Monday, August 4, 2014

PLENARY LECTURES AND AWARDS

Jeanette M. Killius, MSA President
Tom Kelly, MAS President
Richard A. Blackwell, IMS President
Anja Geitmann, MSC\SMC President
Se Ahn Song, IUMAS President
David Bell, Program Chair

Monday 8:30 AM • Convention Center Ballroom AB

8:30 AM  Opening Welcome: Jeanette M. Killius, MSA President, Tom Kelly, MAS President, Richard A. Blackwell, IMS President, Anja Geitmann, MSC\SMC President, Se Ahn Song, IUMAS President and David Bell, Program Chair

8:45 AM  M&M Plenary Lecture - “How Cutting-Edge Atomic Resolution Microscopy Can Help to Solve Some of the World’s Energy Problems” by Colin Humphreys; University of Cambridge, United Kingdom

9:30 AM  MAS Awards Presentation
9:40 AM  IMS Awards Presentation
9:50 AM  MSC\SMC Awards Presentation
10:00 AM  Coffee Break
10:30 AM  MSA Awards Presentation
10:45 AM  IUMAS Awards Presentation
11:00 AM  M&M Meeting Awards Presentation
11:15 AM  M&M Plenary Lecture - “Living Images from the Birth of Microscopy” by Brian J. Ford; Cambridge, United Kingdom

BIOLOGICAL SCIENCES TUTORIAL
MONDAY AFTERNOON

X52Super Resolution: What Technique Should I Use?

Session Chair: Scott Stagg, Florida State University

Platform Session
Monday 1:30 PM • Room: 13

1:30 PM  1072 Practical Considerations for Single Molecule Localization Microscopy Sample Preparation; JR Allen, MW Davidson; Florida State University

IMS Henry Clifton Sorby Award and Lecture
MONDAY AFTERNOON

X99 Sorby Award

Session Chair: Richard A. Blackwell, IMS President

Platform Session
Monday 1:30 PM • Marriott Ballroom A

1:30 PM  1081 (Invited) Metallographic and Fractographic Contributions to Understanding Environmentally Assisted Cracking; S Lynch; Defence Science and Technology Organisation, Australia
Scientific Program

ADVANCES IN INSTRUMENTATION SYMPOSIA
MONDAY AFTERNOON

A01.01 Oliver Wells Memorial Symposium on the Scanning Electron Microscope

Session Chairs:
Lynne M. Gignac, IBM T. J. Watson Research Center; David C. Joy, University of Tennessee; Brendan J. Griffin, University of Western Australia

Platform Session
Monday 1:30 PM • Room: 24

1:30 PM 1 (Invited) Oliver Wells (1931-2013) A Brief Memorial; DC Joy; University of Tennessee; L Gignac; IBM T J Watson Research Center

1:45 PM 2 (Invited) Oliver C. Wells’ Vision: Use of Low-Loss Electrons to Enhance and Measure the Surface Detail in the Scanning Electron Microscope at High Resolution; M Postek, A Vladar, B Ming; National Institute of Standards and Technology

2:15 PM 3 IUMAS-6 Early Career Scholar ee Model-Based Library for Critical Dimension Metrology by CD-SEM; Y Zou, P Zhang, S Mao, Z Ding; University of Science and Technology of China

2:30 PM 4 (Invited) High Energy BSE/SE/STEM Imaging of 8 um Thick Semiconductor Interconnects; LM Gignac, CM Bre-slin, J Gonsalves, F Stellari, C-C Lin; IBM T. J. Watson Research Center

A04.01 Electron Holography at the Atomic Scale and the Nanoscale

Session Chairs:
M.R. McCartney, Arizona State University; N. Osakabe, Hitachi High Technologies America, Ltd.

Platform Session
Monday 1:30 PM • Marriott Ballroom B

1:30 PM 122 (Invited) Electron Holography in Solids: Problems and Progress; H Lichte, F Boerrnert, B Einenkel, A Lenk, A Lubk, F Roeder, J Stickmann, S Sturm, K Vogel, D Wolf; Technische Universitaet Dresden, Germany

2:00 PM 123 (Invited) Collective Motion of Secondary Electrons Visualized by Electron Holography; D Shindo, Z Akase; Tohoku University, Japan; HS Park; RIKEN, Japan

2:30 PM 124 Accumulated Reconstruction Method for Electron Holography; K Harada, H Kasai; Hitachi High Technologies America, Ltd.

2:45 PM 125 Magnetic Imaging with a Novel Hole-Free Phase Plate; S Pollard, Y Zhu; Brookhaven National Laboratory; M Malac; National Institute of Nanotechnology, Canada; M Beleggia; Technical University of Denmark; M Kawasaki; JEOL, Inc., Japan

A07.01 Microscopy and Spectroscopy for Power Generation and Energy Storage

Session Chairs:
Torsten Schwarz, Max-Planck-Institut für Eisenforschung GmbH, Germany; Eva Olsson Chalmers University

Platform Session
Monday 1:30 • PM Room: 15

1:30 PM 197 (Invited) Nano-scale Characterization of Thin-Film Solar Cells; T Schwarz, O Cojocaru-Mirédin, P-P Choi, D Raabe; Max-Planck-Institut für Eisenforschung GmbH, Germany; A Lämmle, R Würz; Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden Württemberg, Germany; M Mousel, A Redinger, S Siebentritt; University of Luxembourg; S Botti; Université Claude Bernard Lyon 1, France

2:00 PM 198 STEM-EELS Studies of Coordination at Al₂O₃/Si interfaces in Si Solar Cells; W Zhang, P Looney, F Wang; Brookhaven National Laboratory; K Davis, W Schoenfeld; University of Central Florida

2:15 PM 199 Electron Microscopy of Organic Solar Cells Thermally Stabilized with Fullerene Nucleating Agents; S Gustafsson, O Bäcke, S Nik, A Sanz-Velasco, C Lindqvist, E Wang, MR Andersson, C Müller, E Olsson; Chalmers University of Technology, Sweden

2:30 PM 200 Monochromated Electron Energy-Loss Spectroscopy Spectrum Imaging of Organic Photovoltaic Devices; FJ Scheltens, JA Alexander, DW McComb; The Ohio State University; MF Durstock, CE Tabor, BJ Leever, LF Drummy; Materials and Manufacturing Directorate; MD Clark, DP Butcher; UES, Inc.
Scientific Program

2:45 PM  **201** Measurement of atomic fractions in Cu(In,Ga)Se2 films by Auger Electron Spectroscopy (AES) and Energy Dispersive Electron Probe Microanalysis (ED-EPMA); V-D Hodoroaba, T Wirth, WES Unger; BAM Federal Institute for Materials Research and Testing, Germany; R Terborg; Bruker Nano; KJ Kim; Korea Research Institute of Standards and Science, South Korea

2:45 PM  **480** Investigation of Possible Nucleation Mechanisms for Producing an Ultra-Refined Alpha Phase Microstructure in Beta Titanium Alloys Using High-Resolution Electron Microscopy and 3D Atom Probe Tomography; Y Zheng, REA Williams; The Ohio State University; S Nag, R Banerjee; University of North Texas

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**A16.01 Correlative Microscopy and Microanalysis from Macro to Pico**

Session Chairs:
Brian P. Gorman, Colorado School of Mines; Christopher J. Gilpin, Purdue University; Mor Baram, McMaster University, Canada

Platform Session
Monday 1:30 PM • Room: 21

1:30 PM  **476** (Invited) Characterization of Photovoltaics: From Cells Properties to Atoms; H Guthrey, S Johnston, M Al-Jassim; National Renewable Energy Laboratory; B Gorman; Colorado School of Mines

2:00 PM  **477** Understanding the High-Temperature Mechanical Properties of A710 (HSLA-80) Steel With Use of Complementary Atom Probe Tomography and Electron Microscopy; AN Chiaramonti, JW Sowards, JR Fekete; National Institute of Standards and Technology; DK Schreiber; Pacific Northwest National Laboratory

2:15 PM  **478** 3D Microstructure Characterization and Analysis of Al-Si Foundry Alloys at Different Length Scales; M Engstler, J Barriero, F Mücklich; Saarland University, Germany; N Ghafoor, M Odén; Linköping University, Sweden

2:30 PM  **479** Probing the Crystallography of Ordered Phases by Coupling Orientation Microscopy and Atom Probe Tomography; S Meher, P Nandwana, T Rojhirunsakool, R Banerjee; University of North Texas

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**A17.01 Extended Crystal Defects: Quantification of Strain, Local Atomic Structure and Chemistry**

Session Chairs:
Douglas L. Medlin, Sandia National Laboratories; Jim Ciston, Lawrence Berkeley National Laboratory; Yoosuf N. Picard, Carnegie Mellon University

Platform Session
Monday 1:30 PM • Room: 12

1:30 PM  **510** (Invited) Imaging Extended Defects by TEM; CB Carter; University of Connecticut

2:00 PM  **511** (Invited) Towards a Uniform Model for Lattice Defect Image Simulations; M De Graef; Carnegie Mellon University

2:30 PM  **512** (Invited) Electron Channeling Contrast Imaging of Defects in III-Nitride Semiconductors; C Trager-Cowan, G Naresh-Kumar, N Allehiani, S Kraeusel, B Hourahine, S Vespucci, D Thomson, J Bruckbauer, G Kusel, PR Edwards, RW Martin; University of Strathclyde; C Mauder; Aixtron; AP Day; Aunt Daisy Scientific Ltd. United Kingdom; A Kappers, RA Oliver, CJ Humphreys; University of Cambridge. United Kingdom; MA Moram; Imperial College London. United Kingdom; P Shields, ED Le Boulbar; University of Bath. United Kingdom; D Manetski, V O’Shea; University of Glasgow. United Kingdom; KP Mingard; National Physical Laboratory National Physical Laboratory
A18.01 Vendor Symposium: New Tools for Life and Materials Sciences

Session Chairs:
Alice C. Dohnalkova, Pacific Northwest National Laboratory;
Elizabeth R., Wright Emory University;
Mark A. Sanders, University of Minnesota

Platform Session
Monday 1:30 PM • Room: 25

1:30 PM 545 Applications and Design of Reinforced Silicon Nitride Windows for In-Situ Liquid Transmission Electron Microscopy; MJ Dukes, R Thomas, J Damiano; Protochips, Inc.; AD Dukes III; Lander University; KL Klein; University of the District of Columbia; DF Kelly; Virginia Tech Carilion Research Institute

1:45 PM 546 TAG Lens: Revolutionizing Optical Microscopy With Ultra-High Speed Variable Focus; C Theriault, J Guttenfelder, CB Arnold; TAG Optics Inc.

2:00 PM 547 A Novel Compact Stand-alone FTIR Microscope for the Analysis of Small Samples; TJ Tague, Jr.; Bruker Corporation

2:15 PM 548 Rapid, High-Resolution Raman Imaging of Pharmaceutical, Biological, and Other Materials with the Thermo Scientific DXRxri; A. Rzhevskii, RA Heintz, MJ Wall, JL Ramirez; Thermo Fisher Scientific

2:30 PM 549 (Invited) The Unique Capabilities of Auger Electron Spectroscopy; R Price; Physical Electronics

2:45 PM 550 Secondary Electron Imaging in the Helium Ion Microscope; B Matola; Denison University; DC Joy; University of Tennessee

BIOLOGICAL SCIENCES SYMPOSIA
MONDAY AFTERNOON

B02.01 Microbes and Microbial Communities

Session Chairs:
Elizabeth R. Wright, Emory University;
Teresa Ruiz, University of Vermont;
Gary Dunny, University of Minnesota

Platform Session
Monday 1:30 PM • Room: 17

1:30 PM 588 (Invited) Quantitative Single-Cell Gene Expression Measurements in Bacteria Using Time-Lapse Microscopy; MJ Dunlop; University of Vermont

2:00 PM 589 IUMAS-6 Early Career Scholar Probing Magnetic Polarities of Magnetotactic Bacteria by X-ray Magnetic Circular Dichroism in a Scanning Transmission X-ray Microscope; X Zhu, A Hitchcock; McMaster University, Canada; T Tyliszczak; Advanced Light Source; D Bazylnski; University of Nevada Las Vegas

2:15 PM 590 Chemical Imaging of Biofilms: The Integration of Synchrotron Imaging, Electron Microscopy and Nuclear Magnetic Resonance (NMR) Technologies; MJ Marshall, SM Belchuk, AE Tucker, M Thomas, RS Renslow, AP Kuprat, AC Dohnalkova; Pacific Northwest National Laboratory; CJ Hirschmugi; University of Wisconsin-Milwaukee

2:45 PM 591 (Invited) Three Dimensional Visualization of Bacterial Type III Export Apparatus in the Lyme Disease Spirochete Borrelia Burgdorferi; J Tu, J Liu; University of Texas, Houston

B06.01 Microanalysis of Biological Materials

Session Chairs:
Peta L. Clode, University of Western Australia;
Richard D. Leapman, National Institutes of Health

Platform Session
Monday 1:30 PM • Room: 23

1:30 PM 650 (Invited) Compositional Imaging of Cells and Bionanoparticles by EFTEM; MA Aronova, RD Leapman; National Institutes of Health
Scientific Program

**Monday August 4**

2:00 PM  **651** (Invited) *Quantifying Nanoparticle-Cell Interactions*; N Hondow, A Brown, R Brydson; University of Leeds, United Kingdom; HD Summers, MR Brown, P Rees, MD Holton; Swansea University, United Kingdom

2:30 PM  **652** *High Speed EELS and EFTEM Analysis Across the Visual Cortex*; P Longo, RD Twesten; Gatan Inc.

2:45 PM  **653** *Revealing the Secrets of Strong Iron Enrichment in Hard Dental Tissues from Feral Coypu (Myocastor coypus) by Analytical (S)TEM*; V Srot, U Salzberger, B Bussmann, PA van Aken; Max Planck Institute for Intelligent Systems, Germany; B Pokorny, J Jelenko; Erico Velenje inštitut za ekološke raziskave d.o.o, Slovenia

**B08.01 Optical, Confocal and Fluorescence Imaging**

Session Chair:
Judith Lacoste, MIA Cellavie, Inc., Canada

**Platform Session**
Monday 1:30 PM • Room: 27

1:30 PM  **676** *Compact Orientation-Independent Differential Interference Contrast (OF-DIC) Microscope Designed for High Resolution and High Sensitivity Mapping of Optical Path and Optical Path Gradient*; M Shribak; Marine Biological Laboratory

1:45 PM  **677** *Intravital Microfluidic Windows for Delivery of Chemicals, Drugs and Probes*; PK Myneni, G Wright, C Janetopoulos; Vanderbilt University; A Terekhov, W Hofmeister; University of Tennessee Space Institute

2:00 PM  **678** (Invited) *Engineered Fluorescent Proteins Bring Biochemistry To Light*; RE Campbell; University of Alberta

2:30 PM  **679** (Invited) *Development of Fluorogenic Antioxidants to Monitor Reactive Oxygen Species in the Lipid Membrane of Live Cells*; K Krumova, LE Greene, R Godin, R Lincoln, G Cosa; McGill University

**PHYSICAL SCIENCES SYMPOSIA**

**MONDAY AFTERNOON**

**P02.01 Advances in In situ Microscopy**

Session Chairs:
David A. Muller, Cornell University; Haimei Zheng, Lawrence Berkeley National Laboratory; Adam P. Hitchcock, McMaster University, Canada; Thomas LaGrange, Lawrence Livermore National Laboratory

**Platform Session**
Monday 1:30 PM • Marriott Ballroom C

1:30 PM  **752** (Invited) *Nanoscale Dynamics in Ultrathin Liquids Visualized with TEM*; J Lu, Z Aabdin, U Mirsaidov; National University of Singapore

2:00 PM  **753** *In situ Liquid Cell Electron Microscopy of the Solution Growth of Core-Shell Nanostructures*; E Sutter, K Jungjohann, S Bliznakov, E Stach, S Wong, C Lewis, P Sutter; Brookhaven National Laboratory; A Courty; Universite Pierre et Marie Curie, France

2:15 PM  **754** *Tuning Electrodeposition Parameters for Tailored Nanoparticle Size, Shape, and Morphology: An In situ ec-STEM Investigation*; RR Unocic, R Sacci, G Veith, N Dudney, K More; Oak Ridge National Laboratory

2:30 PM  **755** *Imaging Shape-Dependent Corrosion Behavior of Pt Nanoparticles over Extended Time Using a Liquid Flow Cell and TEM*; J Wu, W Gao, H Yang, J-M Zuo; University of Illinois, Urbana-Champaign

2:45 PM  **756** *Correlative Fluorescence and Liquid Cell STEM of Live Magnetotactic Bacteria*; TJ Woehl, S Kashap, T Prozorov; Ames Laboratory; M Sanchez-Quesada, C Jimenez Lopez; University of Granada; T Perez-Gonzalez, D Faire; Max Plank Institute for Colloids and Interfaces, Germany; D Trubysyn, D Bazylinski; University of Nevada, Las Vegas
P03.01 Mineral Analyses from Laboratory to Spacecraft

Session Chairs:
Rhonda M. Stroud, U.S. Naval Research Laboratory; Zack Gainsforth, University of California at Berkeley

Platform Session
Monday 1:30 PM • Room: 11

1:30 PM 834 (Invited) Remote-Sensing of Planetary Surface Using Infrared Spectroscopy: J Helbert; DLR Institute for Planetary Research, Germany

2:00 PM 835 M&M Student Awardee Nanoscale Infrared Spectroscopy: A non-Destructive Probe of Formation History in Extraterrestrial Samples; AS McLeod, P Kelley, M Thiemens, DN Basov; University of California, San Diego; G Dominguez; California State University, San Marcos; Z Gainsforth; University of California, Berkeley; F Keilmann; Ludwigs-Maximilians-Universität, Germany; A Westphal; University of California, Berkeley

2:15 PM 836 Connecting Lunar Meteorites to Source Terranes on the Moon; BL Jolliff, PK Carpenter, RL Korotev, SN North-Valencia, A Wittmann; Washington University, St. Louis; RA Zeigler; NASA Johnson Space Center


2:45 PM 838 Mineral Analyses of Extraterrestrial Metal; JI Goldstein; University of Massachusetts; PG Kotula, JR Michael; Sandia National Laboratories; GR Huss; University of Hawaii at Manoa

