. Microdiffraction.
5. Synchrotron radiation and its use in polymer diffraction in-situ deformation and DSC.

Energy Dispersive XRF

South Mammoth - Mountain Mall

Organizer & Instructors:

P. Lemberge, Thermo Fisher Scientific, Switzerland, pascal.lemberge@thermofisher.com

W.D. Watson, Thermo Fisher Scientific, USA, wayne.watson@thermofisher.com

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 excitation systems; detectors; components and their relation to EDXRF applicability; 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 as well as sample preparation. We discuss some real-life application examples where EDXRF is being used to solve complex analytical problems. The major emphases will be on the applicability of EDXRF and the optimal protocol for generating and reporting of reliable experimental results.

Micro XRF

Cheyenne - Yellowstone Conf. Ctr.

Organizer & Instructors:

K.C. Witherspoon, IXRF Systems, Inc., USA, kennyw@ixrfsystems.com

The MXRF workshop will provide an overview of micro X-ray fluorescence (MXRF) including a survey of applications and capabilities as well as an in-depth discussion on common components used in MXRF instruments. The workshop will explore quantitative analysis in addition to elemental imaging (mapping/scanning) as well as their particularities.

Tuesday Morning Workshops 9:00 am – 12:00 Noon

Rietveld Refinement using In Situ Powder Diffraction Data I

Amphitheatre - Yellowstone Conf. Ctr.

Organizers & Instructors:

A. Yakovenko, APS – Argonne National Laboratory, USA, ayakovenko@aps.anl.gov

J.A. Kaduk, Polycrystallography, Inc., and Illinois Institute of Technology, USA, kaduk@polycrystallography.com

K.M. Wiaderek, S. Lapidus, APS – Argonne National Laboratory, USA, kwiaderek@aps.anl.gov, slapidus@aps.anl.gov

Software: GSAS-II

Today, structure determination and structure analysis of new materials is one of the routine tasks which needs to be performed in order to understand the materials properties. The majority of structure determinations are carried out by single crystal methods. Materials that are being used in the industrial and/or commercial settings are, however, generally in polycrystalline form. While new structure solution using powder diffraction data may be complicated, powder diffraction can be easily used for in situ and operando structural studies once structural models are known. This enables a better understanding of the material structure and microstructure, and their evolution at real applicable conditions. In situ powder diffraction methods should become a new popular second step after initial structure determination due to recent advantages in sequential and parametric Rietveld analysis.

The 2017 Rietveld Refinement workshop, in addition to “classical” single pattern data refinement, will be focused on strategies of in situ data processing. We will explore carbon monoxide oxidation process and will see what structural changes happen inside Cu/Cu₂O catalyst. About one quarter of the time will be spent describing how to use other structural techniques such as pair distribution function analysis (PDF) to extract structural information where the Rietveld method might not yield the desired results.

Handheld XRF – The Silver Bullet or Fool’s Gold?

North Mammoth - Mountain Mall

Organizer & Instructors:

M. Loubser, GeoMagGeoChem, South Africa, maggi.loubser@gmail.com

N. Brand, Geochemical Services Pty Ltd, Australia, nwbrand@bigpond.net.au

S. Ridolfi, Ars Mensurae, Italy, stefano@arsmensurae.it

X-ray Fluorescence spectroscopy is a mature technique with the theory well described and routinely applied in process control, exploration, mining and manufacturing apart from research and development applications. The “big shrink” as in most analytical technologies was the result of improved electronics and computer chips, and together with the advance of the SDD detector Energy Dispersive XRF was ready to enter the playground. Handheld XRF moved from a metal sorting scanner to an actual quantitative analytical tool. But here lies the biggest challenge; because of reduced cost and ease of operation this tool is now more accessible to people who often do not have the insight in the limitations.

In this workshop, firstly the differences between analysis in the field vs. the laboratory would be explained, and methods to improve accuracy or interpret the data based on the known inaccuracies. Then some specific Geology case studies would be presented by Nigel Brand. Lastly, Stefano Ridolfi will introduce some case studies in the field of art and conservation where the ability to bring a non-destructive technique to the actual object probably had the biggest impact, but again, not without pitfalls.

Challenges in XRF Analysis: Sample Preparation, Spectral Interpretation and Soft X-ray Detection

South Mammoth - Mountain Mall

Organizer & Instructors:

J. Kawai, Kyoto University, Japan, kawai.jun.3x@kyoto-u.ac.jp

Y. Uehara, Mitsubishi Electric Corporation, Japan, uehara.yasushi@aj.mitsubishielectric.co.jp

S. Ichikawa, Fukuoka University, Japan, sichikawa@fukuoka-u.ac.jp

This workshop provides a technical introduction on the following topics:

1. The sample preparation (sample amount, particle size for e.g. rice as received or pulverized based on escape depth of fluorescent X-ray, pressure to make a briquette, glass bead components and thickness, specimen diameter, synthetic standard for calibration curve, validation using reference materials ...)
2. Spectrometer settings (A/D conversion gain, smoothing, background subtraction, dwelling time, iteration time, WDX or EDX, X-ray intensity and counting rate, sum peak, escape peak, diffraction peak, shaping time ...)
3. Measurement conditions (sample thickness, monochromatic X-ray energy, incident X-ray beam angle ...) which will affect the results of quantitative and even qualitative results of XRF. Though synchrotron radiation XRF and EPMA are compared with ordinary laboratory or handheld XRF spectrometers, the workshop is intended to make use of ordinary laboratory XRF spectrometer’s high reliability. This workshop is intended not only for XRF beginners but also for those already familiar with XRF measurements.

Quantitative Analysis I

Lamar/Gibbon - Yellowstone Conf. Ctr.

Organizer & Instructors:

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

B. Vrebos, PANalytical B.V., The Netherlands, bruno.vrebos@panalytical.com

K. Kawakyu, Rigaku Corporation, Japan, kawakyu@rigaku.co.jp

B. Scruggs, Ametek/EDAX, USA, bruce.scruggs@ametek.com

Morning:

Matrix effects and how to compensate for them: scatter peaks, compensation methods, semi-quantitative analysis using FP, and fusion.

Afternoon:

Introduction to mathematics and physics of XRF quantification, including matrix effects, spectrum processing, artifacts, instrument settings, and element sensitivity & detection limits.

Tuesday Afternoon Workshops 1:30 pm – 4:30 pm

Strain & Phase Mapping of Industrial Materials & Processing by Synchrotron **North Mammoth - Mountain Mall**

Organizer & Instructors:

T. Tsakalakos, Rutgers University, USA, tsakalak@gmail.com

J. Okasinski, APS - Argonne National Laboratory, USA, okasinski@aps.anl.gov

W.A. Paxton, Ford Motor Company, USA, wpaxton@ford.com

This workshop will focus on the general principles of strain and phase mapping using synchrotron radiation to interrogate a wide range of advanced engineering materials. X-ray diffraction can be utilized to systematically and comprehensively understand the effects of processing and the resultant evolution of structure on the overall mechanical properties, performance, and thermal stability for materials. Standardized procedures for the testing and analyses of size-dependent mechanical and functional properties at the nanoscale, which are essential for the design, modeling, and life assessment of advanced engineering materials for structural and functional applications, will also be addressed.

Unique experimental techniques, in particular energy dispersive X-ray diffraction (EDXRD), will be reviewed in this workshop for the in situ and ex situ characterization of the structure, residual stresses, and fracture and fatigue response. Systematic and well-executed experiments to investigate monotonic and cyclic deformation and failure across nanometer to macroscopic length scales are discussed in carefully chosen and synthesized model systems. We will discuss techniques to directly measure the residual stress tensor in materials as a function of depth, to correlate the residual stress profiling to deformation and fracture processes of advanced engineering materials and to relate deformation modes to structural parameters.

Rietveld Refinement using In Situ Powder Diffraction Data II **Amphitheatre - Yellowstone Conf. Ctr.**

Please see previous description from Rietveld Refinement using In Situ Powder Diffraction Data I, page 15.

Sample Preparation of XRF **South Mammoth - Mountain Mall**

Organizer & Instructors:

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

J. Pitre, Claisse, Canada, jpitre@claisse.com

This workshop will begin with John Anzelmo discussing the fundamental physics of sample preparation, such as infinite thickness and effective layer thickness, particle size effects, mineralogical effects, grinding concepts, and how to make the basic laboratory operations involved in solving these problems for XRF specimen preparation of pressed powders and fusion beads. Janice Pitre will discuss basic and advanced fusion techniques, such as selection of flux for different applications, conditions that cause cracking in beads, and oxidation techniques for simple and difficult to flux materials.

Quantitative Analysis II **Lamar/Gibbon - Yellowstone Conf. Ctr.**

Please see previous description from Quantitative Analysis I, page 15.

XRD Poster Session – Monday Evening

Huntley Dining Room - Yellowstone Conf. Ctr.

The Monday evening XRD poster session will be held 5:00 pm – 7:00 pm in the Huntley Dining Room, in conjunction with a wine and cheese reception. Three “Best Poster” awards will be given at the end of the session, including “Best Student Poster”. Judges: **T.R. Watkins**, Oak Ridge National Laboratory, USA, watkinstr@ornl.gov
M.A. Rodriguez, Sandia National Laboratory, USA, marodri@sandia.gov