P04.01 Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges

Session Chairs:
Raul Arenal, Universidad de Zaragoza, Spain; Kazu Suenaga, National Institute of Advanced Industrial Science and Technology, Japan

Platform Session
Monday 1:30 PM • Room: 16

1:30 PM 864 (Invited) Irradiation-Induced Modifications and Beam-Driven Dynamics in Low-Dimensional Materials; J Kotakoski, FR Eder, M Clemens, JC Meyer; University of Vienna, Austria; U Kaiser; Universität Ulm, Germany

2:00 PM 865 M&M Post-Doctoral Researcher Awardee Evidence for Active Atomic Defects in Monolayer Hexagonal Boron Nitride; O Cretu, Y-C Lin, K Suenaga; National Institute of Advanced Industrial Science and Technology, Japan

2:15 PM 866 Polymorphic Structures of One-Dimensional Ionic Crystals Confined in Carbon Nanotubes; R Senga, L Zheng, K Hirose-Takai, K Suenaga; National Institute of Advanced Industrial Science and Technology, Japan

2:30 PM 867 Stabilization of Nanopores in Graphene; J Lee, M Chisholm; Oak Ridge National Laboratory; Z Yang; Institute of Metal Research; S Pennycook; University of Tennessee, Knoxville; S Panteides; Vanderbilt University

2:45 PM 868 Electronic Structure Modification of Boron and Nitrogen Ion-Implanted Graphene Fingerprinted by STEM-EELS; D Kepaptsoglou, Q Ramasse; SuperSTEM Laboratory; CR Seabourne, T Hardcastle, AJ Scott; University of Leeds, United Kingdom; R Nicholls; University of Oxford, United Kingdom; W Pierce, R Zan, U Bangert; University of Manchester, United Kingdom
Scientific Program

P08.01 Imaging and Analysis of Cultural Heritage Materials

Session Chairs:
Edward P. Vicenzi, Smithsonian Institution;
Marc Walton, Northwestern University;
Loïc Bertrand, Synchrotron SOLEIL, France

Platform Session
Monday 1:30 PM • Room: 26

1:30 PM 1000 (Invited) Application of Visible and Infrared Imaging Spectroscopy To Analyze Paintings; JK Delaney, K Dooley; National Gallery of Art

2:00 PM 1001 Examination of a 19th Century Daguerreotype Photograph using High Resolution Scanning Transmission Electron Microscopy for 2D and 3D Nanoscale Imaging and Analysis; EP Vicenzi; Smithsonian Institution; T Landin; FEI Company; AA Herzing; National Institute of Standards and Technology

2:15 PM 1002 Investigation of Atomic Layer Deposited Metal Oxide Layers for Conservation of Metal Cultural Heritage Objects*; AE Marquardt, EM Breitung, GW Rubloff, RJ Phaneuf; University of Maryland; T Drayman-Weisser, G Gates; The Walters Art Museum; E Vicenzi; Smithsonian Institution

2:30 PM 1003 (Invited) Deciphering Exceptional Preservation of Fossils Using Trace Elemental Imaging; P Gueriau; Muséum national d’Histoire naturelle, France
ADVANCES IN INSTRUMENTATION SYMPOSIA
MONDAY AFTERNOON

A01.P1 Oliver Wells Memorial Symposium on the Scanning Electron Microscope

Poster Session
Monday 3:30 PM • Exhibit Hall AB

3:30 PM 17 Study About Interpretation of Energy-Filtered BSE Image at Ultra Low Voltage Condition; Y Hashimoto, T Yokosuka, H Ito, S Takeuchi, M Sasakiama, M Konno; Hitachi High-Technologies Corporation, Japan
Poster # 1

Poster # 2

3:30 PM 19 Ionic Liquid Used for Charge Compensation for High-Resolution Imaging and Analysis in the FE-SEM; N Brodusch, H Demers, R Gauvin; McGill University, Canada
Poster # 3

3:30 PM 20 Optimization of Signal Detection in Scintillation Secondary Electron Detector for ESEM and SEM; P Čudek, J Jirák; Brno University of Technology, Czech Republic; V Neděla; Academy of Sciences of the Czech Republic
Poster # 4

3:30 PM 21 Measuring the Strain Sensitivity in Si (001) Electron Channeling Patterns Using Higher-order Laue Zone Line Shifts; J Lammatao, M De Graef, Y Picard; Carnegie Mellon University; L Chan, T Owens; TESCAN USA Inc.
Poster # 5

3:30 PM 22 Quantifying the Effect of Drilling Fluid Contamination on Cement Formation Hydraulic Bond Using Scanning Electron Microscopy; A Oyibo; Louisiana State University
Poster # 6

3:30 PM 23 The Application of GPGPU to Automatic Electron Gun Alignment in the Scanning Electron Microscope; DM Holburn, BC Breton, A Li; University of Cambridge, United Kingdom; NHM Caldwell; University Campus Suffolk, United Kingdom
Poster # 7

3:30 PM 24 Use of HfC(310) as a High Brightness Electron Sources for Advanced Imaging Applications; JM Lovell, WA Mackie, TW Curtis, GG Magera; Applied Physics Technologies, Inc.
Poster # 8

A04.P1 Electron Holography at the Atomic Scale and the Nanoscale

Poster Session
Monday 3:30 PM • Exhibit Hall AB

3:30 PM 134 Vector Field Tomography by Electron Holography; R Tsuneta, M Ikeda, S Ono, M Yamane, A Sugawara, K Harada, M Koguchi; Hitachi High Technologies America, Ltd.
Poster # 9

3:30 PM 135 Electron Holographic Tomography of Mean Free Path Lengths at the nm-scale; A Lubk, D Wolf, F Röder, H Lichte; Technische Universität Dresden, Germany
Poster # 10

3:30 PM 136 Hybridization of Off-Axis and In-line High-Resolution Electron Holography; C Ozsoy Keskinbora, PA van Aken; MPI for Intelligent Systems; CB Boothroyd, RE Dunin-Borkowski; Forschungszentrum Jülich GmbH, Germany; CT Koch; Universität Ulm, Germany
Poster # 11

3:30 PM 137 Superposition of Fraunhofer Diffractions from Fork-Shaped Gratings and their Openings with Electron Vortex Beam; K Harada, T Kohashi, T Iwane; Hitachi High Technologies America, Ltd.
Poster # 12

3:30 PM 138 Investigation of Effect of Electron Irradiation on Ionic Liquid Using Electron Holography; M Shirai; Hitachi High Technologies America, Ltd.; T Tanigaki, S Aizawa, HS Park; RIKEN, Japan; T Matsuda; Japan Science and Technology Agency; D Shindo; Tohoku University, Japan
Poster # 13

3:30 PM 139 M&M Post-Doctoral Researcher Awardee Electron Holography of the Magnetic Phase Shift of a Current-Carrying Wire; AH Tavabi, V Migunov, A Savenko, RE Dunin-Borkowski; Forschungszentrum Jülich GmbH, Germany
Poster # 14
Scientific Program

3:30 PM 140 Magnetic Characterization of Isolated CoFeB/Cu Nanowires by Off-Axis Electron Holography; A Akhtari-Zavareh, KL Kavanagh; Simon Fraser University, Canada; LP Carignan; Apollo Microwaves Ltd., Canada; A Yelon, D Menard; École Polytechnique de Montréal, Canada; T Kasama; Technical University of Denmark; R Herring; University of Victoria, Canada; R Dunin-Borkowski; Forschungszentrum Jülich GmbH, Germany; M McCartney; Arizona State University

3:30 PM 141 Lens-Less Foucault Imaging (LLFI) Method for Observing Magnetic Domain Walls; Y Taniguchi, H Matsumoto; Hitachi High-Technologies Corporation, Japan.; K Harada; Hitachi High Technologies America, Ltd.

3:30 PM 142 Study of Magnetic Domain Structure in Co(Fe)/Pd Multilayers using Off-axis Electron Holography; D Zhang, DJ Smith, MR McCartney; Arizona State University; JM Shaw; National Institute of Standards and Technology

3:30 PM 143 Imaging Perpendicular Magnetic Domains in Plan-view Using Lorentz Transmission Electron Microscopy; TR Kim, AL Koh, R Sinclair; Stanford University

3:30 PM 144 Evaluation of Doping in GaP Core-Shell Nanowire pn Junction by Off-Axis Electron Holography; S Yazdi, T Kasama, M Beleggia, JB Wagner; Technical University of Denmark; A Berg, MT Borgstrom; Lund University, Sweden

3:30 PM 145 Characterization of Metallic and Bimetallic Nanoparticles by Off-Axis Electron Holography; J Cantu-Valle, F Ruiz-Zepeda, U Santiago, F Mendoza-Santoyo, M Jose-Yacaman, A Ponce; University of Texas, San Antonio

3:30 PM 146 Propagation of Free Electrons Carrying Orbital Angular Momentum Through Magnetic Lenses; DW Shook, BJ McMorran; University of Oregon

A07.P1 Microscopy and Spectroscopy for Power Generation and Energy Storage

Poster Session
Monday 3:30 PM • Exhibit Hall AB

3:30 PM 228 Analyses of Interfaces in Wafer-Bonded Tandem Solar Cells by Aberration-Corrected STEM and EELS; D Haeussler; Faculty of Technology of Christian Albrechts University of Kiel, Germany; L Houben, RE Dunin-Borkowski; Research Centre Juelich GmbH, Germany; S Essig, F Dimroth; Fraunhofer-Institut für Solare Energetische Systeme ISE, Germany; W Jäger; Christian Albrechts University Kiel, Germany

3:30 PM 229 Electron Microscopy Study of the Desactivation of Nickel Based Catalysts for Bio Oil Hydrodeoxygenation; D Gardini, PM Mortensen, CD Damsgaard, PA Jensen, AD Jensen, JB Wagner; Technical University of Denmark; HWP Carvalho, J-D Grunwaldt; Karlsruhe Institute of Technology, Germany

3:30 PM 230 Atomic Level In situ Characterization of Metal/TiO₂ Photocatalysts under Light Irradiation in Water Vapor; L Zhang, P Crozier; Arizona State University

3:30 PM 231 Evaluation of Phase Segregation in Ternary Pt-Rh-SnO₂ Catalysts Prepared from the Vapor Phase; H Yu, R Maric; University of Connecticut; P Plachinda, L Zhang; FEI Company; M Vukmirovic, S Bliznakov, M Li; R Adzic; Brookhaven National Labs

3:30 PM 232 Probing Structure-Property Relationship of Active Metal Nanoparticles on Mesoporous Silica Sorbent; P Kumar, JS Jeong, B Elyassi, N Rajabbeigi, M Tsapatsis, AK Mkhoyan; University of Minnesota

3:30 PM 233 Effect of Yttrium (Y) and Zirconium (Zr) Doping on the Thermodynamical Stability of the Cubic Ba₉Sr₉Co₁₁₋ₓFe₄₋ₓO₃₊ₓ Phase; M Meffert, P Müller, H Störmer, L-S Unger, C Niedrig, SF Wagner, E Ivers-Tiffée, D Gerthsen; Karlsruhe Institute of Technology, Germany; S Saher, HJM Bouwmeester; University of Twente, Netherlands
### Scientific Program

**Monday August 4**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors/Institutes</th>
</tr>
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<tbody>
<tr>
<td>3:30 PM</td>
<td>234</td>
<td>Observation of Pt-Atom Complexes in CaTi$_1-x$Pt$<em>x$O$</em>{3-\delta}$</td>
<td>S Zhang, X Du, G Graham, X Pan; University of Michigan; M Katz; U.S. Naval Research Laboratory</td>
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<tr>
<td>3:30 PM</td>
<td>235</td>
<td>HAADF STEM of Phase Separated Anion Exchange Membranes Prepared by Ultracryomicrotomy</td>
<td>AC Jackson, FL Beyer III; US Army Research Laboratory; Y Li, DM Knauss; Colorado School of Mines; JR Nyzaka, YA Elabd; Drexel University; SD Walck; UIC Technical Services</td>
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<tr>
<td>3:30 PM</td>
<td>236</td>
<td>Effects of Sample Preparation Technique on Quantitative Analysis of Automotive Fuel Cell Catalyst Layers</td>
<td>LGdeA Melo, V Lee, GA Botton, AP Hitchcock; McMaster University, Canada; D Susac, V Berejnov, J Stumper; AFCC Automotive Fuel Cell Cooperation Corporation, Canada</td>
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<tr>
<td>3:30 PM</td>
<td>238</td>
<td>In situ TEM and Atomic-Resolution STEM Study of Highly Active Partially Ordered Ca,Pt Nanoparticles Used as PEM-Fuel Cells Catalyst</td>
<td>G Drazić, M Bele, A Pavliš, P Jovanovic, M Zorko, N Hojnik, B Jožinovič, M Gaberscek; National Institute of Chemistry, Slovenia</td>
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<tr>
<td>3:30 PM</td>
<td>239</td>
<td>STEM-EDS Characterization of Platinum-Modified Nickel Nanoparticles</td>
<td>DH Anjum, L Li; King Abdullah University of Science &amp; Technology (KAUST)</td>
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<td>3:30 PM</td>
<td>240</td>
<td>Aberration Corrected STEM Study on Pt$_{0.8}$Ni De-alloyed Nanocatalysts for Proton Exchange Membrane Fuel Cells</td>
<td>S Rasouli, P Ferreira; University of Texas at Austin; J Sharman, A Martinez, D Fongalland, G Hards; Johnson Matthey Technology Centre; T Yamamoto, K Higashida; Kyushu University; D Myers; Argonne National Laboratories</td>
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<td>3:30 PM</td>
<td>241</td>
<td>Degradation Mechanisms of Platinum Nanoparticle Catalysts in Proton Exchange Membrane Fuel Cells: The Role of Particle Size</td>
<td>K Yu, DJ Groom, PJ Ferreira; The University of Texas at Austin; X Wang, DJ Myers; Argonne National Laboratory; Z Yang, M Gummalla; United Technology Research Center; SC Ball; Johnson Matthey Technology Center</td>
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**A17.P1 Extended Crystal Defects: Quantification of Strain, Local Atomic Structure and Chemistry**

**Poster Session**

**Monday 3:30 PM • Exhibit Hall AB**

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<tr>
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<td>234</td>
<td>Observation of Pt-Atom Complexes in CaTi$_1-x$Pt$<em>x$O$</em>{3-\delta}$</td>
<td>S Zhang, X Du, G Graham, X Pan; University of Michigan; M Katz; U.S. Naval Research Laboratory</td>
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<td>3:30 PM</td>
<td>235</td>
<td>HAADF STEM of Phase Separated Anion Exchange Membranes Prepared by Ultracryomicrotomy</td>
<td>AC Jackson, FL Beyer III; US Army Research Laboratory; Y Li, DM Knauss; Colorado School of Mines; JR Nyzaka, YA Elabd; Drexel University; SD Walck; UIC Technical Services</td>
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<td>3:30 PM</td>
<td>236</td>
<td>Effects of Sample Preparation Technique on Quantitative Analysis of Automotive Fuel Cell Catalyst Layers</td>
<td>LGdeA Melo, V Lee, GA Botton, AP Hitchcock; McMaster University, Canada; D Susac, V Berejnov, J Stumper; AFCC Automotive Fuel Cell Cooperation Corporation, Canada</td>
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<td>238</td>
<td>In situ TEM and Atomic-Resolution STEM Study of Highly Active Partially Ordered Ca,Pt Nanoparticles Used as PEM-Fuel Cells Catalyst</td>
<td>G Drazić, M Bele, A Pavliš, P Jovanovic, M Zorko, N Hojnik, B Jožinovič, M Gaberscek; National Institute of Chemistry, Slovenia</td>
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<tr>
<td>3:30 PM</td>
<td>239</td>
<td>STEM-EDS Characterization of Platinum-Modified Nickel Nanoparticles</td>
<td>DH Anjum, L Li; King Abdullah University of Science &amp; Technology (KAUST)</td>
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<tr>
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<td>Aberration Corrected STEM Study on Pt$_{0.8}$Ni De-alloyed Nanocatalysts for Proton Exchange Membrane Fuel Cells</td>
<td>S Rasouli, P Ferreira; University of Texas at Austin; J Sharman, A Martinez, D Fongalland, G Hards; Johnson Matthey Technology Centre; T Yamamoto, K Higashida; Kyushu University; D Myers; Argonne National Laboratories</td>
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**A17.P1 Extended Crystal Defects: Quantification of Strain, Local Atomic Structure and Chemistry**

**Poster Session**

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</tbody>
</table>
### Scientific Program

#### 3:30 PM
- **536** Measurement of Local Atomic Displacements Reveals Interaction of Au Nanocrystals with Rutile (TiO₂) Surface Steps; W Gao, J-M Zuo; University of Illinois, Urbana-Champaign  
  Poster # 41

#### 3:30 PM
- **537** Atomic Resolution Study of Local Strains in Doped VO₂ Nanowires; H Asayesh-Ardakani; Michigan Technological University  
  Poster # 42

#### 3:30 PM
- **538** Strain Associated with Surface-Penetrating Dislocations Visible by Electron Channeling Contrast Imaging; M Liu, YN Picard; Carnegie Mellon University  
  Poster # 43

### A18.P1 Vendor Symposium: New Tools for Life and Materials Sciences

**Poster Session**

Monday 3:30 PM • Exhibit Hall AB

#### 3:30 PM
- **564** Are EDS Specifications Still Relevant; K Thompson; Thermo Fisher Scientific  
  Poster # 44

#### 3:30 PM
- **565** Introduction of a New Conventional SEM; JSM-IT300LV: The Observation of a Water Containing Specimen with a Cooling Stage at 650 Pa; N Inoue JEOL Ltd., Japan  
  Poster # 45

#### 3:30 PM
- **566** Advancements in Decontamination of Vacuum Systems Using Plasma Cleaning; R Vane, CA Moore; XEI Scientific  
  Poster # 46

#### 3:30 PM
- **567** Measurement of Downstream Charge Transport During Plasma Cleaning of Vacuum Chambers; CA Moore; XEI Scientific  
  Poster # 47

#### 3:30 PM
- **568** New X-ray Transparent and Light Tight Windows for EDS Detectors; M Bornschlegl, A Niculau, H Soltan, R Eckhardt, K Hermenau; PNDetector GmbH, Germany  
  Poster # 48

#### 3:30 PM
- **569** Geochemical Evaluation of Geopressed Geothermal Wellbore Cement; K Bello, M Radonjic; Louisiana State University  
  Poster # 49

#### 3:30 PM
- **570** Atomic Resolution Characterization of Ni-base Nanoparticles for Energy Devices; F Godinez, O Solorza-Feria; Cinvestav; C Kisielowski; Lawrence Berkeley National Laboratory; P Specht; University of California-Berkeley; HA Calderon; Instituto Politécnico Nacional, Mexico  
  Poster # 50

#### 3:30 PM
- **571** Functionalized Surfaces to Improve Imaging Conditions in Liquid Cell Transmission Electron Microscopy; JM Miller; Dune Sciences, Inc.; DH Alsem, N Salmon; Hummingbird Scientific; N Johnson, J Hutchison; University of Oregon  
  Poster # 51

#### 3:30 PM
- **572** A New In situ Broad Ion Beam, with Energy Range 1 – 500 eV; J Mulders, P Trompenaars, E Bosch, R Geurts; FEI Company  
  Poster # 52

#### 3:30 PM
- **573** On the Characterization of the Geometrical Collection Efficiency of Modern EDS Systems; R Terborg, M Falke, A Käppel; Bruker Nano GmbH, Germany; V-D Hodooroba; BAM Federal Institute for Materials Research and Testing, Germany  
  Poster # 53

#### 3:30 PM
- **574** Ultra-high-Resolution X-ray Microanalysis with a Cryogen-Free Microlorimeter Spectrometer; R Cantor, H Naito; STAR Cryoelectronics\ H.K.N. Inc.  
  Poster # 54

#### 3:30 PM
- **575** Solid State Backscattered Electron Detectors with Improved Image Contrast and Detection Speed; A Liebel, R Eckhardt, N Adrian, H Soltan; PNDetector GmbH, Germany  
  Poster # 55

#### 3:30 PM
- **576** A Double Silicon Drift Type Detector System for EDS with Ultrahigh Efficiency and Throughput for TEM; S Kawai, I Onishi, T Ishikawa, K Yagi, T Iwama, K Miyatake, Y Iwasawa, M Matsushita, T Kaneyama, Y Kondo JEOL Ltd., Japan  
  Poster # 56

#### 3:30 PM
- **577** Development of Au-GCIB Dynamic SIMS and Cluster Size Filtering System; M Nojima, M Suzuki, T Adachi; Tokyo University of Science; S Hotta; Office Tandem. LCC.; M Fuji, T Seki, J Matsu; Kyoto University  
  Poster # 57
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Poster #</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30 PM</td>
<td>578</td>
<td>Observation of Wet Samples Using a Novel Atmospheric Scanning Electron Microscope</td>
<td>Y Ominami, S Kawanishi, S Ito; Hitachi High-Technologies Corporation, Japan; T Ushiki; Niigata University</td>
<td>58</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>579</td>
<td>High-Flux Monochromatic Electron and Ion Beams from Laser Cooled Atoms</td>
<td>AJ McCalloch, Y Bruneau, G Khalili, D Compart; Laboratoire Aimé Cotton</td>
<td>59</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>580</td>
<td>Typhon: Multiplexed TEM Sample Preparation</td>
<td>S Mulligan, T Jain, JA Speir, A Cheng, B Carragher, CS Potter; The Scripps Research Institute; E Duggan, E Liu, J Nolan; La Jolla Bioengineering Institute</td>
<td>60</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>581</td>
<td>Measurement of Detection Efficiency in Atom Probe Tomography</td>
<td>TJ Pros, BP Geiser, RM Ulfig, TF Kelly, DJ Larson; CAMECA Instruments, Inc.</td>
<td>61</td>
</tr>
</tbody>
</table>

**BIOLOGICAL SCIENCES SYMPOSIA**

**MONDAY AFTERNOON**

**B02.P1 Microbes and Microbial Communities**

**Poster Session**
Monday 3:30 PM • Exhibit Hall AB

<table>
<thead>
<tr>
<th>Time</th>
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<th>Poster #</th>
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</thead>
<tbody>
<tr>
<td>3:30 PM</td>
<td>596</td>
<td>Adhesion of A. actinomycetemcomitans to Host Components of the Extracellular Matrix</td>
<td>F Azari, M Radermacher, KP Mintz, T Ruiz; University of Vermont</td>
<td>62</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>597</td>
<td>Correlative Imaging and Analyses of Soil Organic Matter in the Rhizosphere</td>
<td>AC Dohnalkova, T Varga; Pacific Northwest National Laboratory</td>
<td>63</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>598</td>
<td>Non Spore-Forming Bacteria: Sterility and Ultrastructure Study</td>
<td>RM Hannah, CA Brantner, JP Burans, RK Pope; National Biodefense Analysis and Countermeasures Center</td>
<td>64</td>
</tr>
</tbody>
</table>
Scientific Program

3:30 PM  670  Electron and Helium Ion Imaging of Arabidopsis Affected by Genetic Mutation and Thermochemical Treatment for Biofuel Applications; AE Curtin, AN Chiaromonti, AW Sanders; National Institute of Standards and Technology; PN Ciesielski, BS Donohoe; National Renewable Energy Laboratory; C Chapple, N Mosier; Purdue University

Poster #  73

3:30 PM  671  RIMAPS Analysis as a Tool to Elucidate Ascospore Ornamentation Pattern; SM Romero; Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina; RM Comerio, EA Favret; Instituto Nacional de Tecnologia Agropecuaria, Argentina

Poster #  74

B12.P1 Biological Sciences - General

Poster Session
Monday 3:30 PM • Exhibit Hall AB

3:30 PM  715  Observations On The Ultrastructure Of The Naked Freshwater Flagellate Chrysochromulina tobin sp. nov. (Haptophyta); S Barlow; San Diego State University; RA Cattolico; University of Washington

Poster #  75

3:30 PM  716  Synchrotron Chemical and Structural Analysis of Tyrannosaurus rex Blood Vessels: The Contribution of Collagen Hypercrosslinking to Tissue Longevity; EM Boatman, R Gronsky; University of California, Berkeley; MB Goodwin; University of California Museum of Paleontology; H-Y Holman, S Fakra; Lawrence Berkeley National Laboratory; MH Schweitzer; North Carolina State University; JR Horner; Museum of the Rockies

Poster #  76

3:30 PM  717  A Novel Method to Manipulate Osteoblastic Differentiation; D Batarseh, A Calabro, C Queenan, D Leonardi; Bergen County Academies

Poster #  77

3:30 PM  718  Cell Ultrastructure and Distribution of Trifluoroacetylated Protein-Adducts in Early Hepatic Injury in Mice Induced by Inhalation Anesthetic, Halothane; CA Brantner, M Bourdi, M Chakraborty, LR Pohl, MP Daniels; National Institutes of Health

Poster #  78

3:30 PM  719  M&M Student Awardee A study of unidirectionally aligned collagen-silk composite fibers and the application in hdpPSC neural differentiation; B Zhu, W Li, C Segre, R Janota, N Chi, R Wang; Illinois Institute of Technology; R Lewis; Utah State University

Poster #  79

3:30 PM  720  M&M Student Awardee Automated Cell Counting in a High Density, Polymer-Coated, Live Single Cell Sandwich Microarray; JR Yaron, J Pan, KB Lee, K-C Wang, CL Anderson, HL Glenn, DR Meldrum, T Borkar; Arizona State University

Poster #  80

B13.P1 Specimen Preparation for Biological Sciences

Poster Session
Monday 3:30 PM • Exhibit Hall AB

3:30 PM  721  Testing the Validity of “Old Wives Tales” About Fixation of Tissue Cultured Cells; PS Connelly; National Institutes of Health

Poster #  81

3:30 PM  722  Cryo-Planing of Small Biological Specimens for SEM Using mPrep Capsules; WC Plumley; Ohio State University

Poster #  82

PHYSICAL SCIENCES SYMPOSIA
MONDAY AFTERNOON

P02.P1 Advances in In situ Microscopy

Poster Session
Monday 3:30 PM • Exhibit Hall AB

3:30 PM  799  Measurement of Local Specimen Temperature under Flowing Gas Ambient in the Environmental Scanning Transmission Electron Microscope (ESTEM) using Diffraction; JP Winterstein, PA Lin, R Sharma; National Institute of Standards and Technology

Poster #  83

3:30 PM  800  Electric Field Induced Au Nanocrystal Formation in Aqueous Solutions; JH Park, SK Kodambaka; University of California, Los Angeles; MC Reuter, FM Ross; IBM T.J. Watson Research Center

Poster #  84
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>3:30 PM</td>
<td><strong>801</strong> In situ Observation of Directed Nanoparticle Aggregation During the Synthesis of Ordered Nanoporous Metal in Soft Templates; LR Parent, P Abellan, JE Evans, ND Browning, I Arslan; Pacific Northwest National Laboratory; DB Robinson, PJ Cappillino; Sandia National Laboratories, Livermore</td>
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<td>Poster # 85</td>
</tr>
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<td>3:30 PM</td>
<td><strong>802</strong> In situ TEM Study of the Corrosion Behavior of Zry-4; W Harlow, H Ghassemi, ML Taheri; Drexel University</td>
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<td></td>
<td>Poster # 86</td>
</tr>
<tr>
<td>3:30 PM</td>
<td><strong>803</strong> Protein-Mediated Nucleation of Nanoparticles In situ; S Kashyap, TJ Woehl, T Prozorov; US DOE Ames Laboratory; MS Sanchez-Quesada; University of Granada, Spain</td>
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<td>Poster # 87</td>
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<td>3:30 PM</td>
<td><strong>804</strong> Automated Spatial Alignment of Video Frame Data from In situ Experiments; JD Sugar, AW Cummings, DB Robinson; Sandia National Laboratories, Livermore; BW Jacobs; Protochips, Inc.</td>
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<td>Poster # 87</td>
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<td>3:30 PM</td>
<td><strong>805</strong> MSA Robert P. Apkarian Memorial Scholarship (Physical Sciences) Direct Observation of Li₂O₂ Nucleation and Growth with In situ Liquid ec-(S)TEM; BL Mehdi, EN Nasybulin, W Xu, E Thomsen, MH Engelhard, RC Masse, W Bennett, J-G Zhang, Z Nie, ND Browning; Pacific Northwest National Laboratory</td>
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<td>Poster # 88</td>
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<td>3:30 PM</td>
<td><strong>806</strong> Nanobubbles on Electron Transparent Electrodes; JJ Lodico, ER White, G Carlson, BD Parks, A Kerelsky, BC Regan; University of California, Los Angeles</td>
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<td>Poster # 89</td>
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<td>3:30 PM</td>
<td><strong>807</strong> Direct Observation of Aggregative Nanoparticle Growth: Kinetic Modeling of the Size Distribution and Growth Rate; TJ Woehl, WD Ristenpart; University of California, Davis; C Park; Florida State University; JE Evans, I Arslan, ND Browning; Pacific Northwest National Laboratory</td>
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<td><strong>808</strong> In situ Liquid Transmission Electron Microscopy (TEM) for the Analysis of Metal Organic Frameworks (MOFs); JP Patterson; University of California, San Diego</td>
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<td>Poster # 92</td>
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<td>3:30 PM</td>
<td><strong>809</strong> Environmental Electron Microscopy: Electron Beam Effects in Electrochemistry; SJ Dillon, Y Liu; University of Illinois, Urbana-Champaign</td>
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<td>Poster # 93</td>
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<td>3:30 PM</td>
<td><strong>810</strong> Tackling Reversible Conversion Reaction Mechanism for Lithium Based Battery; L Luo, J Wu, J Xu, VC Dravid; Northwestern University</td>
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<td>Poster # 94</td>
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<td>3:30 PM</td>
<td><strong>811</strong> Reversible In situ TEM Electrochemical Studies of Fluoride Ion Battery; VSK Chakravadhanula, MH Fawey, C Kuebel, T Scherer, C Rongeat, AR Munnangi, M Fichtner, H Hahn; Karlsruhe Institute of Technology, Germany</td>
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<td>Poster # 95</td>
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<td><strong>812</strong> Novel Sample Preparation for Operando TEM Studies; BK Miller, TM Barker, PA Crozier; Arizona State University</td>
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<td><strong>813</strong> Direct Observation of Electrolyte Degradation Mechanisms in Li-Ion Batteries; BL Mehdi, P Abellan, LR Parent, W Xu, Y Zhang, I Arslan, J-G Zhang, C Wang, ND Browning, JE Evans; Pacific Northwest National Laboratory</td>
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<td>Poster # 97</td>
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<td><strong>P04.P1</strong> Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges</td>
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<td>Monday 3:30 PM • Exhibit Hall AB</td>
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<td>Poster # 98</td>
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<td>3:30 PM</td>
<td><strong>888</strong> A New Structural Model for Graphene Oxide and Reduced Graphene Oxide as Revealed by Core EELS and DFT; A Tararan, A Zobelli, O Stephani; Université Paris-Sud, France; A Benito, W Masers; Instituto de Carbonquimica ICB-CSIC, Spain</td>
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<td>3:30 PM</td>
<td><strong>889</strong> IUMAS-6 Early Career Scholar Morphology and Structure Analysis of Graphene by Low Voltage TEM; Y Cho, J-M Yang, YC Park; National Nanofab Center; DV Lam, S-M Lee, J-H Kim; Korea Institute of Machinery &amp; Materials, South Korea; J Chang; Korea Maritime and Ocean University, South Korea</td>
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<td>Poster # 100</td>
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</table>
Scientific Program

3:30 PM 890 Asymmetric Decoration of Crystalline Graphene with Pt&TiO₂ Nanocrystals as High-Efficient Photocatalyst; W Qian; Portland State University

Poster # 101

3:30 PM 891 A Green Method for Graphite Exfoliation, Effect of Milling Intensity; I Estrada-Guel, C Carreño-Gallardo, R Martínez-Sánchez; Centro de Investigación en Materiales Avanzados, Mexico; FC Robles-Hernandez; University of Houston

Poster # 102

3:30 PM 892 Al₄C₃/Ag Formation in an Aluminum Composite Produced by High-Energy Ball Milling; JM Mendoza-Duarte, I Estrada-Guel, C Carreño-Gallardo, R Martínez-Sánchez; Centro de Investigación en Materiales Avanzados, Mexico

Poster # 103

3:30 PM 893 FIB, TEM and AFM Quantitative Investigation of Nanostructure and Nano Scale Friction Properties of Single Partially Fluorinated Carbon Nanofibres; P Bilas; Université des Antilles et de la Guyane, Guadeloupe

Poster # 104

3:30 PM 894 Electron Diffraction-Based Quality Evaluation of Graphene Films; K Bosnick, M Malac, K Cui, R Indoe; National Research Council Canada

Poster # 105

3:30 PM 895 π-Plasmon Dispersion in Free-Standing Monolayer Graphene Investigated by Momentum-Resolved Electron Energy-Loss Spectroscopy; S-C Liou, R Breitwieser, CH Chen, WW Pai, GY Guo, M-W Chu; National Taiwan University

Poster # 106

3:30 PM 896 IUMAS-6 Early Career Scholar A Study of Single-Walled Carbon Nanotube Cap Structure Using Field Emission Image; M Irita, Y Homma; Tokyo University of Science

Poster # 107

3:30 PM 897 Ordered and Disordered Carbon Structures Detected by TEM in Carbidic-Derived Carbons Produced from TiC; P González-Garcia, L Garcia-Gonzalez; Universidad Veracruzana; E Urones-Garrote, D Ávila-Brande; Universidad Complutense de Madrid; LC Otero-Diaz; Universidad Complutense

Poster # 108

3:30 PM 898 Analytical Transmission Electron Microscopy investigation of the Fluorination Process of Carbon Nanoparticles; J-L Mansot, F Begarin, A Molza, P Thomas; Université des Antilles et de la Guyane; M Dubois, A Hamwi, K Guerin; Université Blaise Pascal

Poster # 109

3:30 PM 899 Determining the Thickness of Atomically Thin MoS₂ and WS₂ in the TEM; RJ Wu, ML Odlyzko, A Mkhoyan; University of Minnesota

Poster # 110

3:30 PM 900 Immobilization and Encapsulation of Micro- and Nano- Objects with Electron Transparent Graphene Oxide Membranes; A Yulaev; University of Maryland; A Lipatov, A Sinitskii; University of Nebraska, Lincoln; A Kolmakov; National Institute of Standards and Technology

Poster # 111

P08.P1 Imaging and Analysis of Cultural Heritage Materials

Poster Session
Monday 3:30 PM • Exhibit Hall AB

3:30 PM 1016 Detecting Iron-Based Pigments in Ruthenium-Coated Archaeological Pottery by SEM-EDS and by Micro-XRF-SEM; MW Pendleton; Texas A&M University; DK Washburn; University of Pennsylvania; EA Ellis; Microscopy Consulting Technologist; BB Pendleton; West Texas A&M University

Poster # 112

3:30 PM 1017 Nanometer-Scale Proximal Probe Thermal Desorption Coupled with Laser Mass Spectrometry; SC Owens, J Berenbeim, MS de Vries; University of California, Santa Barbara; C Schmidt Patterson; Getty Conservation Institute; E Dillon; Anasys Instruments

Poster # 113
Scientific Program

3:30 PM  **1018** *Investigation on Manufacturing Process in Some Elamite Copper Alloy Artefacts from Haft Tappeh, Southwest Iran;* O Oudbashi; Art University of Isfahan, Iran; P Davami; Sharif University of Technology, Iran

Poster #  **114**

3:30 PM  **1019** *SEM and ToF-SIMS Ion Imaging Applied to Characterization of Fungal Biodeterioration of Paper in the Context of Cultural Heritage Collections;* HM Szczepanowska, Y Goreva; Smithsonian Institution

Poster #  **115**

3:30 PM  **1020** *Investigating the Firing Protocol of Athenian Pottery Production: A Raman and Hi-Resolution TEM Study;* I Cianchetta, K Trentelman; Getty Conservation Institute; MS Walton; Northwestern University; A Mehta; SLAC National Accelerator Laboratory; B Foran; The Aerospace Corporation

Poster #  **116**

3:30 PM  **1021** *Soft X-ray Absorption Spectroscopy and Imaging of Sulfur in Lapis Lazuli;* M Walton; Northwestern University; A Gambardella, CM Patterson; Getty Conservation Institute