**Signifies presenting author, when noted*

- D-1** **The Rietveld of Teaching Materials for Ceramic**
J.R. Marques, J.F. dos R. Sobrinho, A.R. do N. Santos. A. de S. Brandim, Instituto Federal do Piauí - IFPI, Brasil
R. Barbosa, Universidade Federal do Piauí - UFPI, Brasil
- D-2** **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
- D-4** **Structure Investigation of Lignin-based Polyurethanes using WAXS**
K. Walbrueck, S. Klein, J. Rumpf, M. Schulze, S. Witzleben, Bonn-Rhein-Sieg University, Germany
- D-6** **Dilithium (Citrate) Crystals and Their Relatives**
J.A. Kaduk, A.J. Cigler, North Central College, USA
- D-7** **Crystal Structures of Large-Volume Commercial Pharmaceuticals**
J.A. Kaduk, Illinois Institute of Technology and North Central College, USA
A.M. Gindhart, T.N. Blanton, ICDD, USA
- D-8** **Determination of Crystallite Size and Strain: A Comparison of Different X-ray Diffraction Techniques**
J. Shi, A. Takase, Rigaku Americas, USA
- D-9** **A High-Quality Non-Destructive XRD Technique for Cultural Heritage**
G.M. Hansford*, S.M.R. Turner, University of Leicester, UK
P. Degryse, K.U. Leuven, Belgium
A.J. Shortland, Cranfield University, UK
- D-14** **Atom Dynamic of Amorphous Materials ($(\text{Ni}_{0.60}\text{Nb}_{0.4})_{100-x}\text{Zr}_x$ ($x=0$ 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
- D-15** **Finger Print Minerals for Provenance Estimation of Atamadai Type Pottery (2500-1500 BC) from Hinoki Site (Tochigi, Japan) using Powder XRD**
S. Ichikawa*, M. Morikawa, T. Kurisaki, T. Yamaguchi, Fukuoka University, Japan
- D-19** **Residual Stress Analysis of Coated Carbides at Kennametal, Inc.**
T. Shibata*, B. Sargent, Kennametal Inc., USA
- D-25** **Investigation of Polymer Coating Morphology with XRD**
P. Ricou*, A. Du, Z. Cherian, Arkema, Inc., USA
- D-26** **Time Resolved X-ray Diffraction Study of the Growth of Nitrate-Induced Droplets**
Y.I. Kim, K.B. Kim, Y.H. Lee, Korea Research Institute of Standards and Science, Republic of Korea
K.M. Nam, Mokpo National University, Republic of Korea
- D-30** **Synchrotron Powder Diffraction Simplified: The High-Resolution Diffractometer 11-BM at the Advanced Photon Source**
L. Ribaud, S. Lapidus, Argonne National Laboratory, USA

WITHDRAWN

- D-31** **Materials Characterization Using Synchrotron Radiation Capabilities of the ICDD PDF-4 Databases**
T. Blanton, T. Fawcett, J. Blanton, S. Kabekkodu, R. Papoular, ICDD, USA
- D-32** **Phase Transformation and Enhancement of Structural Properties on CdSe Films with Annealing in Air Atmosphere**
J. Sarmiento, E. Rosendo, T. Díaz-Becerril, R. Romano-Trujillo, CIDS, BUAP, México
W. De la Cruz, CNYN, UNAM, México
- D-33** **Materials Characterization Using Neutron Radiation Capabilities of the ICDD PDF-4 Databases**
T. Blanton*, J. Faber, J. Blanton, S. Kabekkodu, R. Papoular, ICDD, USA
- D-35** **Determination of Contrast Factors for Cubic Slip-Systems and their Application in the Microstructural Characterization of Binary Fm-3m Materials**
D. Cavazos-Cavazos, F.F. Contreras-Torres, Tecnológico de Monterrey, Mexico
- D-36** **Hydrotalcites as a Carbon Sink in Serpentinites**
C.C. Turvey*, S.A. Wilson, J.L. Hamilton, Monash University, Australia
J. McCutcheon, G. Southam, The University of Queensland, Australia
A. Beinlich, Curtin University, Australia
G.M. Dipple, The University of British Columbia, Canada
- D-38** **Determination of Clay Minerals by the Rietveld Refinement**
M. Kasari*, D. Fukuda, K. Fujii, Y. Koike, Meiji University, Japan
A. Ohbuchi, Rigaku Corporation, Japan
- D-39** **Powder XRD Investigations and Structure of a New Layered Silicate Material**
M.A. Miller, S.R. Miller, R.W. Broach, Honeywell UOP, USA, B. Lyons, C.L. Nicholas*, C.P. Nicholas,
- D-50** **Feasibility Study of Manufacturing TiAl Parts with Electron Beam Melting: A Pathway Towards Additively Manufacturing Complex Engine Components**
E. Cakmak, P. Nandwana, T. Watkins, A. Haynes, Oak Ridge National Lab, USA
R. England, Cummins Inc., USA
- D-51** **Synthesis of Li-Sn-Zn Ternary Alloy**
C. Saw, B. Choi, Lawrence Livermore
- D-52** **A New 3D Framework Supported in Dipole-Dipole Interactions: Intercalation of Thiazole in Layered Solids**
F. Echevarría, A.A. Lemus-Santana, L. Reguera, Research Institute in Advanced Science and Applied Technology, México
J. Rodríguez, Research Center in Advanced Chemistry, México
- D-56** **Porphyryns: Important Materials with Diverse Functionalities**
L. Cook, G. Brewer, The Catholic University of America, USA
W. Wong-Ng, National Institute of Standards and Technology, USA
- D-61** **Disordered and Non-crystalline Phase Quantification by Whole-pattern Fitting in Environmental Materials**
T.J. Kane*, University of Colorado at Boulder, USA
K.M. Campbell, U.S. Geological Survey
- D-64** **In Operando / Situ Data Collection and Advanced Data Analysis of a Commercial Li-Ion Battery During Charge/Discharge Cycles on a XRPD Laboratory Diffractometer**
T. Degen, M. Gateshki, M. Sadki, D. Beckers, PANalytical B.V., The Netherlands
- D-65** **STOE STADI P and the MULTI-MYTHEN – The Solution if One Dectris MYTHEN 1K is Not Fast Enough**
T. Hartmann, Stoe & Cie GmbH, Germany
- D-67** **Atomic Pair Distribution Function (PDF) and X-ray Scattering Methods to Assess the Stability of Amorphous Organic Compounds**
D. Beckers, M. Gateshki, PANalytical B.V., The Netherlands
A. Adibhatla, PANalytical Inc., USA
- D-70** **Crystallite Size Analysis of Nanomaterials by Single Peak and Whole Pattern Fitting**
J. Cowen, Case Western Reserve University, USA

- D-71** **The High-Temperature Stability and Crystal Structure of Cadmium-Doped Hydroxyapatite Powders**
M. Shah, G. Gonzalez, DePaul University, USA
- D-72** **Relationships between Optical and DRX Characteristics of Cu²⁺/Fe³⁺ Mixed Oxides**
S. Nieto-Zambrano, E. Ramos-Ramirez, University of Guanajuato, Mexico
- D-73** **How Low Can You Go? Exploring Lowest Detection Limits of Respirable Crystalline Silica**
N. Rodesney*, N. Henderson, J. Giencke, B. Jones, Bruker AXS, USA
- D-77** **D2 PHASER Benchtop Diffractometer: New Components Boost Performance**
N. Henderson*, S.N. Rodesney, J. Giencke, B. Jones, Bruker AXS, USA
A. Kern, Bruker AXS, Germany
- D-81** **Structural Characterization of GaN Layers Grown on Graded-AlGaIn/GaN/c-Al₂O₃ 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
- D-85** **Shear Stress Measurement with Portable X-ray Device**
S.Y. Lee, Columbia University, USA
- D-88** **Diffuse Scattering from Nanoparticles**
S. Xiong, I.C. Noyan, Columbia University, USA
- D-90** **Method Development for X-ray Diffraction Analysis of Thin Powder Deposit Samples of Simulated Radioactive Tank Waste**
T. Ely, H. Meznarich, T. Valero, G. Cooke, Washington River Protection Solutions LLC, USA
- D-91** **Alloying Large Organic Cations into the Band Structure for Enhanced Thermal Stability and Transport Properties**
W. Peng, X. Miao*, O.M. Bakr, **Moved to Thursday General XRD Session**, Ministry of Science and Technology (KAUST), Saudi Arabia
- D-95** **MetalJet Technology and Applications in XRD and SCD**
E. Espes*, J. Hällstedt, U. Lundström, B.A.M. Hansson, O. Hemberg, M. Otendal, T. Tuohimaa, P. Takman, Excillum AB, Kista, Sweden
- D-96** **P- type Behavior of Antimony Doped ZnO Nanowires Studied By X-ray Absorption Spectroscopy and Photoluminescence**
A.M. Alsmadi, B. Salameh, Kuwait University, Kuwait **WITHDRAWN**
- D-98** **Metals & Alloys Structure Types in the PDF4+ - A Progress Report**
P. Wallace , J. Dann, C. Foris, C. Hubbard*, H. Jones, A. Roberts, E. Ryba, ICDD Metals and Alloy Working Group

Post Deadline Posters

- D-97** **Facile Synthesis of Sb₂(S_{1-x}Se_x)₃ Solid Solution by Molecular Precursor Route and Band Gap Tuning**
M.D. Khan,* N. Revaprasadu, University of Lagos, Nigeria **WITHDRAWN**
M.A. Malik, University of Manchester, UK
- D-99** **Preparation and Characterization of Fiber Textured Copper Thin Films**
Q. Lin, University of California Irvine, USA
- D-100** **Order Parameters of OLED Thin Films Using GIWAXS**
C. Lor*, A. Hexemer, Lawrence Berkeley National Lab, USA
K. Kearns, Y. Huang, J.C. Lin, DOW Chemical, USA
- D-101** **Estimation of Grain Size in Pharmaceutical Tablets by Two-Dimensional X-ray Diffractometry**
N. Thakral*, Upsher Smith Lab LLC, USA
S. Thakral, R. Suryanarayanan, University of Minnesota, USA

XRF Poster Session – Tuesday Evening

Huntley Dining Room - Yellowstone Conf. Ctr.

The Tuesday evening XRF poster session will be held 5:00 pm – 7:00 pm in the Huntley Dining Room, in conjunction with a wine and cheese reception. Three “Best Poster” awards will be given at the end of the session, including “Best Student Poster”.