Poster #  **117**

3:30 PM  **1022** *Investigation into Achaemenid Persian Painted Plasters and Glazed Bricks from Persepolis and Pasargad; in the Smithsonian’s Freer Gallery of Art;* E Aloiz, A Nagel, J Douglas; Smithsonian Institution

Poster #  **118**

3:30 PM  **1023** *Manganese in Black Crusts on Seneca Sandstone;* CA Grissom, EP Vicenzi, E Aloiz, N Little, J Giaccai; Smithsonian Institution; RA Livingston, W Freedman; University of Maryland

Poster #  **119**
Tuesday, August 5, 2014

ADVANCES IN INSTRUMENTATION SYMPOSIA
TUESDAY MORNING

A01.02 Oliver Wells Memorial Symposium on the Scanning Electron Microscope
Session Chairs:
Lynne M. Gignac, IBM T. J. Watson Research Center;
David C. Joy, University of Tennessee;
Brendan J. Griffin, University of Western Australia
Platform Session
Tuesday 8:30 AM • Room: 24

8:30 AM  5 (Invited) Oliver Wells: My Recollections; F Pease; Stanford University
9:00 AM  6 (Invited) Improved SEM Image Resolution Through the Use of Image Restoration Techniques; E Lifshin; University at Albany
9:30 AM  7 Ollie was Right! A Review of Angular Dependence, Detector Bandwidth and Sample Preparation on Contrast in Secondary and Backscattered Electron Images in the SEM; B J Griffin; The University of Western Australia; D C Joy; Oak Ridge National Laboratory; J R Michael; Sandia National Laboratories

A02.01 Advances in Imaging and Spectroscopy in STEM
Session Chairs:
Nigel D. Browning, Pacific Northwest National Laboratory;
Peter D. Nellist, University of Oxford, United Kingdom;
Maria Varela del Arco, Oak Ridge National Laboratory
Platform Session
Tuesday 8:30 AM • Room: 14

8:30 AM  25 (Invited) Tracking Dopant Diffusion Pathways Inside Bulk Materials; S Pennycook; The University of Tennessee, Knoxville; R Ishikawa, A Lupini, R Mishra; Oak Ridge National Laboratory; S Findlay; Monash University, Australia; S Pantelides; Vanderbilt University

9:00 AM  26 Three-Dimensional Observation of Dopant Atoms in Quantitative Scanning Transmission Electron Microscopy; J Hwang, JY Zhang, S Stemmer; University of California, Santa Barbara; A D’Alfonso, LJ Allen; University of Melbourne, Australia
9:15 AM  27 M&M Student Awardee Study of Oxygen Distortions in Titanate – Manganite Interfaces by Aberration Corrected STEM-EELS; G Sanchez-Santolino, J Tornos, M Cabero, J Garcia-Barriocanal, C Leon, J Santamaria; Universidad Complutense de Madrid, Spain; M Varela; Oak Ridge National Laboratory; SJ Pennycook; University of Tennessee, Knoxville
9:30 AM  28 (Invited) Chemical Analysis with Single Atom Sensitivity Using Aberration-Corrected STEM; R Klie, A Gulec, J Liu, T Paulauskas, P Phillips, C Wang, R Meyer; University of Illinois, Chicago

A04.02 Electron Holography at the Atomic Scale and the Nanoscale
Session Chairs:
H. Lichte, Technische Universität Dresden, Germany;
D.J. Smith, Arizona State University
Platform Session
Tuesday 8:30 AM • Marriott Ballroom B

8:30 AM  126 (Invited) Electron Holography of CMOS Devices with Epitaxial Layers; MA Gribelyuk, V Ontalus, FH Baumann; IBM; TN Adam; SUNY College of Nanoscale Science and Engineering; P Ronsheim; self employed
9:00 AM  127 (Invited) Field Mapping in Semiconductors by Off-axis Electron Holography: From Devices to Graphene and Single Dopant Atoms; RE Dunin-Borkowski; Forschungszentrum Jülich, GmbH, Germany; J-L Rouviere, D Cooper; CEA-LETI Minatec, France
9:30 AM  128 In situ Biasing of Tapered Si-Ge NW Heterojunctions using Off-Axis Electron Holography; Z Gan, D Smith, M McCartney; Arizona State University; D Perea, Y He, R Colby, M Gu, C Wang; Pacific Northwest National Laboratory; Y Jinkyoung, T Picraux; Los Alamos National Laboratory
9:45 AM  129 Characterization of N-polar GaN/AlGaN/GaN Heterostructures Using Electron Holography; A Boley, MR McCartney, DJ Smith; Arizona State University; DF Storm; U.S. Naval Research Laboratory
Scientific Program

A07.02 Microscopy and Spectroscopy for Power Generation and Energy Storage

Session Chairs:
Doug Perovic, University of Toronto, Canada; Feng Wang, Brookhaven National Laboratory

Platform Session
Tuesday 8:30 AM • Room: 15

8:30 AM 202 (Invited) Artificial Photosynthesis: Solar Fuels Nanomaterials; D Perovic; University of Toronto, Canada

9:00 AM 203 Atom Dynamics at the Gas-Catalysts Interface with Atomic Resolution; C Kisielowski; National Center for Electron Microscopy; S Helveg; Haldor Topsoe A/S; G Yuan; Lawrence Berkeley National Laboratory; H Frei; Joint Center for Artificial Photosynthesis

9:15 AM 204 IUMAS-6 Early Career Scholar Plasma Synthesis of Facetted Nickel nano-Ferrites with Controlled Stoichiometry; S Bastien, N Braidy; Université de Sherbrooke, Canada; C Ricolleau; University of Paris VII: Denis Diderot, France

9:30 AM 205 Atomic and Electronic Structure of γFe2O3/Cu2O Heterostructured Nanocrystals; Q Qiao, M Varela; Oak Ridge National Laboratory; P Mirtchev, DD Perovic, G Ozin; Vanderbilt University; MA Roldan; Universidad Complutense de Madrid, Spain; SJ Pennycook; University of Tennessee

9:45 AM 206 Structural Changes of Ta2O5 Photocatalyst under Reaction Conditions; Q Liu, P Crozier; Arizona State University

A15.01 Cs-Correctors: Current State and Ongoing Developments

Session Chairs:
Max Haider, CEOS GmbH, Germany; Rolf Erni, EMPA Switzerland

Platform Session
Tuesday 8:30 AM • Room: 22

8:30 AM 461 (Invited) Lifetime of Optical States in Transmission Electron Microscopy; J Barthel; RWTH Aachen University, Germany; T Andreas; Forschungszentrum Jülich GmbH, Germany

9:00 AM 462 (Invited) Performance and Stability of Aberration-Corrected STEMs: a User’s Perspective; D Kepaptsoglou, D Mücke-Herzberg, G Vaugan, Q Ramasse; SuperSTEM Laboratory, United Kingdom; AR Lupini; Oak Ridge National Laboratory

9:30 AM 463 On Proper Phase Contrast Imaging in Aberration Corrected TEM; P Hartel, M Linck, F Kahl, H Mueller, M Haider; CEOS GmbH, Germany

9:45 AM 464 Tuning High Order Geometric Aberrations in Quadrupole-Octapole Correctors; N Dellby, GJ Corbin, Z Dellby, TC Lovejoy, ZS Szilagyi, O. Krivanek; Nion; MF Chisholm; Oak Ridge National Laboratory

A16.02 Correlative Microscopy and Microanalysis from Macro to Pico

Session Chairs:
Brian P. Gorman, Colorado School of Mines; Christoper J. Gilpin, Purdue University; Mor Baram, McMaster University, Canada

Platform Session
Tuesday 8:30 AM • Room: 21

8:30 AM 481 (Invited) From Micro to Nano: Correlative 3D Microscopies for Analysis of Biointerfaces; A Palmquist; University of Gothenburg, Sweden; K Grandfield; McMaster University, Canada

9:00 AM 482 M&M Student Awardee Investigating the Effects of a Heat Treatment on Microstructure of an Ultrahigh Carbon Steel through SEM and In situ CLSM studies; MD Hecht, BA Webler, YN Picard; Carnegie Mellon University

9:15 AM 483 SIMS Based Correlative Microscopy for High-Resolution High-Sensitivity Nano-Analytics; T Wirtz, D Dowsett, S Eswaree Moorthy, Y Fleming; Centre de Recherche Public - Gabriel Lippmann, Luxembourg

9:30 AM 484 (Invited) In situ EM Characterization of Li-ion Battery Through Multiple Cycles; SJ Dillon, KW Noh; University of Illinois Urbana-Champaign
A17.02 Extended Crystal Defects: Quantification of Strain, Local Atomic Structure and Chemistry

Session Chairs:
Douglas L. Medlin, Sandia National Laboratories;
Jim Ciston, Lawrence Berkeley National Laboratory;
Yoosuf N. Picard, Carnegie Mellon University

Platform Session
Tuesday 8:30 AM • Room: 12

8:30 AM 513 (Invited) Metadislocations in Complex Metallic Alloys; M Heggen; Ernst Ruska-Centrum & Peter Grünberg Institut, Germany

9:00 AM 514 Sub-nanometer Resolution Chemi-STEM EDS Mapping of Superlattice Intrinsuc Stacking Faults in Co-based Superalloys; MS Titus, TM Pollock; University of California, Santa Barbara; A Suzuki; GE Global Research Center; MJ Mills; The Ohio State University

9:15 AM 515 Using Bethe Potentials in the Scattering Matrix for Defect Image Simulations; A Wang, M DeGraef; Carnegie Mellon University

9:30 AM 516 (Invited) STEM-Based Characterization of Dislocations and Stacking Faults in Structural Materials; TL Smith, ML Bowers, MJ Mills; The Ohio State University; M DeGraef; Carnegie Mellon University

A18.02 Vendor Symposium: New Tools for Life and Materials Sciences

Session Chairs:
Alice C. Dohnalkova, Pacific Northwest National Laboratory;
Elizabeth R. Wright, Emory University;
Mark A. Sanders, University of Minnesota

Platform Session
Tuesday 8:30 AM • Room: 25

8:30 AM 551 Optimized Electron Column and Detection Scheme for Advanced Imaging and Analysis of Metals; D Wall, F-C Sasam, T Vystavel, P Wandrol; FEI Company

8:45 AM 552 New High-Resolution Low-Voltage and High Performance Analytical FIB-SEM System; I Jiruš, M Havelka, M Haničíček, J Polster, T Hrnčíř; TESCAN Brno, s.r.o., Czech Republic

9:00 AM 553 Automated SEM Analysis in Industrial Process Control and Scientific Research; C Lang, A Hyde, M Hiscock, S Burgess, J Holland, P Statham; Oxford Instruments NanoAnalysis, United Kingdom

9:15 AM 555 Using Nion Swift for Data Collection, Processing, Display and Analysis; CE Meyer, N Dellby, Z Dellby, GS Skone, OL Krivanek; Nion Company

9:30 AM 556 Enabling Future Nanotomography and Nanofabrication with Crossbeam technology; I Schulmeyer, M Kienle; Carl Zeiss Microscopy GmbH, Germany

9:45 AM 557 AFM integrated with SEM/FIB for complete 3D metrology measurements; A Lewis; Hebrew University; A Komissar, O Fedoroyov, E Maayan; Nanonics Imaging; A Ignatov; Nanonics, Israel

BIOLOGICAL SCIENCES SYMPOSIA
TUESDAY MORNING

B01.01 Dr. Gerard Simon Memorial Symposium on Anatomic Pathology

Session Chairs:
Sara E. Miller, Duke University;
Pierre-Mathieu Charest, Université Laval, Canada

Platform Session
Tuesday 8:30 AM • Room: 27

8:30 AM 582 Gérard T. Simon, a Visionary of Microscopy in Canada; PM Charest; Université Laval, Canada

8:45 AM 583 (Invited) Look Closely: Lessons Prof. Gérard T. Simon Might Have Taught; DN Howell; Duke University

9:15 AM 584 (Invited) Discovery of New Nucleo Cytoplasmic Large Deoxiriboviruses by Transmission Electron Microscopy; AP deMatos; Centro de Investigacao Interdisciplinary Egas Moniz, Portugal; MF Caeiro; University of Aveiro, Portugal; RE Marschang; Laboklin GmbH & Co. KG; I Paperna; Hebrew University of Jerusalem, Israel
B02.02 Microbes and Microbial Communities
Session Chairs:
Elizabeth R. Wright, Emory University;
Teresa Ruiz, University of Vermont;
Gary Dunny, University of Minnesota

Platform Session
Tuesday 8:30 AM • Room: 17

8:30 AM 592 (Invited) Analyzing Secondary Metabolite Production by 3D Printed Bacterial Populations Using Scanning Electrochemical Microscopy; M Whiteley, J Connell, J Kim, J Shear, A Bard; University of Texas, Austin

9:00 AM 593 Staphylococcal Colonization of E-beam Patterned Surfaces; Y Wang, M Libera; Stevens Institute of Technology; JF da Silva Domingues, G Subbiahdoss, HC van der Mei, HJ Busscher; University Medical Center Groningen, Netherlands

9:15 AM 594 High Resolution Electron and Ion Microscopy of Photosynthetic Complexes; BW Arey, AC Dohnalkova, DW Koppenaal; Pacific Northwest National Laboratory; M Liberton, HB Pakrasi; Washington University

9:30 AM 595 (Invited) Spatial Distribution of Respiratory Metabolisms in Lab-Grown and In Vivo Pseudomonas aeruginosa Biofilms; RC Hunter; University of Minnesota

B06.02 Microanalysis of Biological Materials
Session Chairs:
Peta L. Clode, University of Western Australia;
Richard D. Leapman, National Institutes of Health

Platform Session
Tuesday 8:30 AM • Room: 23

8:30 AM 654 (Invited) Biological X-ray Fluorescence Microscopy: Advances and Unique Opportunities; S Vogt; Argonne National Laboratory

9:00 AM 655 (Invited) Correlative X-ray and Electron Spectroscopy of the Materials-Biology Interface Reveals Insights Into Impact of Engineered Nanomaterials on Human Physiology; A Porter; Imperial College London, United Kingdom

9:30 AM 656 Microscopy and Microanalysis of Mineral Particles in Lung Biopsies of Iraq and Afghanistan Deployers, Normal Controls, and Autoimmune Lung Disease Controls; HA Lowers, T Todorov, G Breit, GP Meeker, GS Plumlee; U.S. Geological Survey; M Robinson, R Meehan, G Cosgrove, M Strand, S Dhoma, S Groshong, C Rose; National Jewish Health; R Miller; Vanderbilt University

9:45 AM 657 (Invited) An In Ovo Investigation of the Ultrastructural Effects of the Heavy Metals Cadmium and Chromium on Liver Tissue; C Venter, HM Oberholzer, H Taute, MJ Bester, CF van der Merwe; University of Pretoria, South Africa

PHYSICAL SCIENCES SYMPOSIAS
TUESDAY MORNING

P02.02 Advances in In situ Microscopy
Session Chairs:
David A. Muller, Cornell University;
Haimei Zheng, Lawrence Berkeley National Laboratory;
Adam P. Hitchcock, McMaster University, Canada;
Thomas LaGrange, Lawrence Livermore National Laboratory

Platform Session
Tuesday 8:30 AM • Marriott Ballroom C

8:30 AM 757 Atomic Level In situ Characterization of NiO-TiO2 Photocatalysts under Light Irradiation in Water Vapor; L Zhang, P Crozier; Arizona State University

8:45 AM 758 M&M Professional Technical Staff Award Novel Hybrid Specimen Preparation Method for In situ Liquid Cell TEM Analysis; X Zhong, G Burke, SJ Haigh, S Schilling; University of Manchester, United Kingdom; MA Kulzick; BP Research Centre; NJ Zaluzec; Argonne National Laboratory

9:00 AM 759 Radiolysis during Liquid Cell Electron Microscopy; NM Schneider, MM Norton, BJ Mendel, JM Grogan, HH Bau; University of Pennsylvania; FM Ross; IBM T. J. Watson Research Center

9:15 AM 760 X-Ray and Electron Energy Loss Spectroscopy in Liquids in the Analytical S/TEM; NJ Zaluzec, A Demortiere, RE Cook, RE Koritala, J Wen, DJ Miller; Argonne National Laboratory; MA Kulzick; BP Corporate Research Center
Scientific Program

9:30 AM 761 M&M Student Awardee High Resolution In situ Study of Reactions in Graphene Liquid Cells; C Wang, Q Qiao, R Klie; University of Illinois, Chicago; T Shokuhfar; Michigan Technological University

9:45 AM 762 In situ Synthesis of New Electrode Materials for Li-Ions Batteries using a Cold FEG Environmental HRTEM; ML Trudeau, R Veillette, K Zaghib; Hydro-Quebec Research Institute, Canada; JY Howe; Hitachi High Technologies Canada

P03.02 Mineral Analyses from Laboratory to Spacecraft

Session Chairs:
Rhonda M. Stroud, U.S. Naval Research Laboratory; Zack Gainsforth, University of California at Berkeley

Platform Session
Tuesday 8:30 AM • Room: 11

8:30 AM 839 (Invited) Atom-Probe Tomography of Meteoritic Nanodiamonds; PR Heck, SS Rout; The Field Museum of Natural History; D Isheim, DN Seidman; Northwestern University; MJ Pellin, AV Sumant, JW Elam, J Hiller, A Mane, MR Savina; Argonne National Laboratory; AM Davis, T Stephan; The University of Chicago; O Auciello; University of Texas-Dallas; DJ Larson; CAMECA Instruments, Inc.