Judges: **M. Loubser**, GeoMagGeoChem, South Africa, maggi.loubser@gmail.com
M. Schmeling, Loyola University Chicago, USA, Mschmel@luc.edu

**Signifies presenting author, when noted*

- F-2** **XRF Elemental Analysis from Raw Materials to Coated Carbides - Case of Kennametal. Inc**
P. Kalvala, A. Comar, B. Sargent, T. Shibata*, Kennametal Inc., USA
- F-3** **Rapid Quantitative Analysis of Silicon, Calcium, Chromium, Manganese and Iron in Ferrosilicon by Benchtop EDXRF**
D.W. Cheng*, M.B. Liu, X.L. Liao, Z.Y. Ni, X.J. Shen, Y.H. Jia, NCS Testing Technology Co., Ltd., China
- F-4** **Depth Resolved Chemical Speciation of a Superlattice**
G. Das, M.K. Tiwari, Raja Ramanna Centre for Advanced Technology, and Homi Bhabha National Institute, India
A. Khooha, A.K. Singh, Raja Ramanna Centre for Advanced Technology, India
- F-7** **Recent Modifications to the Software of a Miniature X-ray Fluorescence Spectrometer for Radiological Glovebox Applications**
D.M. Missimer*, P.E. O'Rourke, C.E. Brown, Savannah River National Laboratory, USA
- F-12** **Elemental Mapping of Strontium in Rat Bones Treated with Strontium Ranelate and Strontium Citrate using 3D Dual Energy X-ray K-edge Subtraction Imaging**
D.A. Cardenas, A. Pejovic-Milic*, Ryerson University, Canada
D. Cooper, A. Panahifar, University of Saskatchewan, Canada
G. Wohl, McMaster University, Canada
- F-16** **Versatile Filtering of Charge Sharing in Commercial sCMOS Camera for X-ray Fluorescence Analysis**
W. Zhao, University of Tsukuba, Japan
K. Sakurai, National Institute for Materials Science, Japan
- F-18** **X-ray Analysis of Fouling from CFBC**
Y. Kim*, Korea Advanced Institute of Science and Technology, Republic of Korea
K. Park, J. Park, G. Lee, D. Lee, H. Kim, D. Bae, K. Han, D. Shun, Korea Institute of Energy Research, Republic of Korea
- F-20** **A New Scale in the Technology of Polycapillary Optics**
A. Bjeoumikhov; S. Bjeoumikhova; M. Thiel, IFG / Fischer Technology, Inc., Germany
- F-21** **Characterization of Food Contaminants through Micro-XRF**
R. Novetsky, Bruker AXS, Inc., USA
- F-23** **Investigating the Effects of Micro-XRF Analysis on Common Geochemical Compounds**
S. Menachekanian, California State Polytechnic University, USA
D. Flannery, R. Hodyss, A. Allwood, K. Williford, Jet Propulsion Laboratory, USA
C. Heirwegh, Caltech/Jet Propulsion Laboratory, USA
C.S. Jamieson, Glendale Community College, USA
- F-28** **Characterization of Sub-Log Scale Variability in Mudstones and the Effects of Variable Sampling Scales on High Resolution Models; Examples from Bone Spring Formation, West Texas**
A. Morrell*, S. Narasimhan, H. Rowe, P. Mainali, Premier Oilfield Laboratories, USA
- F-29** **X-ray Fluorescence Analysis in an Electron Microprobe with a Reduced Spotsize of Polycapillary Focusing Optics at the IfG Modular X-ray Source (iMC)**
M. Menzel, A. Bjeoumikhov, IFG - Ionische Fachhochschule für Angewandte Wissenschaften GmbH, Germany
- F-30** **All-new Versatile Silicon Drift Detector and Preamplifier Combination for Industrial Applications**
E. Lechner, R. Fojt, J. Knobloch, C. Luckey, A. Pahlke, S. Pahlke, N. Willems*, KETEK GmbH, Germany
- F-35** **Sample Preparation for TXRF Analysis using Resist Pattern Technique**
K. Tsuji, N. Yomogita, Osaka City University, Japan
Y. Konyuba, JEOL, Japan
- F-36** **Diamond X-ray Lens Development**
R. Kostin, Euclid Techlabs, USA

WITHDRAWN

- F-37 Electrodeless, Non-invasive X-ray Flux Monitor**
S. Kuzikov, Euclid Techlabs, USA
A. Vikharev, Institute of Applied Physics, Russia
S. Stoupin, Chess, Cornell University, USA
- F-38 MOXTEK MXDPP-60: OEM DPP Performance Characterization**
A. Stratilatov, R. Creighton, J. Van Wagoner, C. Carter, J. Wong, S. Kamtekar, Moxtek, Inc., USA
- F-44 Silicon Drift Detectors for High Speed X-ray Applications**
M. Zhang, S. Barkan, V.D. Saveliev, L. Feng, Y. Wang, B. Goolsby, E.V. Damron, Hitachi High-Technologies Science America, Inc., USA
- F-45 Calculation of Fluorescent X-ray Intensity for Confocal micro-XRF Analysis of Inhomogeneous Samples – Part 2**
N. Kawahara*, R. Hosomi, S. Mita, K. Tsuji, Osaka City University, Japan
- F-50 120 kV & 5 Watt Compact X-ray** **WITHDRAWN**
S. Cornaby, G. Smith, R. Steck, B. [REDACTED], S. Kamtekar, Moxtek Inc., USA
- F-51 On-line Determination of Rare Earth Distribution by Energy Dispersive X-ray Fluorescence Spectrometry**
L. Hongwei, Beijing, China
- F-52 X-ray Fluorescence Computed Tomography at SSRF**
B. Deng, B. Feng, G. Du, H. Xie, T. Xiao, SSRF, China
- F-54 Differentiation and Quantification of Sulfur Species by X-ray Fluorescence (WDX)**
S. Uhlig, A. Plessow, TU Bergakademie Freiberg, Germany
R. Möckel, Helmholtz-Institute Freiberg for Resource Technology, Germany
- F-57 PWM Implementation of a Grid Controlled Microfocus X-ray Tube**
C. McKenzie, A. Degtraryov, Y. Alivov, M. Chidambaram, B. Grigsby, Oxford Instruments, USA
- F-58 Novel Clustering Approach for the Segmentation of Elemental Distributions in Human Bone**
M. Rauwolf*, A. Turyanskaya, P. Wobrauschek, C. Strel, Atominstutit - TU Wien, Austria
A. Roschger, Max Planck Institute of Colloids and Interfaces, Germany
P. Roschger, Hanusch Hospital, Austria
J.G. Hofstaetter, Orthopaedic Hospital Vienna-Speising, Austria
- F-61 Application of SR-TXRF-XANES for the Analysis of Indoor Aerosol Samples at BESSYII and ELETTRA**
J. Prost, A. Zinkl, D. Ingerle, P. Wobrauschek, C. Strel, Atominstutit - TU Wien, Austria
D.M. Eichert, W.H. Jark, ELETTRA – Sincrotrone Trieste, Italy
G. Pepponi, Fondazione Bruno Kessler, Italy
A. Migliori, A.G. Karydas, M. Czyzycki, International Atomic Energy Agency, Austria
A. Guilhaume Buzanich, U. Reinholz, H. Riesemeier, M. Radtke, Federal Institute for Materials Research and Testing, Germany
- F-62 Total-reflection X-ray Fluorescence Analysis of Airborne Particulate Matter Samples**
A. Zinkl, J. Prost, J.H. Sterba, P. Wobrauschek, C. Strel, Atominstutit - TU Wien, Austria
- F-65 Comparison of Synchrotron-Induced X-ray Fluorescence with ED-XRF on the Elemental Analysis of Air Pollution Samples**
N. Spada, S. Yatkin, K. Trzepla, N. Hyslop, University of California, Davis, USA
M. Czyzycki, IAEA, Austria and AGH University of Science and Technology, Poland
- F-66 Determination of Airborne Mercury using Ag-nano Particles Assisted TXRF**
S. Böttger, D. Rosenberg, M. Busker, W. Jansen, Europa-Universität Flensburg, Germany
I.M.B. Tysebotn, U.E.A. Fittschen*, Washington State University, USA
- F-67 Interlaboratory Comparison of Reference Materials and Air Samples Analyzed by XRF and ICP-MS**
S. Yatkin, K. Trzepla, V. Celso, W. White, N. Hyslop, University of California, Davis, USA
E. Dabek-Zlotorzynska, Environment and Climate Change Canada, Canada
- F-68 Measuring Ultra-Low Phosphorus in Gasoline**
J. Sedlmair, Bruker AXS Inc., USA
- F-69 Implementation of a Confocal SR-microXRF System for Bone Analysis at the X-ray Fluorescence Beam Line at Elettra**
A. Turyanskaya, L. Perneczky, M. Rauwolf, P. Wobrauschek, C. Strel, Atominstutit - TU Wien, Austria
D. Eichert, F. Brigidi, W. Jark, Elettra Sincrotrone Trieste, Italy
S. Bjeoumikhova, IFG, Institute for Scientific Instruments GmbH, Germany
G. Pepponi, Fondazione Bruno Kessler, Italy
P. Roschger, Hanusch Hospital, Austria

- F-70 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. Strel, Atominstytut, 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
- F-72 XRF Result Repeatability Across Multiple Uncalibrated Instrument Components**
J. Van Wagoner, S. Cornaby, S. Kamtekar, K. Kozaczek, Moxtek, USA
- F-75 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
- F-76 Development of a Novel CE-XRF System for the Determination of Elemental Contaminants and Their Speciation in Complex Water Systems**
I.M.B. Tysebotn, A. Fittschen*, U.E.A. Fittschen, Washington State University, USA
- F-77 In-vivo Micro-XRF to Study Rubidium Uptake in Plants**
U.E.A. Fittschen, A. Fittschen*, R. Hoehner, H.-H. Kunz, Washington State University, USA
- F-79 On-line Analysis of Potassium Chloride on a Conveyor Belt using XRF Combined with Distance Correction Method**
X. Zhang, Y. Zhang, Z. Kong, Q. Shan, W. Jia, Nanjing University of Aeronautics and Astronautics, China
- F-82 Total Reflection X-ray Fluorescence Analysis of Oysters**
L. Borgese*, R. Dalipi, L.E. Depero, University of Brescia, Italy
- F-83 Optimized High Energy Performance of Polycapillary Optics for μ XRF Analysis**
J. Sachs, N. Gao, XOS, USA
R. Magyar, Bowman XRF, USA
- F-84 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
- F-85 Chemical and Structural Analysis of Cl in the Cement Industry**
A. Riboldi, M. Brisotto, L. Borgese*, U.E.A. Fittschen, L.E. Depero, University of Brescia, Italy
E. Bemporad, University of Rome Tor Vergata, Italy
- F-86 Measure Low Concentrations of As, Se and Pb in Water by MWDXRF**
X. Zhang, T. Tongue, Z. Chen, X-ray Optical Systems, USA
- F-87 New Reference Samples for X-ray Spectrometry**
R. Dietsch*, T. Holz, M. Krämer, D. Rogler, D. Weissbach, AXO DRESDEN GmbH, Germany
B. Beckhoff, P. Hoenicke, PTB, Germany
T. Krugmann, University of Hamburg, Germany
D. Rosenberg, University of Flensburg, Germany
- S-32 Study of Carbon Bonding with XES using a TES Microcalorimeter Detector**
K. McIntosh*, G. Havrilla, M. Croce, R. Huber, D. Podlesak, M. Rabin, Los Alamos National Laboratory, USA
F. Vila, University of Washington, USA
M. Carpenter, R. Cantor, Star Cryoelectronics, USA
- S-59 Alpha Particle X-ray Spectrometry for the Analysis of ^{238}Pu in the Curiosity Mars Rover**
A. Patel, Physical Research Laboratory, India