9:00 AM 840 Geological Applications of Atom Probe Tomography: New Information from Old Rocks; JW Valley, T Ushikubo, MJ Spicuzza; University of Wisconsin; AJ Cavosie; University of Puerto Rico; DA Reinhard, DF Lawrence, DJ Larson, PH Clifton, TF Kelly; CAMECA Instruments, Inc.; SA Wilde; Curtin University; DE Moser; University of Western Ontario, Canada

9:15 AM 841 (Invited) Successes and Challenges of Laser-Induced Breakdown Spectroscopy (LIBS) Applied to Chemical Analyses of Geological Samples; MD Dyar, EA Breves; Mount Holyoke College; TF Boucher, S Mahadevan; University of Massachusetts, Amherst

9:45 AM 842 Trace Element Analysis in Geochemical Systems by STEM/EDS; Z Gainsforth, AL Butterworth, AJ Westphal; University of California, Berkeley; K Bustillo; Lawrence Berkeley National Laboratory; RC Oglione; Hawaii Institute of Geophysics and Planetology

P04.02 Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges

Session Chairs:
Raul Arenal, Universidad de Zaragoza, Spain; Kazu Suenaga, National Institute of Advanced Industrial Science and Technology, Japan

Platform Session
Tuesday 8:30 AM • Room: 16

8:30 AM 869 (Invited) Atom-by-Atom STEM Investigation of Defect Engineering in Graphene; QM Ramasse, DM Kepaptsoglou, FS Hage; SuperSTEM Laboratory, United Kingdom; T Susi, J Kotakoski, C Mangler, P Ayala, J Meyer; University of Vienna, Austria; JA Hinks, S Donnelly; University of Huddersfield, United Kingdom; R Zan, C-T Pan, SJ Haigh; University of Manchester, United Kingdom; U Bangert; University of Limerick, United Kingdom

9:00 AM 870 (Invited) M&M Student Awardee Direct Observation of Defects in Hexagonal Boron Nitride Monolayers; P Liu, L Liu, G Gu, G Duscher; University of Tennessee, Knoxville; J Guo; Oak Ridge National Laboratory; W Windl; Ohio State University

9:15 AM 871 Growing Carbon Nanotubes Within Boron Nitride Nanotubes; R Arenal; Universidad de Zaragoza, Spain; A Lopez-Bezanilla; Argonne National Laboratory

9:30 AM 872 M&M Student Awardee In-situ TEM Observation of Pt-terminating Carbyne on Graphene; E Kano; University of Tsukuba, Japan; A Hashimoto, M Takeguchi; National Institute for Materials Science, Japan

9:45 AM 873 Electron Microscopic Characterization of Functionalized Multi-Walled Carbon Nanotubes and Their Interactions with the Blood Brain Barrier; AE Goode, S Chen, M Motskin, DA Gonzalez Carter, DT Dexter, MSP Shaffer, MP Ryan, PD Haynes, AE Porter; Imperial College London; NDM Hine; University of Cambridge; SD Bergin; Trinity College Dublin; DW McComb; The Ohio State University
<table>
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<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Chair(s)</th>
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<tr>
<td>8:30</td>
<td>1004</td>
<td>(Invited) 10 Years of Surface-Enhanced Raman Spectroscopy in Art and Archaeology</td>
<td>M Leona, PS Londero; Metropolitan Museum of Art; JR Lombardi; City University of New York</td>
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<tr>
<td>9:00</td>
<td>1005</td>
<td>Interfaced SEM and micro-Raman Spectroscopy for SERS Analysis of Dyes on Single Fibers</td>
<td>SV Prikhodko; University of California, Los Angeles</td>
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<td>9:15</td>
<td>1006</td>
<td>(Invited) World War II Airplane Models Advise Long-Term Behavior of Injection Molded Cellulose Acetate Plastic: Visualizing Stress</td>
<td>O Madden, EK Webb, C Moore; Smithsonian Institution; M McGath; Johns Hopkins University</td>
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<td>9:45</td>
<td>1007</td>
<td>(Invited) Micro-XRF Analysis of High-Value Artifacts</td>
<td>AH Lee, T Nylese; EDAX Inc.</td>
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<tr>
<td>8:30</td>
<td>1024</td>
<td>(Invited) Simplified, High-Throughput TOF-SIMS Analysis via HR2 and Uniform Molecular Imaging of Rough Surfaces</td>
<td>GL Fisher; Physical Electronics</td>
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ADVANCES IN INSTRUMENTATION SYMPOSIA
TUESDAY MORNING

A01.03 Oliver Wells Memorial Symposium on the Scanning Electron Microscope

Session Chairs:
Lynne M. Gignac, IBM T. J. Watson Research Center;
David C. Joy, University of Tennessee;
Brendan J. Griffin, University of Western Australia

Platform Session
Tuesday 10:30 AM • Room: 24

10:30 AM 8 High Resolution Imaging in the Field Emission Scanning Electron Microscope at Low Accelerating Voltage and with Energy-Filtration of the Electron Signals; R Gauvin, N Brodusch, H Demers; McGill University, Canada; P Woo; Hitachi High-Technologies Canada Inc.


11:00 AM 10 Ultra Low Voltage Secondary and Backscatter Imaging in FE-SEM - Successes and Challenges; N Erdman, V Robertson, M Shibata; JEOL USA Inc.

11:15 AM 11 Discussion of Electron Induced Atomic Number Contrast; LA Giannuzzi; L.A. Giannuzzi & Associates LLC

A02.02 Advances in Imaging and Spectroscopy in STEM

Session Chairs:
Nigel D. Browning, Pacific Northwest National Laboratory;
Peter D. Nellist, University of Oxford, United Kingdom;
Maria Varela del Arco, Oak Ridge National Laboratory

Platform Session
Tuesday 10:30 AM • Room: 14

10:30 AM 29 (Invited) Progress in Applications of Quantitative STEM; J Hwang, J Zhang, S Stemmer; University of California, Santa Barbara

11:00 AM 30 Visualising the Three-dimensional Morphology and Surface Structure of Metallic Nanoparticles at Atomic Resolution by Automated HAADF STEM Atom Counting; L Jones, PD Nellist; University of Oxford, United Kingdom; VT Fauske, ATJ van Helvoort; Norwegian University of Science and Technology; KE MacArthur; University of Oxford, United Kingdom

11:15 AM 31 Recording and Using 4D-STEM Datasets in Materials Science; C Ophus, P Ercius, J Ciston; Lawrence Berkeley National Laboratory; M Sarahan, C Czarnik; Gatan Inc.

11:30 AM 32 (Invited) Atomic-Resolution Scanning Transmission Electron Microscopy with Segmented Annular All Field Detector; N Shibata, Y Ikuhara; University of Tokyo; S Findlay; Monash University, Australia

A04.03 Electron Holography at the Atomic Scale and the Nanoscale

Session Chairs:
D. Cooper, French Alternative Energies and Atomic Energy Commission;
D. Shindo, Tohoku University, Japan

Platform Session
Tuesday 10:30 AM • Marriott Ballroom B

10:30 AM 130 (Invited) New Approaches for Measuring Electrostatic Potentials and Charge Density Distributions in Working Devices Using Off-Axis and In-Line Electron Holography; RE Dunin-Borkowski; Forschungszentrum Jülich, Germany

11:00 AM 131 (Invited) A Newly Developed 1.2MV Field Emission Transmission Electron Microscope and Visualization of Topological Quantum Phenomena; N Osakabe; Hitachi High Technologies America, Ltd.

11:30 AM 132 Polarization-induced Charge Distributions at Polypeptide Interfaces in Semiconductor Nanostructures; L Li; Huazhong University of Science and Technology, China

11:45 AM 133 A New Design for Measuring Potentials in Operando Nanoelectronic Devices by Electron Holography; K He, J Cumings; University of Maryland
A07.03 Microscopy and Spectroscopy for Power Generation and Energy Storage
Session Chairs:
John Walmsley, SINTEF, Norway; Wolfgang Jäger, Christian-Albrechts-Universität zu Kiel, Germany

Platform Session
Tuesday 10:30 AM • Room: 15

10:30 AM 207 (Invited) Using (S)TEM Techniques to Study Energy related Materials at the Nanoscale; JC Walmsley, PE Vul- lum; SINTEF, Norway; R Holmestad; Norwegian University of Science and technology

11:00 AM 208 Morphology of Ruthenium Particles for Methanation Under Reactive Conditions; TW Hansen, F Masini, D Deiana, JH Nielsen, I Chorkendorff; Technical University of Denmark

11:15 AM 209 Fine Tuning Highly Active Pt3Ni7 Nanostructured Thin Films for Fuel Cell Cathodes; DA Cullen, KL More; Oak Ridge National Laboratory; M Lopez-Haro, P Bayle-Guillemaud; CEA-INAC Grenoble, France; L Guetaz; CEA-LITEN, France; M Debe, DF van der Vliet, AJ Steinbach; 3M Co.

11:30 AM 210 Cerium Reduction at the Interface Between Ceria and Yttria-Stabilised Zirconia and Implications for Interfacial Oxygen Non-stoichiometry; K Song; Shenyang National Laboratory for Materials Science, Chinese Academy of Sciences; H Schmid; INM-Leibniz Institute for New Materials, Germany; V Srot, PA van Aken; Max Planck Institute for Intelligent Systems, Germany; E Gilardi, G Gregori, J Maier; Max Planck Institute for Solid State Research, Germany; K Du; Shenyang National Laboratory for Materials Science, Chinese Academy of Sciences

11:45 AM 211 Studying Dynamics of Oxygen Vacancy Ordering in Epitaxial LaCoO3 / SrTiO3 Superlattice with Real-Time Observation; JH Jang, Q He, L Qiao, MD Biegalski, AR Lupini, SJ Pennycook, SV Kalinin, AJ Borisevich; Oak Ridge National Laboratory; Y-M Kim; Korea Basic Science Institute, South Korea; R Mishra, ST Pantelides; Vanderbilt University

A12.01 3D Imaging and Microanalysis: Image Analysis and Applications
Session Chairs:
Paul G. Kotula, Sandia National Laboratories; Keana Scott, National Institute of Standards and Technology

Platform Session
Tuesday 10:30 AM • Room: 17

10:30 AM 380 (Invited) Challenges and Opportunities in the Multivariate Analysis of 3D Spectral Images; MR Keenan; Unaffiliated

11:00 AM 381 Towards Quantitative 3D Chemical Analysis in TEM Using Quadrant XEDS Detector Geometry; A Genc, J Ringnalda, H Cheng, I Pullan, B Freitag; FEI Company; P Fischione; E.A. Fischione Instruments Inc.; Mu, C-M Wang, L Kovarik; Pacific Northwest National Laboratory

11:15 AM 382 M&M Student Awardee 3D ChemiSTEM™ Tomography of Nano-scale Precipitates in High Entropy Alloys; JM Sosa, DE Huber, B Welk, JK Jensen, REA Williams, S Lambert, HI. Fraser; The Ohio State University

11:30 AM 383 Towards Quantitative EDX Results in Three Dimensions; B Goris, D Zanaga, E Bladt, T Altantzis, S Bals; University of Antwerp; B Freitag, J Ringnalda; FEI Company

11:45 AM 384 Optimization of Experimental Parameters and Specimen Geometry for Pulsed-Laser Atom-Probe Tomography of Copper; RP Kolli; University of Maryland; F Meisenkothen; National Institute of Standards and Technology

A15.02 Cs-Correctors: Current State and Ongoing Developments
Session Chairs: Max Haider, CEOS GmbH, Germany; Rolf Erni, EMPA Switzerland

Platform Session
Tuesday 10:30 AM • Room: 22

10:30 AM 465 (Invited) Applications of Aberration Corrected TEM and Exit Wave Reconstruction in Materials Science; AI Kirkland; University of Oxford, United Kingdom

11:00 AM 466 (Invited) Off-Axial Aberration Correction Using a B-COR for Lorentz and HREM Modes; E Snoeck, F Houdellier, A Massebeuf, C Gatel, J Nicolai, M Hytch; CEMES-CNRS Université de Toulouse, France; Y Tani- guchi; Hitachi High-Technologies Corporation, Japan
A16.03 Correlative Microscopy and Microanalysis from Macro to Pico

Session Chairs:
Brian P. Gorman, Colorado School of Mines;
Christopher J. Gilpin, Purdue University;
Mor Baram, McMaster University, Canada

Platform Session
Tuesday 10:30 AM • Room: 21

10:30 AM 485 Correlative Microscopy Using TEM and SIMS: Parallel Ion Electron Spectrometry (PIES) for High-Resolution, High-Sensitivity Elemental Mapping for Applications in Materials Science and Biology; S Eswara Moorthy, D Dowsett, T Wirtz; Centre de Recherche Public - Gabriel Lippmann, Luxembourg

A16.03 Correlative Microscopy and Microanalysis from Macro to Pico

Session Chairs:
Brian P. Gorman, Colorado School of Mines;
Christopher J. Gilpin, Purdue University;
Mor Baram, McMaster University, Canada

Poster Session
Tuesday 10:30 AM • Room: 21

10:45 AM 486 The Atmospheric Scanning Electron Microscope (ASEM) Observes Axonal Segmentation and Synaptic Induction in Solution; C Sato, M Sato, T Ebihara; National Institute of Industrial Science and Technology, Japan; T Kinoshita, K Hiarno, S Nishihara; Soka University, Japan; T Uemura; Shinshu University School of Medicine, Japan; H Nishiyama, M Suga; JEOL Ltd., Japan

A17.03 Extended Crystal Defects: Quantification of Strain, Local Atomic Structure and Chemistry

Session Chairs:
Douglas L. Medlin, Sandia National Laboratories;
Jim Ciston, Lawrence Berkeley National Laboratory;
Yousuf N. Picard, Carnegie Mellon University

Platform Session
Tuesday 10:30 AM • Room: 12

10:30 AM 517 (Invited) Polar Oxide Interface Characterization by Differential Phase Contrast STEM; N Shibata, Y Ikuhara; University of Tokyo, Japan; SD Findlay; Monash University, Australia

11:00 AM 518 M&M Student Awardee Defect Analysis in La$_{0.7}$Sr$_{0.3}$MnO$_3$ Epitaxial Thin Films by Electron Channeling Contrast Imaging (ECCI); M Yan, M De Graef, YN Picard, PA Salvador; Carnegie Mellon University

11:15 AM 519 Toward 3D Mapping of Octahedral Rotations at Perovskite Thin Film Heterointerfaces Unit Cell by Unit Cell; Q He, R Ishikawa, AR Lupini, L Qiao, MD Biegalski, A Borisevich; Oak Ridge National Laboratory
Scientific Program

11:30 AM  **520 M&M Student Awardee Chemical and Defect Analysis in a ZrO2/LSMO Pillar-Matrix System**
D Zhou, W Sigle, Y Wang, M Kelsch, PA van Aken; Max Planck Institute for Intelligent Systems, Germany; Y Gao, H-U Habermeier; Max Planck Institute for Solid State Research, Germany

11:45 AM  **521 Atomic-Resolution Investigation of Irradiation-Induced Defects in Silicon Carbide**
CM Parish, Y Katoh, T Koyanagi; Oak Ridge National Laboratory; S Kondo; Kyoto University, Japan

**A18.03 Vendor Symposium: New Tools for Life and Materials Sciences**

Session Chairs:
Alice C. Dohnalkova, Pacific Northwest National Laboratory;
Elizabeth R. Wright, Emory University;
Mark A. Sanders, University of Minnesota

Platform Session
Tuesday 10:30 AM • Room: 25

10:30 AM  **558 Image Collection using an Auto Data Acquisition System and An Application to Ice Embedded Ribosome**
Y Aoyama; JEOL, Ltd., Japan

10:45 AM  **559 A New Microstructural Imaging Approach Through EBSD Pattern Region of Interest Analysis**
MM Nowell, SI Wright, T Rampton; EDAX Inc.; R de Kloe; EDAX B.V., Netherlands

11:00 AM  **560 Concepts for an Annular Pole Piece Detector for the Simultaneous Measurement of X-Rays and Backscattered Electrons Inside a SEM**
A Liebel, R Eckhardt, M Bornschlegl, A Bechteler, A Niculae, H Soltau; PNDetector GmbH, Germany

11:15 AM  **561 Performance Advances in LEAP Systems**
RM Ulfig, DJ Larson, TF Kelly, PH Clifton, TJ Prosa, DR Lenz, EX Oltman; CAMECA Instruments Inc.

11:30 AM  **562 The pnCCD for Applications in Transmission Electron Microscopy: Further Development and New Operation Modes**
R Henning, R Hartmann, M Huth, S Ihle, J Schmidt, L Strüder; PNSensor GmbH, Germany; M Simson, H Soltau; PNDetector GmbH, Germany

11:45 AM  **563 Large Solid Angle Silicon Drift Detectors for EDX Analysis in TEM**
A Niculae, M Bornschlegl, R Eckhardt, J Herrmann, G Krenz, A Liebel, H Soltau; PNDetector GmbH, Germany; G Lutz, L Strüder; PNSensor GmbH, Germany

**BIOLOGICAL SCIENCES SYMPOSIA TUESDAY MORNING**

**B01.02 Dr. Gerard Simon Memorial Symposium on Anatomic Pathology**

Session Chairs:
Sara E. Miller, Duke University;
Pierre-Mathieu Charest, Université Laval, Canada

Platform Session
Tuesday 10:30 AM • Room: 27

10:30 AM  **585 (Invited) Fifty Shades of Ultrastructural Pathology in One Thousand Sural Nerves**
JM Bilbao; University of Toronto, Canada

11:00 AM  **586 (Invited) Diagnostic Art: A Tribute to Professor Gérard Simon**
JA Tucker; University of South Alabama

11:30 AM  **587 (Invited) Electron Microscopy of Suspicious Samples and Infectious Specimens: Research and Diagnostics**
DR Beniac, TF Booth; National Microbiology Laboratory, Canada

**B06.03 Microanalysis of Biological Materials**

Session Chairs:
Peta L. Clode, University of Western Australia;
Richard D. Leapman, National Institutes of Health

Platform Session
Tuesday 10:30 AM • Room: 23

10:30 AM  **658 (Invited) Application of Analytical Electron Tomography to the Study of Pathogenic Protozoa**
K Miranda, W Girard-Dias, W De Souza; Federal University of Rio de Janeiro, Brazil

11:00 AM  **659 (Invited) Understanding Elemental Uptake in Plants Using High Resolution SIMS and Complementary Techniques**
KL Moore, CRM Grovenor; University of Oxford, United Kingdom; P Tosi, MJ Hawkesford, PR Shewry, F-J Zhao; Rothamsted Research, United Kingdom

11:30 AM  **660 Fast Mapping Of Biological Samples With Large Area EDS Detectors**
CL Collins, C McCarthy, N Rowlands, S Burgess; Oxford Instruments NanoAnalysis, United Kingdom

11:45 AM  **661 IUMAS-6 Early Career Scholar Otolith Biomineralisation: Insights From a Microstructural and Microanalytical Study**
AL McFadden, B Gillanders, B Wade; The University of Adelaide, Australia; A Pring; The South Australian Museum
Tuesday, August 5

PHYSICAL SCIENCES SYMPOSIA
TUESDAY MORNING

P02.03 Advances in In situ Microscopy
Session Chairs:
David A. Muller, Cornell University;
Haimei Zheng, Lawrence Berkeley National Laboratory;
Adam P. Hitchcock, McMaster University, Canada;
Thomas LaGrange, Lawrence Livermore National Laboratory