WITHDRAWN

WITHDRAWN

Post Deadline Posters

- F-89 Matrix Correction for Improving the Calibration Accuracy of FP Model**
X. Chen*, P. Hardman, Olympus, USA
J. Habermehl, Olympus, Canada
- F-90 The Energy Dispersive Scheme of X-ray Fluorescence Analysis with a Crystal Polarizer and Polycapillary Optics**
A.G. Turyanskiy, V.M. Senkov, P.N. Lebedev Physical Institute RAS, Russian Federation
S.S.* Gizha, Ya.M. Stanishevskiy, RUDN University, Russian Federation
- F-91 Development of Portable XRF, XRD and XRT, and Introduction of 2 Dimensional Detectors with Small Pixel Size and High Energy Resolution**
K. Nishihagi*, K. Tantrakarn, K. Taniguchi, Techno-X Co., Ltd., Japan
- F-92 New Developments in Multi-Sensor Silicon Drift Detectors**
D. Redfern*, P. Smith, B. Daniel, M. Gray, RaySpec Ltd, UK

Plenary Session – Wednesday Morning, 2 August

8:30 am – 11:45 am

Talus Room - Summit Hotel

Inspecting the Infrastructure – Safeguarding with X-rays

Chairs: **C. Murray**, IBM T.J. Watson Research Center, USA, conal@us.ibm.com

D. Broton, CTLGroup, USA, dbroton@ctlgroup.com

8:30

Welcoming Remarks & Awards:

Introduction of the new Chairman of the Denver X-ray Conference, **Tim Fawcett**, Emeritus, ICDD, USA, by Past Chairman, **W. Tim Elam**, University of Washington, USA

2017 Jenkins Award presented to **James Kaduk**, Polycrystallography, Inc and Illinois Institute of Technology, USA. Presented by **Tim Fawcett**, Chairman of the Jenkins Award Selection Committee, Emeritus, ICDD, USA

2017 Barrett Award presented to **Daniel Louër**, France. Presented by **Conal Murray**, Chairman of the Barrett Award Selection Committee, IBM, USA. Dr. Louër will be unable to attend DXC and will accept the award at the ICDD Annual Meetings in 2018.

2017 Jerome B. Cohen Student Award winner to be announced by Chairman of the Cohen Award Selection Committee, **I. Cev Noyan**, Columbia University, USA

2017 Robert L. Snyder Student Awards to be announced by **Tom Blanton**, Executive Director, ICDD, USA

2017 ICDD Fellow Award presented to **Thomas R. Watkins**, Oak Ridge National Laboratory, USA. Presented by **Tom Blanton**, Executive Director, ICDD, USA

Plenary Session remarks by the Chairs, **Conal Murray** and **Don Broton**

Invited Talks

- 9:00 P-3 Hydraulic Cements for Construction: Cementitious Materials, Standards, Specifications, and X-ray Analysis
P. Stutzman, National Institute of Standards and Technology, Gaithersburg, MD, USA
- 9:45 P-2 The Role of Chemistry in Materials Verification and Troubleshooting
G. Seegebrecht, Concrete Consulting Engineers, LLC, West Chester, IL, USA
- 10:30 Break
- 11:00 P-1 Neutron Diffraction and the Art of Infrastructure Maintenance
I.C. Noyan, Columbia University, New York, NY, USA

Oral Sessions, Wednesday Afternoon, 2 August

**Signifies presenting author, when noted*

New Developments in XRD/XRF Instrumentation I

North Mammoth - Mountain Mall

Chairs: **T.N. Blanton**, International Centre for Diffraction Data, USA, tblanton@icdd.com

T. Fawcett, Emeritus, International Centre for Diffraction Data, USA, dxcfawcett@outlook.com

- 1:30-1:42 S-4 Geometry and Algorithms to Expand 2theta Coverage of 2D Detector
B. He, Bruker AXS, USA
- 1:43-1:55 S-15 Simultaneous X-ray Fluorescence and Diffraction Imaging with the Color X-ray Camera
J. Davis*, **J. Schmidt**, **M. Huth**, **H. Soltau**, PNDetector, Germany
R. Hartman, **L. Strüder**, PNSensor, Germany
- 1:56-2:08 S-16 STOE STADI P and the MULTI-MYTHEN – Fastest Data Collection, Not Only for In-Situ Experiments
T. Hartmann, Stoe & Cie GmbH, Germany
- 2:09-2:21 S-43 Latest Development of Multilayer Optics for Analyzers and Probe Beam Solutions at Rigaku Innovative Technologies
N. Grupido, **B. Verman**, **Y. Platonov**, **L. Jiang**, Rigaku Innovative Technologies, Inc., USA
- 2:22-2:34 S-56 Pixirad: Unique Hybrid Pixel Technology for X-ray Diffraction, Scattering and Imaging
M. Franssen*, **A. Noordermeer**, **E. Reuvekamp**, **R. de Vries**, **J. Bolze**, **F. Masiello**, PANalytical B.V., The Netherlands
A. Brez, **M. Minuti**, **M. Pinchera**, **G. Spandre**, Pixirad srl and Istituto Nazionale di Fisica Nucleare, Italy
R. Bellazzini, PANalytical, Pixirad and INFN, Italy

- 2:35-2:47 S-8** Improved Performance of Silicon Drift Detectors
A. Pahlke*, **R. Fojt**, **M. Fraczek**, **L. Höllt**, **J. Knobloch**, **N. Miyakawa**, **J. Rumpff**, **O. Scheid**, **A. Simsek**, KETEK GmbH, Germany
- 2:48-3:00 S-9** New Developments in ED-XRF Technology Enable Highly Precise Elemental Analyses
D. Sachter, **D. Wissmann**, SPECTRO Analytical Instruments GmbH, Germany
M. Daniel-Prowse*, SPECTRO Analytical Instruments Inc., USA
- 3:00** **Break**
- 3:30-3:42 S-18** More Features, Improved Integration, HighScore(Plus) V4.6 and Beyond
T. Degen, **M. Sadki**, **E. Bron**, PANalytical B.V., Netherlands
- 3:43-3:55 S-48** Fast X-ray Sorting for Recycling Light Metals: A Low Cost High Throughput In-Line X-ray Fluorescence Scrap Metal Sorter
M. Garcia, **N. Kumar**, nanoRANCH-UHV Technologies, Inc., USA
- 3:56-4:08 S-53** New Innovations in the D2 PHASER Benchtop Diffractometer
B. Jones*, **N. Henderson**, **S. Rodesney**, **J. Giencke**, Bruker AXS, USA
A. Kern, Bruker AXS, Germany
- 4:09-4:21 S-23** Aeris- PANalytical's New Benchtop XRD with Best in Class Performance
J. Quinn, PANalytical Inc., USA
H. van Weeren, **M. Fransen**, PANalytical BV, The Netherlands
- 4:22-4:34 S-52** D8 ADVANCE Plus: The Newest Member of the D8 Family of Solutions
J. Giencke, **B. Jones**, **N. Henderson**, **N. Rodesney**, Bruker, USA
- 4:35-4:47 S-57** Improving Handheld XRF Performance in Geological Samples
M. Cameron, Bruker Elemental, USA
- 4:48-5:00 S-38** Newly Developed Compact X-ray Sources
S. Cornaby, **T. Parker**, **R. Steck**, **B. Harris**, **K. Kozaczek**, **C. Smith**, **E. Miller**, **S. Kamtekar**, Moxtek Inc., USA

Stress and Infrastructure

Amphitheatre - Yellowstone Conf. Ctr.

Chair: **T.R. Watkins**, Oak Ridge National Laboratory, USA, watkinstr@ornl.gov

- 1:30 D-92** Invited: Complementary Residual Stress Measurement Techniques
M.L. Steinzig*, **M.B. Prime**, **T.A. Sisneros**, **B. Clausen**, **C.F. Chen**, **J. Dereskiewicz**, Los Alamos National Laboratory, USA
- 2:00 D-49** Spatially Resolved Texture and Microstructure Evolution of Gas Gun Deformed SUS304 Steel Using Neutron Diffraction
S. Takajo*, **C.P. Trujillo**, **D.T. Martinez**, **B. Clausen**, **D.W. Brown**, **S.C. Vogel**, Los Alamos National Laboratory, USA
- 2:20 D-86** Precision and Accuracy of Stress Measurement with a Portable X-ray Machine
S.Y. Lee*, **S. Wang**, Columbia University, USA
J. Ling, **J. Ramirez-Rico**, Universidad de Sevilla, Spain
- 2:40 D-21** Asymmetrical Reciprocal Space Mapping using X-ray Diffraction: A Technique for Structural Characterization of III-nitride Nanostructures
A. Kuchuk, University of Arkansas, USA
- 3:00** **Break**
- 3:30 D-87** Strain Determination in Nanoparticles
S. Xiong, **I.C. Noyan**, Columbia University, USA
- D-68** High-Energy Synchrotron Radiation X-ray Diffraction Measurements for Phase and Residual Strain Mapping of Friction-Stir Processed Beta Titanium
M. Carl, **M.L. Young**, University of Tennessee, USA
- 3:50 D-20** Validation of the Material Removal Correction for Residual Stress Measurement Results Obtained Using X-ray Diffraction Techniques
J. Pineault*, **M. Bolla**, **M. Belassel**, Proto Manufacturing Ltd., Canada
M. Brauss, Proto Manufacturing Inc., USA
- 4:10 D-17** Residual Stress Measurement of Polyethylene Pipes with Two-Dimensional X-ray Diffraction
M. Ren, **C. Zheng**, **Y. Shi**, **L. Liu**, Sinopec Beijing Research Institute of Chemical Industry, China
B.B. He, Bruker AXS, Inc., USA

WITHDRAWN

Chair: **A. Huq**, Oak Ridge National Laboratory, USA, huqa@ornl.gov

- 2:00 D-13** Invited: The Impact of the Rietveld Method in Mineralogy and Geology: The Impossible is now Possible
D. Bish, Indiana University, USA
- 2:30 D-57** Routine Definition of K-feldspar Ordering Degree in Multiphase Rietveld Refinements
R. Möckel, S. Richter, J. Gutzmer, Helmholtz-Institute Freiberg for Resource Technology, Germany
U. Kempe, TU Bergakademie Freiberg, Germany
- 2:50 D-18** Invited: Powder Diffraction in the Petroleum and Petrochemical Industries
J.A. Kaduk, Illinois Institute of Technology and North Central College, USA
- 3:20 Break**
- 3:50 D-93** Invited: The Impact of Rietveld in Condensed Matter Science
C.R. Dela Cruz, Oak Ridge National Laboratory, USA
- 4:20 D-42** Synthesis and Structural Characterization of Small-pore ABC-6 Family Zeotypes
J.P.S. Mowat, G.J. Lewis, R.W. Broach, N. Greenlay, P. Jakubczak, L.M. Knight, S.R. Miller, J. Stanczyk, Honeywell UOP, USA
- 4:40 D-58** Understanding Reduction Alloying of Core-shell Nanoparticles Through In-situ Powder X-ray Diffraction
R. Koch, S. Misture, Alfred University, USA
G. Li, H. Wang, University of South Carolina, USA

Quantitative Analysis of XRF

South Mammoth - Mountain Mall

Chair: **L. Brehm**, Dow Chemical Company, USA, lbrehm@dow.com

- 1:30 F-81** Invited: The Micro Ionome of Plants: An Approach to Quantify Ion Uptake and Distribution In Vivo
U.E.A. Fittschen, A. Fittschen, R. Hoehner, W. Tramel, H.H. Kunz, Washington State University, USA
- 2:00 F-22** Reduction of Pile-up Spectra at High Input Count Rates - Mandatory for Trace Element Analysis
J. Heckel, SPECTRO Analytical Instruments GmbH, Germany
- 2:20 F-33** Calibration of a μ -XRF Prototype Instrument used in Modelling the Performance of the Planetary Instrument for X-ray Lithochemistry (PIXL) for Mars 2020
C. Heirwegh, D. Flannery, A. Allwood, Jet Propulsion Laboratory, California Institute of Technology, USA
W.T. Elam, University of Washington, USA
- 2:40 F-80** Abridged Spectral Matrix Inversion – Fitting 25,000 Spectra Per Second
A.M. Crawford*, **O. Ponomarenko, C. Simoens, G. George, I. Pickering**, University of Saskatchewan, Canada
- 3:00 F-31** Where Compton Matters
T. Wolff*, **F. Reinhardt**, Bruker Nano GmbH, Germany
F. Nitsche, Bruker AXS GmbH, Germany
D. Docenko, Consultant, Israel
- 3:20 Break**
- 3:50** Invited: Some Aspects of Fundamental Parameters Applied to XRF
B. Vrebos, Panalytical B.V., The Netherlands
- 4:20 F-56** Invited: Superconducting Microcalorimeters for X-ray Spectroscopy
J. Fowler, NIST Boulder Labs, USA
- F-64** Research of Method for Improved Quantitative X-ray Fluorescence Analysis in Coal
Y. Zhang, W.B. Jia, Q. Shan, R. Gardner, North Carolina State University, USA
- 4:50 F-47** XRF Analysis by FP Calibration Using Standards with Unknown Components
K. Kawakyu*, **T. Moriyama, Y. Kataoka**, Rigaku Corporation, Japan

WITHDRAWN

Oral Sessions, Thursday Morning, 3 August

**Signifies presenting author, when noted*

New Developments in XRD/XRF Instrumentation II

North Mammoth - Mountain Mall

Chairs: **T.N. Blanton**, International Centre for Diffraction Data, USA, tblanton@icdd.com

T. Fawcett, Emeritus, International Centre for Diffraction Data, USA, dxcfcawcett@outlook.com

- 8:30-8:42 S-7** High-throughput X-ray Powder Diffraction System Consisting of Multiple MYTHEN Detectors at Beamline BL02B2 of SPring-8
K. Sugimoto*, **S. Kawaguchi**, **M. Takemoto**, Japan Synchrotron Radiation Research Institute, Japan
- 8:43-8:55 S-22** Computed Tomography Experiments on a Laboratory Multipurpose Diffractometer
D. Beckers*, **N. Davivanyan**, **D.J. Götz**, **M. Fransen**, PANalytical, The Netherlands
- 8:56-9:08 S-51** Non-Invasive Identification of Pigments from XVI Century using an XRD/XRF System
V. Aguilar, **J.L. Ruvalcaba**, Universidad Nacional Autonoma de Mexico, Mexico
- 9:09-9:21 S-45** Renewed and Upgraded NIST SRMS for Powder Diffraction
J.P. Cline, **D.R. Black**, **M.H. Mendenhall**, **A. Henins**, NIST, USA
P.S. Whitfield, ORNL, USA
- 9:22-9:34 S-2** Current Status of the Liquid-Metal-Jet X-ray Source Technology
E. Espes, **J. Hållstedt**, **B. Hansson**, **U. Lundström**, **P. Takman**, **O. Hemberg**, **M. Otendal**, **T. Tuohimaa**, Excillum AB, Sweden
- 9:35-9:47 S-47** New User-Customized Calibrations for Handheld pXRF Analysers
C. Brand, Portable Analysers Australia, Australia
M. Cameron, Bruker Elemental, USA
- 9:48-10:00 S-34** Ultra High Speed Multi-element SDD X-ray Spectrometer with Improved Energy Response
Y. Wang, **S. Barkan**, **L. Feng**, **V. Saveliev**, **M. Zhang**, Hitachi High-Technologies Science America, Inc., USA
- 10:00 Break**
- 10:30-10:42 S-28** Advances in a Laboratory X-ray Analytical Microscope with micro X-ray Fluorescence Capabilities toward Significant Gains in Resolution and Sensitivity
W. Yun, **B. Stripe***, **S. Lewis**, **D. Reynolds**, **A. Lyon**, **J. Kirz**, Sigray, USA
- 10:43-10:55 S-31** The Soft X-ray Microgap (MICROMEAS) Gas Detector for WDXRF Spectrometers. Prototype Design and First Characterization Data
A. Stratilatov, **R. Creighton**, **J. Barron**, Moxtek, Inc., USA
- S-32** Study of Carbon Bonding with XES using a TES Microcalorimeter Detector
K. McIntosh*, **G. Havrilla**, **M. Jilesak**, **M. Rabin**, Los Alamos National Laboratory, USA
F. Vila, University of Washington
M. Carpenter, **R. Cantor**, Star Cryoelectronics, USA
- 10:56-11:08 S-60** Enhance the Quality of Your XRF Data by Using the Best Weighing Methods for Sample Preparation by Fusion
A.C. Breton*, Claisse, Canada
- 11:09-11:21 S-6** XRF Detector System with Hermetically Closed Silicon Drift Detector Modules for High Resolution Spectroscopy in Ambient Air Conditions
H. Schmidt, **H. Soltau**, **A. Niculae**, **A. Liebel**, **R. Lackner**, **D. Steigenhöfer**, **B. Talbi**, **M. Bornschlegl**, **T. Barros**, PNDetector GmbH, Germany
- 11:22-11:34 S-55** Phase Modification Descriptor in the Powder Diffraction File™
S. Kabekkodu*, International Centre for Diffraction Data (ICDD), USA
C. Crowder, Scientist-Emeritus, ICDD, USA
J. Dann, Consulting Editor, ICDD, USA
- 11:35-11:47 S-25** Energy Dispersive X-ray Diffraction to Answer the Question: "What's in the Box?"
S. Dorkings, Defence Science & Technology Laboratory - UK Ministry of Defence, UK
- S-41** Scanning Laue X-ray Neutron Diffraction for Structural Imaging and Its Applications for Material Science
C.S. Ku, **S.J. Chiu**, **C.Y. Chen**, National Synchrotron Radiation Research Center, Taiwan
- 11:48-12:00 S-61** High Performance Detectors for X-ray Spectroscopy
R. Redus*, **A. Huber**, **P. Kostamo**, **J. Kostamo**, Amptek Inc., Bedford, MA, USA

WITHDRAWN

Chair: **P. Pianetta**, Stanford University, USA, pianetta@slac.stanford.edu

Co-chair: **Y. Liu**, SLAC National Accelerator Laboratory, USA, liuyijin@SLAC.Stanford.edu

- 8:30** **S-26** Invited: Dreaming in Cool Colors: X-ray Microscopy to See What's There, and to Know What it is
C. Jacobsen, APS - Argonne National Laboratory, and Northwestern University, USA
- 9:00** **S-13** Realtime X-ray Fluorescence Movie of Calcium and Iron in Growing Chemical Garden
W. Zhao*, University of Tsukuba, Japan
K. Sakurai, National Institute for Materials Science, Japan
- 9:20** **S-50** X-ray Fluorescence Tomography Developments for Studies of Challenging Samples
O. Antipova*, **K. Kemner**, **S. Vogt**, **L.X. Li**, **D. Gursoy**, Argonne National Laboratory, USA
- 9:40** **S-30** Novel Microstructured X-ray Source Designed for Grating-Based Phase Contrast Imaging
W. Yun*, **S. Lewis**, **D. Reynolds**, **B. Stripe**, **A. Lyon**, **S. Chen**, **S. Seshadri**, **V. Semenov**, **J. Kirz**, Sigray, USA
- 10:00** **Break**
- 10:30** **S-54** Invited: Understanding Heterogeneities in Battery Materials through Multi-Modal X-ray Microscopy
W.E. Gent*, **Y. Li**, **J. Lim**, **W.C. Chueh**, Stanford University, USA
- 11:00** **S-24** Zinc (Zn) and Lead (Pb) Accumulation in the Tidemark of Articular Cartilage with High-resolution micro-XRF
M. Rauwolf*, **A. Turyanskaya**, **P. Wobrauschek**, **C. Strel**, Atominstitut - TU Wien, Austria
A. Roschger, Max Planck Institute of Colloids and Interfaces, Germany
I. Pape, **K. Sawhney**, Diamond Light Source Ltd, UK
P. Roschger, Hanusch Hospital, Austria
J.G. Hofstaetter, Orthopaedic Hospital Vienna-Speising, Austria
- 11:20** **S-39** Analyzing Challenging Materials with Micro-X-ray Fluorescence
C. Worley, Los Alamos National Laboratory, USA
- 11:40** **S-20** Multimodal Imaging of Biological Samples: Correlation of μ XRF with MALDI-MSI and with LA-ICP-MS
A. Turyanskaya*, **M. Rauwolf**, **L. Perneczky**, **P. Wobrauschek**, **C. Strel**, Atominstitut - TU Wien, Austria
A. Svirikova, **M. Bonta**, **A. Limbeck**, **M. Marchetti-Deschmann**, CTA - TU Wien, Austria
A. Roschger, **P. Roschger**, Hanusch Hospital, Austria

Mineral Exploration and Mining

Amphitheatre - Yellowstone Conf. Ctr.