Platform Session
Tuesday 10:30 AM • Marriott Ballroom C

10:30 AM 763 Nanoscale Imaging of Lithium Ion Distribution During In situ Operation of a Battery Electrode and Electrolyte; ME Holtz, Y Yu, D Gunceler, J Gao, R Sundararaman, KA Schwarz, TA Arias, HD Abruna, DA Muller; Cornell University

11:00 AM 764 (Invited) Operando transmission X-ray microscopy studies on Li-ion batteries; JN Weker, JC Andrews, MF Toney; SLAC National Accelerator Laboratory; Y Cui, W Chueh; Stanford University

11:30 AM 765 In situ Transmission Electron Microscopy of the Electrochemical Intercalation of Graphite in Concentrated Sulfuric Acid; BC Regan, ER White, J Lodico, G Carlson, N Macro, WA Hubbard; University of California, Los Angeles

11:45 AM 766 Visualization of Active and Passive Control of Morphology during Electrodeposition; NM Schneider, JM Grogan, HH Bau; University of Pennsylvania; JH Park, S Kodambaka; University of California, Los Angeles; DA Steingart; Princeton University; FM Ross; IBM T. J. Watson Research Center

P03.03 Mineral Analyses from Laboratory to Spacecraft
Session Chairs:
Rhonda M. Stroud, U.S. Naval Research Laboratory;
Zack Gainsforth, University of California at Berkeley

Platform Session
Tuesday 10:30 AM • Room: 11

10:30 AM 843 (Invited) On the use of precession electron diffraction for minerals characterization: from twinning identification to structure refinement; D Jacob; CNRS,Université de Lille, France

11:00 AM 844 Towards Understanding the Processes Affecting the CR Chondrite Parent Body: Coordinated Electron Microscopy Study of the Matrices of Antarctic CR Chondrites; NM Abreu; Pennsylvania State University, DuBois

11:15 AM 845 (Invited) Maximizing Chemical and Textural Data with Minimal Sample Destruction: Computed Tomography, Wire Saws, and Electron Beams; ‘Oh, my!’, EJ Crapster-Pregont; Columbia University; DS Ebel; American Museum of Natural History

11:45 AM 846 A Synthesis of Instrumental Analytical Techniques for Examination of the Thermal History of Pallasite Meteorites; KL Crispin, A Shahar, V Hillgren, N Bennett; Carnegie Institution of Washington; S Mikhail; The University of Edinburgh, United Kingdom; N Fowler-Gerace; University of Toronto, Canada; R Ash, WF McDonough; University of Maryland

P04.03 Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges
Session Chairs:
Raul Arenal, Universidad de Zaragoza, Spain;
Kazu Suenaga, National Institute of Advanced Industrial Science and Technology, Japan

Platform Session
Tuesday 10:30 AM • Room: 16

10:30 AM 874 (Invited) Nanometric Resolved Cathodoluminescence on Few-Layer h-BN Flakes; A Zobelli, R Bourrellier, M Amato, S Meuret, LTH Tizei, A Gloter, K March, O Stephan, M Kociak; Université Paris-Sud; C Georgetti, L Reining; École Polytechnique Fédérale de Lausanne, Switzerland; MI Heggie; University of Surrey, United Kingdom

11:00 AM 875 Optical Spectroscopy Integrated with Environmental Scanning Transmission Electron Microscope: A Comprehensive in situ Characterization Platform; M Picher; University of Maryland; S Mazzucco, S Blankenship, G Holland, R Sharma; National Institute of Standards and Technology

11:15 AM 876 M&M Post-Doctoral Researcher Awardee Doping Properties and Phase Transition in Single-Layer MoS2; Y-C Lin, N Yoshihiko, K Suenga; National Institute of Advanced Industrial Science and Technology, Japan; DO Dumcenco, Y-S Huang; National Taiwan University of Science and Technology; H-P Komza, AV Krasheninnikov; University of Helsinki, Finland
Scientific Program

11:30 AM 877 M&M Student Awardee Structure and Optical Properties of Some Layered Two-Dimensional Transition-Metal Dichalcogenides: Molybdenum Disulfide, Molybdenum Diselenide, and Tungsten Diselenide; ES Reifler, NT Nuhfer, E Towe; Carnegie Mellon University

11:45 AM 878 Quantification of Dopant Distribution and the Local Band Gap in Selenium-Doped Molybdenum Disulfide; AR Lupini, W Zhu; Oak Ridge National Laboratory; Y Gong, Z Liu, J Lou, PM Ajayan; Rice University; J Lin, ST Pantelides; Vanderbilt University; SJ Pennycook; University of Tennessee

P08.03 Imaging and Analysis of Cultural Heritage Materials

Session Chairs:
Edward P. Vicenzi, Smithsonian Institution;
Marc Walton, Northwestern University;
Loïc Bertrand Synchrotron SOLEIL, France

Platform Session
Tuesday 10:30 AM • Room: 26

10:30 AM 1008 (Invited) Unusual Pigments Found in a Painting by Giotto (1266-1337) Reveal Diversity of Materials Used by Medieval Artists; BH Berrie; National Gallery of Art

11:00 AM 1009 Analysis of Molded and Coreformed Glass from 1st Millennium BC Gordion, Anatolia; KL Privat; University of New South Wales, Australia; WJ Reade; University of Sydney, Australia; JD Jones; Bucknell University

11:15 AM 1010 (Invited) Characterisation of 20th Century Metallic Paint in Works of Art; R Wuhrer, D Fania; University of Western Sydney, Australia; P Dredge, M Sawicki, L Allen; Art Gallery of New South Wales, Australia

11:45 AM 1011 A Non-Invasive Portable XRF System for Cultural Heritage Analyses; NC Barbi; PulseTor LLC; R Alberti, L Bombelli, T Frizzi; XGLab S.R.L., Italy

P09.02 Surface & Subsurface Microscopy & Microanalysis in Materials & Biological Systems

Session Chairs:
Vincent S. Smentkowski, General Electric;
John A. Chaney, The Aerospace Corporation;
Chanmin Su, Bruker-Nano, Inc.

Platform Session
Tuesday 10:30 AM • Marriott Ballroom D

10:30 AM 1027 Nanoscale Surface and Sub-Surface Chemical Analysis of SiGe Nanowires; W Hourani, E Martinez, J-M Fabbri; CEA-LETI Minatec, France; P Periwal, F Bassani, T Baron; CNRS, LTM; G Patriarche; Laboratoire de Photonique et de Nanostructures-CNRS, France

10:45 AM 1028 (Invited) AES and Related Techniques for Yield Improvement, Metrology and Development Support of ULSI Circuits Manufactured in ≤28nm CMOS Technology; K Dittmar, S Ohsiek, C Klein, M Weisheit, E Elke, R Binder, K Hempel, H-J Engelmann, J Metzger, M Lenski; DT Triyoso; Globalfoundries LLC, Germany

11:15 AM 1029 (Invited) Nanoscale Organic Defect Characterization with AFM-IR; C Marcott; Light Light Solutions, LLC; M Lo, Q Hu, K Kjoller, CB Prater; Anasys Instruments Corp.

11:30 AM 1030 (Invited) Multiplexed Biomimetic Lipid Membranes on Graphene by Dip-Pen Nanolithography; A Vijayaraghavan; The University of Manchester, United Kingdom
PHYSICAL SCIENCES TUTORIAL
TUESDAY MORNING

X41 Imaging of Magnetic Structures in Scanning and Conventional TEM
Session Chair: Patrick Phillips, University of Illinois at Chicago
Tutorial Session
Tuesday 10:30 AM • Room: 13

10:30 AM 1069 EMCD - Magnetic Chiral Dichroism in the Electron Microscope; P Schattschneider; Vienna University of Technology, Austria

MICROSCOPY EDUCATION • TUESDAY MORNING

X90.02 Microscopy in the Classroom
Session Chairs: Alyssa Calabro, Craig Queenan, and David Becker, Bergen County Academies, High School
Education Platform Session
Tuesday 10:30 AM • Marriott Ballroom E

10:30 AM 1075 Microscopy Society of America Certified Electron Microscopy Technician; PE Kysar; University of California, Davis; E Calomeni; Ohio State University

11:00 AM 1076 (Invited) Microscopy Education and Outreach Through Local Societies and Introductory Courses; TF Kosar; Harvard University
ADVANCES IN INSTRUMENTATION SYMPOSIA
TUESDAY AFTERNOON

A01.04 Oliver Wells Memorial Symposium on the Scanning Electron Microscope

Session Chairs:
Lynne M. Gignac, IBM T. J. Watson Research Center;
David C. Joy, University of Tennessee;
Brendan J. Griffin, University of Western Australia

Platform Session
Tuesday 1:30 PM • Room: 24

1:30 PM 12 SEM Through Dielectric Membranes: Secondary Electron Contrast Reversal; DN Leonard; Oak Ridge National Laboratory; D Gardiner, RL Thomas; Protochips, Inc.

1:45 PM 13 Spatial Resolution of Scanning Electron Microscopy Without a Vacuum Chamber; KXT Nguyen, J Richmond-Decker, M Holtz, DA Muller; Cornell University; Y Milstein; Bruker-Nano Ltd., Israel

2:00 PM 14 A Detector for Fast Electron Current Measurements based on Silicon Drift Detector Technology; A Liebel, U Weber, A Niculae, H Soltau; PNDetector GmbH, Germany; G Lutz; PNSensor GmbH, Germany

2:15 PM 15 IUMAS-6 Early Career Scholar Quantum Monte Carlo Simulation for Atomic Resolution SEM/STEM Image; Z Ruan, M Zhang, R Zeng, B Da, S Mao, Z Ding; University of Science and Technology of China; Y Ming; Anhui University, China

2:30 PM 16 A Novel Transmission Electron Imaging Technique for Observation of Whole Cells; Y Ominami, S Ito; Hitachi High-Technologies Corporation, Japan; M Nakajima, T Ushiki; Niigata University, Japan

A02.03 Advances in Imaging and Spectroscopy in STEM

Session Chairs:
Nigel D. Browning Pacific Northwest National Laboratory;
Peter D. Nellist University of Oxford, United Kingdom;
Maria Varela del Arco Oak Ridge National Laboratory

Platform Session
Tuesday 1:30 PM • Room: 14

1:30 PM 33 (Invited) Exploring Phonon Signals by High Energy / High Spatial Resolution EELS; OL Krivanek, N Delby, TC Lovejoy, NJ Bacon, GJ Corbin, P Hrncirik, ZS Szilagyi; Nion Co.; T Aoki, RW Carpenter, PA Crozier, J Zhu, P Rez; Arizona State University; RF Egerton; University of Alberta, Canada; PE Batson; Rutgers University

2:00 PM 34 Characterization of Electron Orbital Angular Momentum Transfer to Nanoparticle Plasmon Modes; TR Harvey, J Chess, JS Pierce, BJ McMorran; University of Oregon; PErcius; Lawrence Berkeley National Laboratory

2:15 PM 35 High Energy and Spatial Resolution EELS Band Gap Measurements Using a Nion Monochromated Cold Field Emission HERMES Dedicated STEM; RW Carpenter; Arizona State University

2:30 PM 36 (Invited) Challenges and Opportunities in Materials Science with Next Generation Monochromated EELS; PA Crozier; Arizona State University

A07.04 Microscopy and Spectroscopy for Power Generation and Energy Storage

Session Chairs:
Haimei Zheng, Lawrence Berkeley National Laboratory;
Feng Wang, Brookhaven National Laboratory

Platform Session
Tuesday 1:30 PM • Room: 15

1:30 PM 212 (Invited) In situ Electrochemical Liquid Cell TEM Visualization of Electrode-Electrolyte Interfaces; H Zheng; Lawrence Berkeley National Laboratory

2:00 PM 213 Multimode STEM Imaging and Tomography of Radial Heterostructure Nanowire Li-Ion Mini-Batteries; VP Oleshko, T Lam, D Ruzmetov, AV Davydov, S Krylyuk, P Haney, H Lezec; National Institute of Standards and Technology; J Cumings; University of Maryland; AA Talin; Sandia National Laboratories
2:15 PM  214 Direct Atomic-Scale Imaging of Multistep Phase Transition During the Lithiation of Nanowires by In-Situ (S)TEM; A Nie, R Shahbazian-Yassar; Michigan Technological University; R Klie; University of Illinois, Chicago; S Vaddiraju; Texas A&M University, College Station

2:30 PM  215 Probing the Local Chemical and Structural Ordering of Iron Oxyfluoride, a Promising Electrode Material for Li-Ion Battery; D Su, S-W Kim, K He, J Graetz, F Wang; Brookhaven National Laboratory; N Pereira, GG Amatucci; Rutgers University

2:45 PM  216 Spatially Resolved Characterization of Phases in LiFePO4 Battery Cathodes Using Low Loss Electron Energy-loss Spectroscopy; SA Channagiri, RM Nichol, BG Vishwanathan, DJ McComb; The Ohio State University; SC Nagpure; Oak Ridge National Laboratory

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A12.02 3D Imaging and Microanalysis: Image Analysis and Applications

Session Chairs:
Paul G. Kotula, Sandia National Laboratories;
Keana Scott, National Institute of Standards and Technology

Platform Session
Tuesday 1:30 PM • Room: 17

1:30 PM  385 (Invited) Data Processing Challenges for Proper Interpretation of FIB-SEM Nanotomography Imaging Applications; MP Marsh; Marsh Imaging and Visualization; KCK Scott; National Institute of Standards and Technology; RM Stroud, ND Bassim; U.S. Naval Research Laboratory

2:00 PM  386 Optimization of Focused Ion Beam-Tomography for Superconducting Electronics; A Sanders, A Fox, P Dresselhaus, A Curtin; National Institute of Standards and Technology 2:15 PM  387 (Invited) Accelerating Discovery in 3D Microanalysis: Leveraging Open Source Software and Deskside High Performance Computing; TS Yoo, BC Loweckamp, O Kuybeda, MJ Ackerman, K Narayan, GA Frank, A Bartesaghi, M Borgnia, S Subramaniam; National Institutes of Health; G Sapiro; Duke University

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A15.03 Cs-Correctors: Current State and Ongoing Developments

Session Chairs:
Max Haider, CEOS GmbH, Germany;
Rolf Erni, EMPA Switzerland

Platform Session
Tuesday 1:30 PM • Room: 22

1:30 PM  469 Aberration-Corrected Transmission Electron Microscopy Reveals Nanoscale Disorder in Bismuth Ferrite Single Crystals; KW Urban, LL Jin; Peter Grünberg Institute & Ernst Ruska Research Center Jülich, Germany; CL Jia, SL Mi; Xi'an Jiaotong University, China; MM Alexe; University of Warwick, United Kingdom; DM Hesse; Max-Planck-Institut für Mikrostrukturphysik, Germany

2:00 PM  470 Atomically Resolved 3D Shape Determination of a MgO Crystal Using a Single Aberration Corrected HRTEM Image; C-L Jia, S-B Mi, D Wang; Xi'an Jiaotong University; J Barthel; RWTH Aachen University; RE Dunin-Borkowski, KW Urban, A Thust; Forschungszentrum Jülich GmbH, Germany

2:30 PM  471 Amplitude Contrast Imaging: High Resolution Electron Microscopy Using a Spherical and Chromatic Aberration Corrected TEM; JG Wen, DJ Miller, RE Cook, NJ Zaluzec; Argonne National Laboratory

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A17.04 Extended Crystal Defects: Quantification of Strain, Local Atomic Structure and Chemistry

Session Chairs:
Douglas L. Medlin, Sandia National Laboratories;
Jim Ciston Lawrence, Berkeley National Laboratory;
Yoosuf N. Picard, Carnegie Mellon University

Platform Session
Tuesday 1:30 PM • Room: 12

1:30 PM  522 (Invited) Local Strain Measurements at Dislocations, Disclinations and Domain Boundaries; MJ Hych, T Denneulin, N Cherkashin, E Snoeck, C Gatel, L Durand; CEMES-CNRS Université de Toulouse, France; A Lubk; Technische Universität Dresden, Germany

2:00 PM  523 Nano-scale Strain Mapping Using Advanced STEM with a Direct Electron Detector; B Ozdol, C Gammer, A Minor; Lawrence Berkeley National Laboratory; M Sarathan; Gatan Inc.
2:15 PM 524 Measuring Strain Fields surrounding Grain-Boundary Dislocations in Silicon using Scanning Transmission Electron Microscopy; M Couillard; National Research Council Canada

2:30 PM 525 Direct Lattice Parameter Measurements Using HAADF-STEM; AA Oni, X Sang, JM LeBeau; North Carolina State University; A Kumar, SB Sinnott; University of Florida; SV Raju, SK Saxena; Florida International University; S Srinivasan, K Rajan; Iowa State University

2:45 PM 526 Quantitative Strain Measurement in Semiconductor Devices by Scanning Moiré Fringe Imaging; S Kim, S Lee, Y Jung, JJ Kim, G Byun, S Lee, H Lee; Samsung Electronics, Republic of Korea

BIOLOGICAL SCIENCES SYMPOSIA TUESDAY AFTERNOON

B03.01 Nuclear Architecture and Chromatin Structure: 40 Years after the Nucleosome

Session Chairs:
Ada L. Olins, University of New England;
Donald E. Olins, University of New England

Platform Session
Tuesday 1:30 PM • Room: 27

1:30 PM 599 (Invited) Protein Interaction and Transport Maps of Live Cell Nuclei Using Fluorescence Correlation Spectroscopy in a Single Plane Illumination Microscope; JW Krieg er, A Pernus, J Langowski; German Cancer Research Center; P Brazda; University of Debrecen, Hungary

2:00 PM 600 (Invited) Heterochromatin Domains: Uncoupling Epigenetic Modifications and Chromatin Structural Parameters; E Fussner; Lunenfeld Tanenbaum Institute, Canada; M Strauss; Harvard Medical School; R Li, Z Baghestani, DP Bazett-Jones; Hospital for Sick Children, Toronto, Canada

2:30 PM 601 (Invited) Large-scale Chromatin Structure and Dynamics: a Combined Structural and Molecular Approach; X Deng, G Sustackova, Y Chen, N Khanna, AS Belmont; University of Illinois, Urbana-Champaign

B05.01 Structural Biology and Ultrastructure

Session Chairs:
Michael Radermacher, University of Vermont;
Paula da Fonseca, MRC Laboratory of Molecular Biology, United Kingdom;
Ingeborg Schmidt-Krey, Georgia Institute of Technology;
Caroline Miller, Indiana University

Platform Session
Tuesday 1:30 PM • Room: 21

1:30 PM 621 (Invited) Towards a General Protocol to Form Single-Layered 2D Crystal Sheets of Membrane Proteins for Electron Crystallography; MC Johnson; Florida State University; I Schmidt-Krey; Georgia Institute of Technology

2:00 PM 622 Solving Protein Nanocrystals by Cryo-EM: Multiple Scattering Artifacts; G Subramanian, S Basu, H Liu, J Spence; Arizona State University; J-M Zuo; University of Illinois

2:15 PM 623 MSA Robert P. Apkarian Memorial Scholarship (Biological Sciences) Phage Capsid-like Structure of Myxococcus xanthus En capsulin, a Protein Shell That Stores Iron; J Fontana, D Nemecek, AA Aksyuk, N Cheng, DC Winkler, JB Heymann, AC Steven; National Institute of Arthritis and Musculoskeletal and Skin Diseases; CA McHugh, E Hoiczyk; Johns Hopkins University

2:30 PM 624 (Invited) Deciphering the 3D Structure and Function of Phosphofructokinase from Fission Yeast; S Benjamin, M Radermacher, T Ruiz; University of Vermont

B07.01 Light Sheet and Multi Photon Imaging

Session Chairs:
Peter Santi, University of Minnesota;
Thomas Stroh, McGill University, Canada

Platform Session
Tuesday 1:30 PM • Room: 23

1:30 PM 672 (Invited) Using Two-Photon Intravital Imaging to Study Developmental Plasticity of Neural Circuits; ES Ruthazer; McGill University, Canada

2:00 PM 675 Cryo-imaging of Inflated Frozen Human Lung Sections at -60OC using Multiphoton and Harmonic Generation Microscopy; T Abraham; The Pennsylvania State University; J Hogg; The James Hogg Research Centre, Canada
Scientific Program

2:30 PM 673 Thrombus Formation Processes are Dependent on Endothelial Injuries: Examined by In vivo Two-photon Molecular Imaging and Laser Manipulation; S Nishimura; Jichi Medical University, University of Tokyo, Japan

PHYSICAL SCIENCES SYMPOSIA
TUESDAY AFTERNOON

P02.04 Advances in In situ Microscopy

Session Chairs:
David A. Muller, Cornell University;
Haimei Zheng, Lawrence Berkeley National Laboratory;
Adam P. Hitchcock, McMaster University, Canada;
Thomas LaGrange, Lawrence Livermore National Laboratory

Platform Session
Tuesday 1:30 PM • Marriott Ballroom C

1:30 PM 767 In situ Methods for Analysis of Polymer Electrolyte Membrane Fuel Cell Materials by Soft X-Ray Scanning Transmission X-Ray Microscopy; AP Hitchcock, V Lee; McMaster University, Canada; V Berejnov, D Susac, J Stumper; Automotive Fuel Cell Cooperation Corporation, Canada

2:00 PM 768 M&M Post-Doctoral Researcher Awardee In situ Transmission Electron Microscopy (TEM) Study on the Lithium Ion Transport in Si-Ge Heterostructured Nanowires; Y Liu, XH Liu; Sandia National Laboratories, Albuquerque; B-M Nguyen, J Yoo, ST Picraux; Los Alamos National Laboratory; J Sullivan; Sandia National Laboratories, Livermore; S Dayeh; University of California, San Diego

2:15 PM 769 In situ TEM Study of Internal and External Stress on Lithiation Behavior of High Capacity Anode Materials with a Large Volume Change; C Wang, M Gu, DE Perea; Pacific Northwest National Laboratory; H Yang, S Zhang; Pennsylvania State University

2:30 PM 770 M&M Post-Doctoral Researcher Awardee In Operando Transmission Electron Microscopy Imaging of SEI Formation and Structure in Li-ion and Li-metal batteries; RL Sacci, NJ Dudney, KL More, RR Unocic; Oak Ridge National Laboratory

2:45 PM 771 Corrosion of Metal Films Observed Using In situ and Ex Situ Electron Microscopy; SW Chee, D Duquette, R Hull; Rensselaer Polytechnic Institute; FM Ross; IBM T. J. Watson Research Center

P03.04 Mineral Analyses from Laboratory to Spacecraft

Session Chairs:
Rhonda M. Stroud, U.S. Naval Research Laboratory;
Zack Gainsforth, University of California at Berkeley

Platform Session
Tuesday 1:30 PM • Room: 11

1:30 PM 847 (Invited) Coordinated Microanalyses of Seven Particles of Probable Interstellar Origin from the Stardust Mission; A Westphal, AL Butterworth, Z Gainsforth; University of California, Berkeley; RM Stroud; U.S. Naval Research Laboratory; HA Bechtel; Lawrence Berkeley Laboratory; F Brenker, S Schmitz; Goethe University Frankfurt; GJ Flynn; State University of New York, Plattsburgh; DR Frank; NASA JSC; JK Hillier, F Postberg, M Trieloff; University of Heidelberg; AA Simionovic; Univers de Grenoble; VJ Sterken, R Srama; University of Stuttgart; C Allen; NASA JSC; D Anderson, R Lettieri, W Marchant, J Stodolna, J Von Korff, D Zevin; University of California, Berkeley; A Ansari; Columbia University; S Bajt; DESY; RK Bastien; NASA JSC; N Bassim; U.S. Naval Research Laboratory; J Bridges; University of Leicester; DE Brownlee; University of Washington; M Burchell, MC Price; University of Kent; M Burghammer, P Cloetens, J-A Sans Tresseras; University of New Mexico; AM Davis, A King, T Stephans; University of Chicago; R Doll, C Floss, A Leonard, WJ Ong, K Schreiber, F Stadernmann; Washington University; E Grün; Max-Planck-Institut für Kernphysik; PR Heck; Field Museum of Natural History; P Hoppe, J Huth, J Leitner; Max-Planck-Institut für Chemie; B Hudson; Midland, ON, Canada; A Kearsley; Natural History Museum; B Lai, S Sutton; Argonne National Laboratory; L Lemelle; Ecole Normale Superiéure de Lyon; H Leroux; University of Lille; LR Nittler; Carnegie Institution of Washington; R Ogliore; University of Hawaii at Manoa; SA Sandford; NASA ARC; T Schoonjans, G Silversmit, B Vekemans, L Vincze; University of Ghent; P Tsou; NASA JPL; A Tsuchiyama; Osaka University; T Tyliszczak; Lawrence Berkeley National Laboratory; N Wordsworth; Stoke Poges, Bucks, UK; ME Zolensky; NASA JSC
2:00 PM  848  Coordinated Electron and X-ray Microscopy of Cometary Organic Matter Collected by the NASA Stardust Mission; BT De Gregorio; Nova Research Inc.; RM Stroud; U.S. Naval Research Laboratory; LR Nittler, GD Cody; Carnegie Institution of Washington; D Kilcoyne; Advanced Light Source

2:15 PM  849 (Invited)  IUMAS-6 Early Career Scholar  Morphologies, Isotopes, Crystal Structures, and Microstructures of Presolar Al2O3 Grains: a NanoSIMS, EBSD, EDS, CL, and FIB-TEM study; A Takigawa; Kyoto University; RM Stroud; U.S. Naval Research Laboratory; LR Nittler, CMO’D Alexander; Carnegie Institution of Washington; EP Vicenzi; Smithsonian Institution; SA Wight; National Institute of Standards and Technology

2:45 PM  850  Determination of the Effects of Hydrothermal Alteration on Silicate Stardust with Secondary Ion Mass Spectrometry and Transmission Electron Microscopy; RM Stroud; U.S. Naval Research Laboratory; BT De Gregorio; Nova Research; J Davidson, LR Nittler, CMO’D Alexander; Carnegie Institution of Washington

P04.04 Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges

Session Chairs:
Raul Arenal, Universidad de Zaragoza, Spain; Kazu Suenaga, National Institute of Advanced Industrial Science and Technology, Japan

Platform Session
Tuesday 1:30 PM • Room: 16

1:30 PM  879 (Invited)  Inorganic Two-Dimensional Materials Under Electron Irradiation: Stability, Evolution of the Atomic Structure, and Beam-Mediated Doping; AV Krasheninnikov; Aalto University, Finland

2:00 PM  880  Atomic Resolution Single Walled Carbon Nanotube Nucleation Steps on Faceted Catalyst Particle Reveal Potential for Chirality Control; PA Lin, M Picher; National Institute of Standards and Technology; JL Gomez Ballesteros, PB Balbuena; Texas A&M University; R Sharma; National Institute of Standards and Technology

2:15 PM  881  Flexible Metallic Nanowires with Self-Adaptive Contacts to Semiconducting Transition-Metal Dichalcogenide Monolayers; J Lin, D Prasai, KI Bolotin, D Caudel, ST Pantelides; Vanderbilt University; O Cretu, K Suenaga, MT Cuong, M Otani; National Institute of Advanced Industrial Science and Technology, Japan; W Zhou, AR Lupini, JG Idrobo, NJ Ghimire; Oak Ridge National Laboratory; S Okada; University of Tsukuba, Japan; A Burger; Fisk University; J Yan, DG Mandrus, SJ Pennycook; University of Tennessee

2:30 PM  882  Failure Analysis and Reliability of Low-Temperature-Grown Multi-Wall Carbon Nanotube Bundles Integrated as Vias in Monolithic Three-Dimensional Integrated Circuits; AN Chiaramonti, AW Sanders, DT Read; National Institute of Standards and Technology; S Vollebregt, R Ishihara; Delft University of Technology, Netherlands

2:45 PM  883  New Microscopy - Imaging of Quantum Materials; DC Bell, RM Westervelt, E Kalfon-Cohen; Harvard University

P07.01 Microscopy and Characterization of Ceramics, Polymers, and Composites

Session Chairs:
S.K. Sundaram, Alfred University; James E. Martinez, NASA Johnson Space Center

Platform Session
Tuesday 1:30 PM • Marriott Ballroom A

1:30 PM  945 (Invited)  Visualizing Phase Transition Induced Actuation in Vanadium Dioxide in a Transmission Electron Microscope; S Ramanathan; Harvard University

2:00 PM  946  A Multi-Step Transmission Electron Microscopy Sample Preparation Technique for Indented Ceramics having Extensive Sub-Surface Cracking; CV Weiss Brennan, JJ Swab; U.S. Army Research Laboratory; SD Walck; Bowhead Science & Technology
Scientific Program

2:30 PM 947 Effect of Nitrogen Content on the Microstructure and Hardness of Hard Zr–B–C–N Films; M Zhang, J Jiang, EI Meletis; University of Texas at Arlington; J Vlček, P Steidl, J Kohout, R Cerstvy; University of West Bohemia, Czech Republic

2:45 PM 948 M&M Student Awardee Nanocharacterization and Electrical Properties of Grain Boundaries in Gd/Pr Doubly-Doped Ceria; WJ Bowman, J Zhu, PA Crozier; Arizona State University

P08.04 Imaging and Analysis of Cultural Heritage Materials
Session Chairs: Edward P. Vicenzi, Smithsonian Institution; Marc Walton, Northwestern University; Loïc Bertrand, Synchrotron SOLEIL, France

Platform Session Tuesday 1:30 PM • Room: 26

1:30 PM 1012 (Invited) A New Synchrotron Approach to Study Ancient Materials: UV/visible Photoluminescence Micro-Imaging; M Thoury, L Bertrand, M Réfrégiers; Synchrotron SOLEIL, France

2:00 PM 1013 Multiple Layers in Black Gloss as Evidence of Multiple Firings; I Cianchetta, K Trentelman; Getty Conservation Institute; MS Walton; Northwestern University; A Mehta; SLAC National Accelerator Laboratory; B Foran; The Aerospace Corporation

2:15 PM 1014 (Invited) Decomposing Apricots: Tracking Transformation of Arsenic Sulphide pigments in a Dutch Golden Age Still-life; K Keune, A van Loon; University of Amsterdam; J Mass; Winterthur Museum; F Meier; Utrecht University, Netherlands; C Pottash; Royal Picture Gallery, Mauritshuis; A Hull; University of Delaware; A Mehta; Stanford Synchrotron radiation Lightsource

2:45 PM 1015 Micro XRF Imaging of Daguerreotypes; J Davis; National Institute of Standards and Technology; C Hilton; Brown University; EP Vicenzi; Smithsonian Institution

P09.03 Surface & Subsurface Microscopy & Microanalysis in Materials & Biological Systems

Platform Session Tuesday 1:30 PM • Marriott Ballroom D

1:30 PM 1031 (Invited) Complimentary XPS and AES Analysis of MoS3 Solid Lubricant Coatings; SS Alnabulsi, DF Paul, JF Moulder, JS Hammond; Physical Electronics; JR Lince; The Aerospace Corporation

2:00 PM 1032 (Invited) Chemical Characterization of Material Surfaces Using X-ray Photoelectron Spectroscopy (XPS): The Perfect Complement to Electron Microscopy Techniques; BR Strohmeier, RG White, T Nunney, P Mack, AE Wright; Thermo Fisher Scientific

2:30 PM 1033 SEM, TEM, and AFM Analyses of Phase-Separated Polymer Blend Membranes for Gas Separations; NP Papanitiya, DK Bushdiecker II, MP Tomasek, CK Miller, KJ Balkus, Jr., JP Ferraris; The University of Texas, Dallas; CJ Gilpin; Purdue University

2:45 PM 1034 Integrating 3D Surface Imaging with FIB/SEM Microscopy; B Volbert, G Renka, K Schock, S Kleindiek; Kleindiek Nanotechnik GmbH, Germany; A Lieb; Nanosurf; M Dadras; Centre Suisse d’Électronique et de Microtechnique

Project MICRO Workshop
Session Chairs: Elaine Humphrey, University of British Columbia; Stuart McKernan, 3M

Education Session Tuesday 1:30 PM • Marriott Ballroom E
Scientific Program

MICROSCOPY EDUCATION • TUESDAY AFTERNOON

X90.P1 Education
Poster Session
Tuesday 3:30 PM Exhibit Hall AB

3:30 PM 1077 Microscopy: "Swiss Army Knife" of Science; CA Wisner, DR Sutton; Missouri University of Science and Technology; Poster # 120

3:30 PM 1078 Middle School Classroom Materials—Structure and Failure of Wood: A Computational and Micrographic Examination; D Shattuck; Concord Middle School, Massachusetts; Poster # 121

3:30 PM 1079 Teaching with the Microscopy Society of America's Sandbox; CA Zona, C Gorman, WF Zawadowski; Hooke College of Applied Sciences; HM Ullberg, BL Dean; Mccrone Associates; Poster # 122

ADVANCES IN INSTRUMENTATION SYMPOSIA TUESDAY AFTERNOON

A02.P1 Advances in Imaging and Spectroscopy in STEM
Poster Session
Tuesday 3:30 PM Exhibit Hall AB

3:30 PM 59 Application of the Projective Standard Deviation to STEM Imaging and Analysis; ED Grimestone, X Sang, JM LeBeau; North Carolina State University; Poster # 124

3:30 PM 60 Precision Limits to STEM Imaging from Dynamic Scattering and Channeling of Sub-Angstrom Electron Probes; AB Yankovich, PM Voyles; University of Wisconsin, Madison; Poster # 125

3:30 PM 61 Dynamics of Electron Beam Channeling in a Single Atomic Column and in Crystals; A Mittal, M Odlyzko, KA MKhoyan; University of Minnesota; Poster # 126

3:30 PM 62 Resolving 45 pm with 300 kV Aberration Corrected STEM; H Sawada, N Shimura, K Satoh, E Okunishi, F Hosokawa; JEO Ltd., Japan; N Shibata, Y Ikuhara; The University of Tokyo, Japan; Poster # 127

3:30 PM 63 Getting the Best from an Imperfect Detector – an Alternative Normalisation Procedure for Quantitative HAADF STEM; L Jones, PD Nellist; University of Oxford, United Kingdom; GT Martinez, A Bech, S VanAert; University of Antwerp, Belgium; Poster # 128

3:30 PM 64 Simultaneous High-Speed DualEELS and EDS Acquisition at Atomic Level; P Longo, A Aitouchen, PJ Thomas, RD Tweiten; Gatan Inc.; T Topuria, P Rice; IBM; Poster # 129

3:30 PM 65 Improving the Spatial Resolution of Atomic-Scale EDS Mapping for Chemical Imaging and Quantification of Metallic Alloy Structures; P Lu, E Romero; Sandia National Laboratories, Albuquerque; L Zhou, MJ Kramer; Ames Laboratory; DJ Smith; Arizona State University; Poster # 130

3:30 PM 66 Anti-site Defects in Perovskite YAlO₃:Ce Using Aberration-corrected STEM; M Koschan, M Zhuravleva, CL Melcher, G Duscher; University of Tennessee, Knoxville; MF Chisholm; Oak Ridge National Laboratory; T Kishida; Asahi Kasai Corporation, Japan; Poster # 131

3:30 PM 67 Removal of FEG Fluctuations in STEM Imaging; SWang; Micron Technology, Inc.; Poster # 132

3:30 PM 68 Interfacial Atomic Number Contrast in Thick Samples; ADutta, H Heinrich; University of Central Florida; Poster # 133
Scientific Program

3:30 PM  **69 M&M Student Awardee** Study of the Ultrathin Ferroelectric BaTiO$_3$ Film using Scanning Transmission Electron Microscopy; D Park, J Mayer; RWTH Aachen; A Herpers, T Menke, R Dittmann; Forschungszentrum Jülich, GmbH, Germany

**Poster # 134**

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**A07.P2 Microscopy and Spectroscopy for Power Generation and Energy Storage**

**Poster Session**
Tuesday 3:30 PM Exhibit Hall AB

3:30 PM  **243** An advanced quantitative analysis of Li in LIB with AES Preparation for a clean cross section with the Cross Section Polisher; A Tanaka, K Tsutsumi, H Onodera, T Tazawa; JEOL Ltd., Japan

**Poster # 135**

3:30 PM  **244** Quantitative oxidation state analysis of transition metals in a lithium-ion battery with high energy resolution AES; A Tanaka, K Tsutsumi, H Onodera, T Tazawa; JEOL Ltd., Japan

**Poster # 136**

3:30 PM  **245 M&M Post-Doctoral Researcher Awardee** Discovering a Novel Sodiation in FeF$_2$ Electrodes for Sodium-Ion Batteries; K He, P Gao, Y Zhu, F Wang, D Su; Brookhaven National Laboratory; N Pereira, GG Amatucci; Rutgers University

**Poster # 137**

3:30 PM  **246** Transmission Electron Forward Scattered Diffraction and Low Voltage SEM/STEM Characterization of Binder-Free TiO$_2$ Electrodes; MJ Sussman, N Brodusch, R Gauvin, GP Demopoulous; McGill University, Canada

**Poster # 138**

3:30 PM  **247** Imaging and Spectroscopy of Pristine and Cycled Li,MnO$_2$; PJ Phillips, RF Klie; University of Illinois at Chicago; H Iddir, R Benedek, DP Abraham; Argonne National Laboratory

**Poster # 139**

3:30 PM  **248** In situ TEM Study on Electrochemical Behavior of α-MnO$_2$ Nanowire; Y Yuan, A Nie, RS Yassar; Michigan Technological University; S Santhanagopalan, DD Meng; University of Texas, Arlington

**Poster # 140**

3:30 PM  **249** Characterization of a Layered Lithium Manganese-rich Oxide Cathode Material via Scanning Transmission Electron Microscopy; AC Johnston-Peck, LA Bendersky, AA Herzing; National Institute of Standards and Technology - Withdrawn

**Poster # 141**

3:30 PM  **250** Microstructural and Microchemical Analyses of Extracted Second-Phase Precipitates in Alpha-Annealed and Beta-Quenched Zircaloy-4; KR Anderson, R Bajaj; Bechtel Marine Propulsion Corp.