Chair: **D.L. Bish**, Indiana University Bloomington, USA, bish@indiana.edu

- 8:30** **S-5** Invited: Handheld XRD Methods for Mining and Related Applications
G. Hansford, University of Leicester, UK
- 9:00** **S-10** Invited: Practical Applications of Portable XRF in Mineral Exploration: Confessions of a Geochemist
D. Arne, CSA Global, Canada
- 9:30** **S-3** Detecting the Undetectable: Lithium by Portable XRF
N. Brand, Portable XRF Services and University of Western Australia, Australia
C. Brand, Portable XRF Services, Australia
- 9:50** **F-17** Particle Size Effects in X-ray Fluorescence Analysis of Iron and Copper Minerals
B. Ganly*, **J. Tickner**, CSIRO, Australia
- 10:10** **Break**
- 10:40** **S-21** Invited: First Impressions Count: Applications of Field Portable X-ray Diffraction to Environmental Monitoring of Mine Sites
C.C. Turvey*, **S.A. Wilson**, **J.L. Hamilton**, Monash University, Australia
S.M. Jowitt, University of Nevada Las Vegas, USA
G. Southam, The University of Queensland, Australia
- 11:10** **F-46** Mg-carbonate Cements Trap Potentially Toxic Trace Metals and CO₂ at Woodsreef Mine, New South Wales
J.L. Hamilton*, **S.A. Wilson**, **B. Morgan**, **C.C. Turvey**, Monash University, Australia
D.J. Paterson, Australian Synchrotron, Australia
J. McCutcheon, **G. Southam**, The University of Queensland, Australia

- 11:30 F-78** Geochemical, Mineralogical, and Lithological Linkages in a Thick, Early Permian, Siliciclastic Succession, Midland Basin, West Texas, USA
A. Musgrove*, **A. Morrell**, **P. Mainali**, **H. Rowe**, **N. Ganser**, Premier Oilfield Laboratories, USA
- 11:50 S-33** Mineral Identification by Elemental Composition: A New Tool with PDF-4 Databases
T.G. Fawcett*, **J.R. Blanton**, **S.N. Kabekkodu**, **T.N. Blanton**, International Centre for Diffraction Data, USA

Polymers

Cheyenne - Yellowstone Conf. Ctr.

Chairs: **B. Landes**, Dow Chemical Company, USA, bglandes@dow.com
N.S. Murthy, Rutgers University, USA, murthy@biology.rutgers.edu

- 8:30 D-11** Invited: Novel Block Copolymer Morphologies Studied by GISAXS
K. Yager, Brookhaven National Laboratory, USA
- 9:00 D-29** Invited: SAXS Characterization of Nanocomposites and Polymer Matrix Composites
H. Koerner, Air Force Research Laboratory, USA
- 9:30 D-34** ICDD Full Diffraction Pattern Polymer Project – Applications in Pharmaceutical and Biomedical Materials
T. Blanton*, **S. Gates-Rector**, **T. Fawcett**, International Centre for Diffraction Data, USA
S. Misture, Alfred University, USA
- 9:50 D-40** Investigating Structures with Preferred Orientation Using X-ray and Neutron Scattering Techniques
Y. Mao, National Institute of Standards and Technology/University of Maryland, USA
- 10:10 Break**
- 10:40 D-82** Invited: X-ray Scattering at the Advanced Light Source
A. Hexemer, Lawrence Berkeley National Lab, USA
- 11:10 D-75** Morphological Changes in HMPE Fibers Induced from Transverse Pressures and its Application to the Study and Mapping of Ballistic Impacts on Unidirectional Laminates
S.T. Correale, Honeywell International, Inc., USA
- 11:30 D-43** An X-ray Pole Figure Analysis on BOPE Films with Sequential Biaxial Drawing
Y. Tang, **J. Yin**, **L. Liu**, SINOPEC, Beijing Research Institute of Chemical Industry, China
B.B. He, Bruker AXS, Inc., USA
- 11:50 D-53** Surface X-ray Scattering Study of Segregation of PEG in Polymers
W. Wang, **W.R. Lindemann**, **D. Vaknin**, Iowa State University, USA
N.S. Murthy*, Rutgers University, USA

General XRF and Environmental XRF

Lamar/Gibbon - Yellowstone Conf. Ctr.

Chairs: **J. Kawai**, Kyoto University, Japan, kawai.jun.3x@kyoto-u.ac.jp
R. Van Grieken, University of Antwerp, Belgium, rene.vangrieken@uantwerpen.be

- 8:30 F-11** Invited: Relation Between XANES Pre-edge and XRF $K\beta_5$ as the Changes of Chemical State, Local Symmetry, and Coordination Number
T. Yamamoto, Tokushima University, Japan
- 9:00 F-32** Invited: XRF Related Activities at the IAEA Nuclear Science and Instrumentation Laboratory
A. Migliori*, **R. Padilla-Alvarez**, **I. Darby**, International Atomic Energy Agency (IAEA) Laboratories, Austria
J. Osan, IAEA Laboratories, Austria and Hungarian Academy of Sciences, Hungary
- 9:30 F-34** Extracting Further Information from an X-ray Fluorescence Spectrum through Modeling of X-ray Scattering
L.P. O'Neil*, **D.C. Catling**, **W.T. Elam**, University of Washington, USA
- 9:50 F-42** Leveraging XRF to Simplify Metals Analysis in Pharmaceuticals
S. Wood*, **N. Lewen**, **M. Soumeillant**, **J. Qiu**, **J. Selekman**, **K. Zhu**, Bristol-Myers Squibb, USA
- 10:10 F-55** 3D-Polarized XRF Spectrometer with a 50kV and 4W X-ray Tube
T. Sugino, **R. Tanaka**, **J. Kawai**, Kyoto University, Kyoto, Japan
N. Shimura, RES Labo, Japan
- 10:30 Break**

- 11:00** **F-13** Invited: Atmospheric Aerosol Characterization and Source Apportionment: The Key Role of X-ray Based Techniques
P. Prati, University of Genoa, Italy
- 11:30** **F-1** The Advantages and Limitations of Handheld X-ray Fluorescence for Environmental Soil Screening
M. Kreiner, Oxford Instruments, USA
- 11:50** **F-40** Mercury Telluride XRF Calibration Standards
S.K. Zeisler*, **V. Jaggi**, **I. Kaur**, **H.K. Oberoi**, Micromatter Technologies Inc., Canada
- 12:10** **F-71** Wasted Streams: The Downstream Legacy of Mine Waste from Derelict Mines
D.B. Gore*, **K.A. Fryirs**, **T.J. Ralph**, Macquarie University, Australia

Oral Sessions, Thursday Afternoon, 3 August

**Signifies presenting author, when noted*

Imaging II

South Mammoth - Mountain Mall

Chair: **P. Pianetta**, Stanford University, USA, pianetta@slac.stanford.edu

Co-chair: **Y. Liu**, SLAC National Accelerator Laboratory, USA, liuyijin@slac.stanford.edu

- 1:30** **S-29** Invited: In-situ and Multi-modal X-ray Microscopy in Heterogeneous Catalysis
F. Meirer, Utrecht University, The Netherlands
- 2:00** **S-14** X-ray Fluorescence Imaging of Buried Interface
W. Zhao, University of Tsukuba, Japan
K. Sakurai, National Institute for Materials Science, Japan
- 2:20** **S-37** Sparse Macro-XRF Imaging of Large Works of Art
G. Pastorelli*, **E. Pouyet**, **Q. Dai**, **O. Cossairt**, **A. Katsaggelos**, **M. Walton**, Northwestern University, USA
- 2:40** **S-27** Wavelength-Dispersive XRF Imaging Using Soller Slits and 2D Detector
K. Tsuji*, **S. Aida**, **M. Yamanasghi**, Osaka City University, Japan
T. Sakumura, **K. Matsushita**, **T. Shoji**, **N. Kawahara**, Rigaku, Japan
- 3:00** **Break**
- 3:30** **S-40** Multi-Model X-ray Microtomography for In-Situ Structure Quantification and Analysis
T. Xiao*, **H. Xie**, **B. Deng**, **G. Du**, **R. Chen**, **G. Zhou**, **Y. Ren**, **Y. Wang**, **H. Tan**, **Y. Yang**, **L. Xu**, **T. Hu**, Shanghai Institute of Applied Physics, China
- 3:50** **S-42** Bragg Diffraction Transmission Microscopy Using Highly Monochromatic X-rays
S. Stoupin*, **A. Campello**, CHESS - Cornell University, USA
T. Kolodziej, **A. Said**, **Y. Shvyd'ko**, APS - Argonne National Laboratory, USA
- 4:10** **S-17** The Lyncean Compact Light Source: A Miniature Synchrotron for your Laboratory
M. Feser*, **R. Ruth**, **R. Loewen**, Lyncean Technologies, USA

Applied Materials I

North Mammoth - Mountain Mall

Chairs: **T.N. Blanton**, International Centre for Diffraction Data, USA, tblanton@icdd.com

T. Fawcett, Emeritus, International Centre for Diffraction Data, USA, dxcfawcett@outlook.com

- 1:30** **D-5** Invited: Crystal Structure Determination of Corrosion Products on Heritage Objects
S. Bette, **R.E. Dinnebier***, Max-Planck-Institute for Solid State Research, Germany
G. Eggert, **A. Fischer**, Academy of Art and Design, Germany
- 2:00** **D-69** Molecular Machinery Inside Crystalline Materials
V.N. Vukotic, University of Windsor and PROTO Manufacturing, Canada
- 2:20** **D-76** Flash Sintering of Hydroxyapatite and Titania Composite Structures for Biomedical Applications
A. Choksi, **T. Tsakalakos**, **H. Biçer**, Rutgers University, USA
J. Okasinski, APS - Argonne National Laboratory, USA
- 2:40** **D-62** Understanding the Mechanism of Flash Sintering with in situ EDXRD Experiments
S.K. Jha, **T. Tsakalakos***, Rutgers University, USA
- 3:00** **Break**
- D-37** Qualitative and Quantitative X-ray Fluorescence and XRD
A. Joseph*, **S. Al-Bahar**, **J. Chakkamalayath**, Kuwait Institute for Scientific Research, Kuwait
- 3:30** **D-10** Methodology and Determination of Water in Important Hydration Phases of Cements Afm (LDH)-Sulfate, Carbonate, Hydroxide Phases
H. Poellmann, University of Halle, Germany
- 3:50** **D-3** Influence of Amino Acids on the Crystallization of Calcium Silicates Hydrates
S. Witzleben, **A. Leiendecker**, **M. Wenzel**, Bonn-Rhein-Sieg University, Germany

WITHDRAWN

General XRD

Amphitheatre - Yellowstone Conf. Ctr.

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

- 1:30 D-22** High Throughput Combinatorial Studies of Thermoelectric Materials
W. Wong-Ng*, **J. Martin**, **M. Otani**, **S. Barron**, **N. Nguyen**, **E.L. Thomas**, **K.R. Talley**, NIST, USA
Y. Yan, Wuhan University of Technology, China
- 1:50 D-48** The Lattice Spacing Variability of Intrinsic Float-Zone Silicon
C.I. Szabo*, **E.G. Kessler**, **J.P. Cline**, **A. Henins**, **L.T. Hudson**, **M.H. Mendenhall**, **M.D. Vaudin**, NIST, USA
- 2:10 D-80** Electrical Properties and Crystallization Study of Indium Oxide Thin Films Via Grazing-Incidence Wide-Angle X-ray Scattering
G.B. Gonzalez*, **J. Boesso**, DePaul University, USA
J.S. Okasinski, **J.D. Almer**, Argonne National Laboratory, USA
D.B. Buchholz, **L. Zeng**, **M.J. Bedzyk**, **R.P.H. Chang**, Northwestern University, USA
- D-78** Characterization of XANES Spectra for Olivine Minerals as a Function of Orientation and Composition
N. Valdez, **M. Gunter**, University of Illinois at Chicago, USA
M.D. Dyar, Mount Holyoke College, USA
- 2:30 D-89** Advancing Clinical Diagnosis of Bone Diseases using X-ray Diffraction
C. Greenwood*, **K. Rogers**, Cranfield University, UK
R. Scott, Gloucestershire Royal Hospital, UK
M. Wilson, Science and Technology Facilities Council, UK
- 2:50 D-91** Alloying Large Organic Cations into the Perovskite Framework for Enhanced Thermal Stability and Transport Properties
W. Peng, **X. Miao***, **O.M. Bakr**, King Abdullah University of Science and Technology (KAUST), Saudi Arabi
- 3:10 Break**
- 3:40 D-63** A Polycapillary Based Method of Monochromatic Time-Resolved X-ray Reflectivity
H. Joress*, **J.D. Brock**, **A.R. Woll**, CHESS - Cornell University, USA
- 4:00 D-79** Energy Dispersive Diffraction Imaging Using a New Germanium Strip Detector
J.S. Okasinski*, **J.D. Almer**, **J. Baldwin**, **R. Woods**, **A. Miceli**, **O. Quaranta**, APS - Argonne National Laboratory, USA
S.R. Stock, Northwestern University, USA
D.P. Siddons, NSLS-II - Brookhaven National Laboratory, USA
- 4:20 D-27** Synchrotron *tts* Microdiffraction: from Data Acquisition to Structure Solution
J. Rius*, CSIC-Institut de Ciència de Materials de Barcelona, Spain
O. Vallcorba, ALBA Synchrotron Light Source, Spain
- 4:40 D-41** X-ray Crystallography with the EIGER R 4M Large-area HPC Detector
M. Mueller*, **A. Förster**, **C. Schulze-Briese**, DECTRIS Ltd., Switzerland
- 5:00 D-44** Deconvolution-convolution Method
T. Ida, **D. Hattan**, Nagoya Institute of Technology, Japan
K. Nomura, Advanced Industrial Science and Technology, Japan

WITHDRAWN

Trace Analysis including TXRF

Cheyenne - Yellowstone Conf. Ctr.

Chair: **A. Pejovic-Milic**, Ryerson University, Canada, anamilic@ryerson.ca

- 1:30 F-14** Invited: How to Establish a New Technique as a Standard: The Case of Total Reflection X-ray Fluorescence
L. Borgese*, **L. Depero**, University of Brescia, Italy
- 2:00 F-19** Invited: X-ray Fluorescence Measurement of Bone Pb In Vivo: A Review and Prospects for Improvement
D. Chettle, McMaster University, Canada
- 2:30 F-24** Detection of Localized Tungsten Deposition and Speciation in Bone using μ XRF and μ XANES
C.R. VanderSchee*, **D. Kuter**, **D.S. Bohle**, McGill University, Canada
- 2:50 F-25** A Movement Towards the use of Portable X-ray Analyzers for the in vivo Measurements of Lead and Strontium in Bone
E. Da Silva, **A. Pejovic-Milic**, Ryerson University, Canada

- 3:10** **F-26** Total Reflection X-ray Fluorescence Based Method Development for Quantification of Gold Nanoparticles in Breast Cancer Cells
G. Mankovskii*, **C. Yang**, **A. Pejovic-Milic**, Ryerson University, Canada
D. Chithrani, University of Victoria, Canada
- 3:30** **Break**
- 4:00** **F-6** Confocal X-ray Fluorescence Microscopy Study on Plant Roots using Synchrotron Source
Z. Finfrock, Canadian Light Source Inc., Canada
S. Macfie, Western University, Canada
- 4:20** **F-48** Perspectives and Opportunities in Plant and Food Science Research of Synchrotron Microscopy and Spectroscopy Techniques
D. Eichert, Elettra - Sincrotrone Trieste, Italy
- 4:40** **F-41** Determination of Heavy Metals in Fruit Juices and Juice Blends by Total Reflection X-ray Fluorescence
M. Schmeling*, **J. Arroyo**, **K. Niaz**, **P. Sreerama**, **G. Sukhera**, Loyola University Chicago, USA
- 5:00** **F-59** Trace Element Analysis of Airborne Particulate Matter with TXRF and SR-TXRF-XANES
J. Prost*, **A. Zinkl**, **D. Ingerle**, **J.H. Sterba**, **P. Wobrauschek**, **C. Strelj**, Atominstitut - TU Wien, Austria
D.M. Eichert, **W.H. Jark**, Elettra – Sincrotrone Trieste, Italy
G. Pepponi, Fondazione Bruno Kessler, Italy
A. Migliori, **A.G. Karydas**, **M. Czyzycki**, International Atomic Energy Agency, Austria
A. Guilherme Buzanich, **U. Reinholz**, **H. Riesemeier**, **M. Radtke**, Federal Institute for Materials Research and Testing, Germany
- 5:20** **F-73** Mercury Emissions Monitoring by TXRF
M. Garcia, **N. Kumar**, nanoRANCH-UHV Technologies, Inc., USA

Oral Sessions, Friday Morning, 4 August

**Signifies presenting author, when noted*

Energy Storage Materials

Cheyenne - Yellowstone Conf. Ctr.

Chair: **M.A. Rodriguez**, Sandia National Laboratory, USA, marodri@sandia.gov

- 8:30** **S-49** Invited: In-situ and Ex-situ Characterization of Lithium Ion Batteries using X-ray and Neutron Diffraction Methods
A. Payzant, Oak Ridge National Laboratory, USA
- 9:00** **S-44** Short-range Distortions and Long-range Cubic Order in Barium Titanate Nanoparticles
T. Monson, Sandia National Labs, USA
R. Haskell, S.H. Bang, Harvey Mudd College, USA
C. Shi, S. Billinge, Columbia University, USA
- S-19** Crystal Structure in Bringing Excellent Electrochemical Properties in Alluaudite Type Sodium Insertion Materials
D. Dwibedi*, **P. Barpanda**, Indian Institute of Science, India
- 9:20** **Break**
- 9:40** **S-58** Invited: Characterization of Energy Storage Materials with Energy-Dispersive X-ray Diffraction: Challenges and Insights
W.A. Paxton, Ford Motor Company, USA
- 10:10** **S-36** Development of a Novel sub eV, High Throughput, High Spatial Resolution, Laboratory X-ray Absorption Spectrometer for XANES and EXAFS Measurements
S. Seshadri, W. Yun. B. Stripe, D. Reynolds, A. Lyon, S. Lewis, J. Kirz, Sigray, Inc., USA

WITHDRAWN

Applied Materials II

North Mammoth - Mountain Mall

Chairs: **T.N. Blanton**, International Centre for Diffraction Data, USA, tblanton@icdd.com

T. Fawcett, Emeritus, International Centre for Diffraction Data, USA, dxcfawcett@outlook.com

- 8:30** **D-83** Invited: Characterization of Aluminum Alloys for Cylinder Heads
T.R. Watkins*, **M. Frost, K. An, L.F. Allard, D. Shin, A. Sabau, A. Shyam, J.A. Haynes**, Oak Ridge National Laboratory, USA
S. Roy, Oak Ridge National Laboratory, USA and Indian Institute of Technology, India
S. Mirmiran, Y. Liu, Fiat Chrysler Automobiles North America, LLC., USA
A.F. Rodriguez, A. Gonzalez, Nemak Monterrey, Mexico
- 9:00** **D-12** In-situ XRD studies of Microstructural Changes in Steel
M. Witte, Salzgitter Mannesmann Forschung GmbH, Germany
I. Janssen, Georg-August University Göttingen, Germany
- 9:20** **D-66** In-situ EDXRD Study of Flash Sintering of Tin Oxide
H. Charalambous, S. Jha, T. Tsakalacos, M. Wassel*, Rutgers University, USA
- 9:40** **Break**
- 10:00** **D-74** Flash Sintering of Ultrahigh Melting Temperature Covalent Nonoxide Ceramics at Low Temperatures with Low DC Electric Fields "An in situ EDXRD Study with a 200 keV Synchrotron Probe"
T. Tsakalacos, Rutgers University, USA
- 10:20** **D-45** Understanding Processing Induced Defects and Decomposition in PuO₂, PuF₄ and Uranium Alloys
L. Sweet*, **M. McCoy, J. Corbey, A. Casella, S. Jana, V. Joshi, S. Sinkov, C. Delegard, J. Tingey, G. Lumetta, D. Meier, C. Lavender, K. Pitts**, Pacific Northwest National Laboratory, USA
- 10:40** **D-60** Flash Sintering of Bismuth Ferrite in situ with EDXRD
M. Wassel*, **S. Jha, T. Tsakalacos**, Rutgers University, USA
E. Gil-Gonzalez, L.A. Pérez-Maqueda, Instituto de Ciencia de Materiales de Sevilla, Spain

Pair Distribution Function

Amphitheatre - Yellowstone Conf. Ctr.

Chair: **M.G. Tucker**, Oak Ridge National Laboratory, USA, tuckermg@ornl.gov

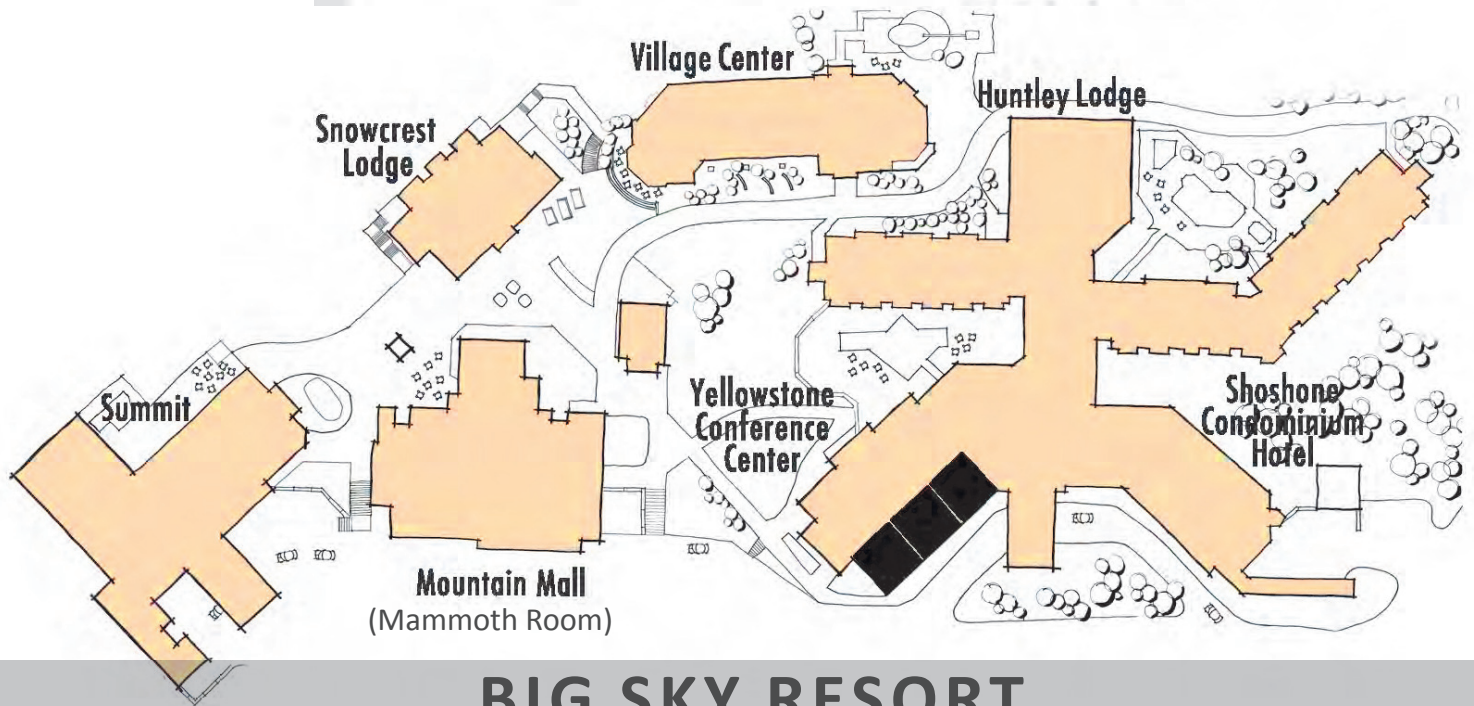
- 8:30** **D-23** Invited: New Developments in PDF Software: Automatic Processing and Complex Modelling
P. Chater*, **D. Keeble**, **M. Wharmby**, **T. Spain**, **J. Filik**, **H. Wilhelm**, Diamond Light Source, UK
- 9:00** **D-55** X-ray PDF to Quantify Defects in Disordered 2-D MnO₂ Nanosheet Assemblies
P. Metz, **S. Misture**, Alfred University, USA
- 9:20** **D-54** X-ray Absorption Spectroscopy with Other Simulation Techniques to Work on Amorphous and Nano-systems
Y. Zhang*, Oak Ridge National Laboratory, USA and Queen Mary, University of London, UK
A. Karatutlu, **O. Ersoy**, **A. Sapelkin**, Queen Mary, University of London, UK
- 9:40** **Break**
- 10:00** **D-28** Invited: Multi-technique Structural Refinements Using the RMC Method
I. Levin, National Institute of Standards & Technology, USA
- 10:30** **D-59** Local Structural Distortions in the Boron Sublattice of Mixed Alkaline Earth Hexaborides Evidenced through Reverse Monte Carlo Modeling of X-ray Pair Distribution Functions
R.J. Koch*, **P.C. Metz**, **S.T. Misture**, Alfred University, USA
J. Cahill, **O. Jaime**, **O. Graeve**, University of California, USA
V.R. Vasquez, University of Nevada, Reno, USA
- 10:50** **D-24** Application of Pair Distribution Function Analysis on Laboratory Diffractometer in the Temperature Range 80 – 1400 K
O. Narygina*, **M. Sommariva**, **C.A. Reiss**, **M. Gateshki**, **M.J. Fransen**, PANalytical B.V., The Netherlands
J. Quinn, PANalytical, Inc., USA
A. Pein, Anton Paar GmbH, Austria

Industrial Applications of XRF

South Mammoth - Mountain Mall

Chair: **D. Broton**, CTLGroup, USA, dbroton@ctlgroup.com

- 8:30** **F-8** Applications of EDXRF Throughout the Food Industry
M. Kreiner, Oxford Instruments, USA
- 8:50** **F-74** Online Real Time Metal Analysis during Pharmaceutical Manufacturing
M. Garcia, **N. Kumar**, nanoRANCH-UHV Technologies, Inc, USA
- 9:10** **F-39** Industrial and Forensic Application of micro-XRF: Glass Analysis
S. Mamedov, Horiba Scientific, USA
- 9:30** **F-63** Quality Control of Nanolayered Materials by XRR and GIXRF
D. Eichert, **W. Jark**, Elettra - Sincrotrone Trieste, Italy
- 9:50** **Break**
- 10:10** **F-10** Surface Finish Thickness Determination on Printed Circuit Boards Sub-structures using Conventional XRF
F. Bogani, Intel Corporation, USA
- 10:30** **F-9** Microstructure Analysis of Cement-Based Materials using micro X-ray Fluorescence
A.B. Giorla, **E. Tajuelo-Rodriguez**, **S. Curlin**, **Y. Le Pape**, **T.M. Rosseel**, Oak Ridge National Laboratory, USA
A. Abd-Ellsamd, University of Tennessee, USA
- 10:50** **F-60** A Chemostratigraphy-driven Workflow for the Analysis/Interpretation of Unconventional Core
H. Rowe, **A. Morrell**, **P. Mainali**, **S. Narasimhan**, **N. Ganser**, Premier Oilfield Laboratories, USA
- 11:10** **F-43** Applications of Low Power Monochromatic WDXRF for Sulfur and Chlorine Analysis in Petroleum Industry - Overview and Recent Developments
Z.W. Chen, **L. Johnson**, XOS, USA



BIG SKY RESORT

2017 Denver X-ray Conference ♦ Program-at-a-Glance ♦ Monday – Friday ♦ 31 July – 4 August

Monday Morning Workshops 9:00 am – 12:00 Noon				
	Meeting Rooms			
	North Mammoth – Mountain Mall	South Mammoth – Mountain Mall	Amphitheatre – Yellowstone Conf. Ctr.	Lamar/Gibbon or Cheyenne – Yellowstone Conf. Ctr.
Special Topic	Getting Started at User Facilities (Lapidus)			
XRD			Specimen Preparation of XRD (Fawcett)	
XRF		Basic XRF (Drews)		Trace Analysis including TXRF (Wobrauschek/Streli) <i>Cheyenne</i>
Monday Afternoon Workshops 1:30 pm – 4:30 pm				
XRD	Stress (Noyan/Murray)		Polymers (Landes/Murthy)	
XRF		Energy Dispersive (Lemberge)		Micro XRF (Witherspoon) <i>Cheyenne</i>
Monday Evening XRD Poster Session & Reception 5:00 pm – 7:00 pm. Huntley Dining Room – Yellowstone Conf. Ctr. (Watkins/Rodriguez)				
Tuesday Morning Workshops 9:00 am – 12:00 Noon				
XRD			Rietveld Refinement using In Situ Powder Diffraction Data I (Yakovenko/Kaduk)	
XRF	Handheld XRF – The Silver Bullet or Fool’s Gold (Loubser)	Challenges in XRF Analysis (Kawai)		Quantitative Analysis I (Elam) <i>Lamar/Gibbon</i>
Tuesday Afternoon Workshops 1:30 pm – 4:30 pm				
XRD	Strain & Phase Mapping of Industrial Materials... (Tsakalakos)		Rietveld Refinement using In Situ Powder Diffraction Data II (Yakovenko/Kaduk)	
XRF		Sample Preparation of XRF (Anzelmo)		Quantitative Analysis II (Elam) <i>Lamar/Gibbon</i>
Tuesday Evening XRF Poster Session & Reception 5:00 pm – 7:00 pm. Huntley Dining Room – Yellowstone Conf. Ctr. (Loubser/Schmeling)				
Wednesday Morning Plenary Session 8:30 am – 11:45am Inspecting the Infrastructure – Safeguarding with X-rays (Murray/Broton) Talus Room – Summit Hotel				
Wednesday Afternoon Sessions				
Special Topic	New Developments in XRD & XRF Instrumentation I (Blanton/Fawcett)			
XRD			Stress and Infrastructure (Watkins)	Rietveld (Huq) <i>Lamar/Gibbon</i>
XRF		Quantitative Analysis of XRF (Brehm)		
Wednesday Evening Vendor Sponsored Reception 5:30 pm - 7:00 pm. Exhibit Hall/Yellowstone Conference Center				
Thursday Morning Sessions				
Special Topic	New Developments in XRD & XRF Instrumentation II (Blanton/Fawcett)	Imaging I (Pianetta/Liu)	Mineral Exploration and Mining (Bish)	
XRD				Polymers (Landes/Murthy) <i>Cheyenne</i>
XRF				General XRF & Environmental XRF (Kawai/Van Grieken) <i>Lamar/Gibbon</i>
Thursday Afternoon Sessions				
Special Topic		Imaging II (Pianetta/Liu)		
XRD	Applied Materials I (Fawcett/Blanton)		General XRD (Murray)	
XRF				Trace Analysis including TXRF (Pejovic-Milic) <i>Cheyenne</i>
Friday Morning Sessions				
Special Topic				Energy Storage Materials (Rodriguez) <i>Cheyenne</i>
XRD	Applied Materials II (Fawcett/Blanton)		Pair Distribution Function (Tucker)	
XRF		Industrial Applications of XRF (Broton)		