**Poster # 142**

3:30 PM  **251** Probing the Reaction Mechanism for Highly Reactive Nanothermite Formulations; RJ Jacob, W-A Chiu, MR Zachariah; University of Maryland, College Park

**Poster # 143**

3:30 PM  **252 M&M Student Awardee** Tomography and Spectroscopy of Structure and Degradation in Carbon Electrode Materials for Energy Conversion and Storage; E Padgett, ME Holtz, DA Muller; Cornell University

**Poster # 144**

3:30 PM  **253** Understanding the role of potassium doping in PbTe-PbS thermoelectrics; H Wu, F Zheng; South University of Science and Technology of China; L Zhao; Northwestern University; D Wu, X Tong, J He; South University of Science and Technology of China; Y Pei; BeiHang University, China

**Poster # 145**

3:30 PM  **254** ZnO Nanowire Supported Ag Catalyst for Methanol Steam Reforming; J Liu, J Xu, J Liu; Arizona State University; Y Huang; Harbin Institute of Technology

**Poster # 146**

3:30 PM  **255** Characterization of Aluminum and Nickel Thermochemical Diffusion for Synthesis of Alkaline Water Electrolysis Electrodes; H Alimadadi, C Kjartansdóttir, T Kasama, P Möller; Technical University of Denmark

**Poster # 147**

3:30 PM  **256** In Situ TEM Electrochemical Processes in Conversion-Based Li-Ion Battery Electrodes; K Kariki, F Wang; Brookhaven National Laboratory; GG Amatucci; Rutgers University; MS Whittingham; University of New York at Binghamton

**Poster # 148**
Scientific Program

A12.P1 3D Imaging and Microanalysis: Image Analysis and Applications

Poster Session
Tuesday 3:30 PM Exhibit Hall AB

3:30 PM 399 3D EDS Applications Using Destructive and Non-Destructive FIB-Based Techniques; J Wittenzellner, N Magdefrau, D Goberman; United Technologies Research Center; R McLaughlin, S Bhattachrula; Oxford Instruments America, Inc

Poster # 149

3:30 PM 400 Time-Resolved 3D Imaging of Ion Beam Induced Surface Damage in Gold Nanoparticles; D Bufford, SH Pratt, TJ Boyle, K Hattar; Sandia National Laboratories

Poster # 150

3:30 PM 401 M&M Student Awardee Model-Based Iterative Reconstruction for Low-Dose Electron Tomography; SV Venkatakrishnan, CA Bouman; Purdue University; M-S Hsiao, N Garvin, J Simmons, LF Drummy; U.S. Air Force Research Laboratory; MA Jackson; BlueQuartz Software LLC; M De Graef; Carnegie Mellon University

Poster # 151

3:30 PM 402 M&M Student Awardee Atomic Resolution Tomography of Magnetically Anisotropic FePt Nanoparticles; M Scott, C-C Chen, J Miao; University of California, Los Angeles; H Zeng; University at Buffalo; P Ercius; National Center for Electron Microscopy

Poster # 152

3:30 PM 403 Electron Diffraction-Based Tilt Angle Measurements in Electron Tomograph; M Hayashida; National Institute of Advanced Industrial Science and Technology, Japan; M Malac, M Bergen, R Egerton; National Institute of Nanotechnology, Canada

Poster # 153

3:30 PM 404 M&M Student Awardee A Model Based Method for Tomographic Reconstructions of Nanoparticle Assemblies; JC Li; SUNY Stony Brook; D Su, HL Xin; Brookhaven National Laboratory

Poster # 154

3:30 PM 405 Energy-Filtered Transmission Electron Microscope Tomography of Silicon Nanoparticles in Silicon Dioxide Deposited with High Density Plasma Chemical Vapor Deposition; TH Brintlinger, ME Twigg, HL Hughes; U.S. Naval Research Laboratory

Poster # 155

3:30 PM 406 Data Intensive Imaging for 3D Atom Probe; S Broderick, S Padalker, S Dumpala, K Rajan; Iowa State University

Poster # 156

3:30 PM 407 Compositional Analysis of As-Cast and Crystallized \( Pd_{66}Cu_{25}Ni_{10}P_{5} \) Bulk Metallic Glass; DL Jaeger, S Mridha, D Choudhuri, S Mukherjee, R Banerjee; University of North Texas

Poster # 157

3:30 PM 408 M&M Student Awardee Multi-scale 3D Mapping of Tomography Data; D Jha, HO Sørensen, D Mütter, SL Svane Stipp; University of Copenhagen, Denmark

Poster # 158

3:30 PM 409 X-Ray Tomography and Finite Elements Simulations of Rock Mechanics; D Mütter, HO Sørensen, D Jha, KN Dalby, SLS Stipp; University of Copenhagen, Denmark

Poster # 159

3:30 PM 410 Fusing Multi-Scale and Multi-Modal 3D Imaging and Characterization; AP Merkle, L Lavery, J Gelb; Carl Zeiss X-ray Microscopy, Inc.; N Piche; Object Research Systems, Canada

Poster # 160

3:30 PM 411 Tracing Tubular Objects in 3D Confocal Images Using Haptic Device; J Janáček, L Kubínová; Institute of Physiology ASCR, Czech Republic; XW Mao; Loma Linda University

Poster # 161

3:30 PM 412 Digital Darkfield Analysis of Lattice-Fringe Images with ImageJ; P Fraundorf; University of Missouri-St. Louis

Poster # 162

3:30 PM 413 RGB Analysis of Wedge Angles Around a Perforation in Silicon; J Daugherty, P Fraundorf; University of Missouri-St. Louis

Poster # 163

3:30 PM 414 Image Restoration via Phase-Derived Drift Correction of Movies of 2D Crystals Acquired with a CMOS Direct Electron Detector; AJ Avila-Sakar, BM Milner, F Guo, W Jiang; Purdue University

Poster # 164

3:30 PM 415 Use of the Gabor Filter for Edge Detection in the Analysis of Zinc Oxide Nanowire Images; BE Scanley, TE Sadowski, CC Broadbridge; Southern Connecticut State University; CI Pelligrina, CO Osuji, ME Kreider; Yale University

Poster # 165
Scientific Program

Tuesday 3:30 PM Exhibit Hall AB

3:30 PM 416 EMAN2.1 - A New Generation of Software for Validated Single Particle Analysis and Single Particle Tomography; SC Murray, JG Galaz-Montoya, G Tang, JF Flanagan IV, SJ Ludtke; Baylor College of Medicine

Poster # 166

3:30 PM 491 Multi-scale EBSD and EDS for Detection and Analysis of Spatially Rare Grains and Phases; J Goulden, S Sitzman, K Larsen, H Jiang; Oxford Instruments America, Inc.

Poster # 172

3:30 PM 492 A Simplified Approach to Determining Resolution of Optical, Ion and Electron Microscope Images; AE Curtin, R Skinner, AW Sanders; National Institute of Standards and Technology

Poster # 173

3:30 PM 493 X-ray Microscopy: the Cornerstone for Correlative Characterization Methods in Materials Research and Life Science; A Merkle, J Gelb; Carl Zeiss X-ray Microscopy Inc.; A Orchowski; Carl Zeiss Microscopy GmbH, Germany; J Fuchs; Carl Zeiss AG, Germany

Poster # 174

3:30 PM 494 Multi-Scale Characterization of Different Generations of Gamma Prime Precipitates in Nickel-based Superalloys Using Correlative Microscopy Techniques; TJ Rohrbuskool, A Singh, S Nag, R Banerjee; University of North Texas; JS Tiley; Wright-Patterson Air Force Base

Poster # 175

3:30 PM 495 FIB-SEM Instrument with Integrated Raman Spectroscopy for Correlative Microscopy; J Jiruse, M Hanicenc, M Havelka, TESCAN Brno, s.r.o., Czech Republic; O Hollricher, W Ibach, P Spizig; WITec GmbH, Germany

Poster # 176

3:30 PM 496 Hybrid SEM/AFM System from Carl Zeiss Revolutionizes Analysis of Functional Micro- and Nanostructured Specimen; FF Hitzel, N Anspach; DME Nanotechnology GmbH, Germany; F Zhou; Carl Zeiss Microscopy GmbH, Germany; S Eyhusen; Carl Zeiss Microscopy, LLC

Poster # 177

3:30 PM 497 Correlative Compositional Analysis of Fiber-Optic Nanoparticles; H Francois-Saint-Cyr, I Martin, C Hombourger, D Larson, T Prosa; CAMECA Instruments Inc.; W Blanc; Université Nice Sophia Antipolis, France; P LeCoustumer; Universite, France; D Neuville; Institut de Physique du Globe de Paris, France; C Guillermier; Harvard University

Poster # 178

3:30 PM 498 Correlative Imaging of Stacking Faults using Atom Probe Tomography (APT) and Scanning Transmission Electron Microscopy (STEM); S Dumpala, S Padalkar, SR Broderick, K Rajan; Iowa State University; AA Oni, JM LeBeau; North Carolina State University

Poster # 179

A15.P1 Cs-Correctors: Current State and Ongoing Developments

Poster Session
Tuesday 3:30 PM Exhibit Hall AB

3:30 PM 472 A Need for Bandwidth Limitations in Electron Microscopes; E Voelkl, P Tiemeijer; FEI Company

Poster # 167

3:30 PM 473 Aberration-Corrected STEM by Means of Diffraction Gratings; M Linck, CEOS GmbH, Germany; B McMorrnan, J Pierce; University of Oregon; P Ericks, Lawrence Berkeley National Laboratory

Poster # 168

3:30 PM 474 Circumventing Scherzer’s Theorem: Large Numerical Aperture Objective Lenses for Pulsed Electron Microscopy; BL Rickman, WA Schroeder; University of Illinois, Chicago

Poster # 169

3:30 PM 475 The Real Structure of Cu₃Ni₂SbO₆ and Cu₃Co₂SbO₆ Delafossites with Honeycomb Lattices by Aberration-Corrected HRTEM; R Ramla; Max Planck Institute for Chemical Physics of Solids, Germany; R Schneider; Karlsruhe Institute of Technology, Germany; JH Roudebrush, RJ Cava; Princeton University

Poster # 170

A16.P1 Correlative Microscopy and Microanalysis from Macro to Pico

Poster Session
Tuesday 3:30 PM Exhibit Hall AB

3:30 PM 490 The Strategy of Advanced Analysis in Semiconductor Nano-device: from Nanoprobing to Nanoscopy and Nanoanalysis; L Lai; Semiconductor Manufacturing International (Shanghai) Corp., China

Poster # 171
Scientific Program

3:30 PM  499 Understanding Fayalite Chemistry Using Electron Microscopy and Atom Probe Tomography; BW Arey, DE Perea, L Kovarik, J Liu, AR Felmy; Pacific Northwest National Laboratory

Poster # 180

3:30 PM  500 Beware of Artifacts When Characterizing Nanometer Device Features Smaller Than a TEM Lamella Thickness in Semiconductor Wafer-foundries; W Zhao, H Porter, R Rai, E Chen, J Russell; GlobalFoundries Inc.

Poster # 181

3:30 PM  501 Comprehensive Nanofabrication by Correlating Crossbeam and ORION Nanofab; I Schultmeier; Carl Zeiss Microscopy GmbH, Germany

Poster # 182

3:30 PM  502 A Streamlined Technique to Examine Cell Monolayers by Means of Correlative Light and Transmission Electron Microscopy; WG Janssen, HH Hanson; Mount Sinai School of Medicine; BL Armbruster; Hitachi High-Technologies America, Inc.

Poster # 183

3:30 PM  503 The SECOM Platform: an Integrated CLEM Solution; SV den Hoedt; Delmic BV, Netherlands

Poster # 184

3:30 PM  504 Combining Terapixe Scale SEM Imaging and High-Resolution TEM Studies for Mineral Exploration; D Schumann, A Laquerre, D Mayer, MW Phaneuf; Fibics Inc., Canada; S Fuchs, H Vali; McGill University, Canada; J Stromberg, N Banerjee; University of Western Ontario, Canada

Poster # 185

3:30 PM  505 Correlative Light and Electron Microscopy – On the Way from 2D Towards 3D; AF Elli, E Hummel, C Boeker; Carl Zeiss Microscopy GmbH, Germany

Poster # 186

3:30 PM  506 New preparation Method Using Ionic Liquid for Quick and Faithful SEM Observation of Biological Specimens; M Sakaue, M Shiono, M Konomi, J Tomizawa, E Nakazawa; Hitachi High-Technologies Corporation, Japan; K Kawai; Miyoshi Oil & Fat Co., Ltd.; S Kuwabata; Osaka University

Poster # 187


Poster # 188

3:30 PM  508 Ionic Liquids Preparation for SEM Observation of Minute Crustacean; M Shiono, M Sakaue, M Konomi, J Tomizawa, E Nakazawa; Hitachi High-Technologies Corporation, Japan; K Kawai; Miyoshi Oil & Fat Co., Ltd.; S Kuwabata; Osaka University

Poster # 189

3:30 PM  509 Development of High Pressure Freezing and Correlative Light/ Electron Microscopy for Drosophila Larvae; L Nikolova; University of Utah

Poster # 190

A17.P2 Extended Crystal Defects: Quantification of Strain, Local Atomic Structure and Chemistry

Poster Session
Tuesday 3:30 PM Exhibit Hall AB

3:30 PM  539 Ad Hoc Determination of Local Misorientations and Boundary Planes between Grains in TEM by a Dedicated Software Package Developed for the Gatan DigitalMicrograph Platform; CA Wade, M Watanabe; Lehigh University

Poster # 191

3:30 PM  540 Investigation of Bi Segregation of Cu Bicrystal Boundaries Using Aberration-Corrected STEM Depth Sectioning; CA Wade, M Watanabe; Lehigh University

Poster # 192

3:30 PM  541 Observations on Heavily Deformed Tantalum; MT Janish, CB Carter; University of Connecticut; PG Kotula, BL Boyce; Sandia National Laboratories

Poster # 193

3:30 PM  542 Atomic-scale Observation of Grains and Grain Boundaries in Monolayers of WS2; A Azizi, AL Elias, N Perea-Lopez, M Terrones, N Alem; Pennsylvania State University; X Zou, Z Zhang; BI Yakobson; Rice University; P Ercuis; Lawrence Berkeley National Laboratory

Poster # 194

3:30 PM  543 Imaging Defects in Quantum Materials; DC Bell, E Kaljon-Cohen; Harvard University

Poster # 195

3:30 PM  544 An Electron Microscopic Investigation of (1/3) <0 -1 1 > Dislocations in Bi1Te3 Nanowires: Defect Crystallography and Relationship to 7-layer Bi1Te3 Defects; DL Medlin, KJ Erickson, SJ Limmer, WG Yelton, MP Siegal; Sandia National Laboratories

Poster # 196
Scientific Program

**BIOLOGICAL SCIENCES SYMPOSIA**
**TUESDAY AFTERNOON**

**B03.P1 Nuclear Architecture and Chromatin Structure: 40 Years after the Nucleosome**

*Poster Session*
*Tuesday 3:30 PM Exhibit Hall AB*

3:30 PM **602** *ELCS in Ice: Cryo-electron Microscopy of Nuclear Envelope-Limited Chromatin Sheets;* M Eltsov; European Molecular Biology Laboratory-Heidelberg, Germany; S Sosnovski; École des Neurosciences de Paris Île-de-France; AL Olins, DE Olins; University of New England

3:30 PM **603** *How Histone Modifications Change Nucleosome Stability - FRET Studies on Single Molecules and in Bulk;* K Tóth, A Gansen, J Langowski; German Cancer Research Center, Heidelberg; S Hetey, L Székvölgyi; University of Debrecen, Hungary; L Nordenskjoeld; Nanyang Technological University, Singapore

**Poster # 197**

3:30 PM **681** *Presentation in Microscopy: Selection of Color to Accommodate Those with Color Vision Deficiency;* DR Keene, SF Tufa; Shriners Hospitals for Children

**Poster # 201**

3:30 PM **682** *Artifact-free 3D Reconstruction for Optical Projection Tomography;* J Michalek, M Capek; Institute of Physiology, Academy of Sciences of the Czech Republic

**Poster # 202**

3:30 PM **683** *Expression of TuV tagged Sindbis virus (TR339) in Aedes albopictus cell lines and adult mosquitoes;* J Saredy, D Bowers; University of North Florida

**Poster # 203**

3:30 PM **684** *The Search for MET or a MET Homolog Expressed by Dugesia dorotocephala;* JF Blaize, SJ Browne; Wagner College

**Poster # 205**

**PHYSICAL SCIENCES SYMPOSIA**
**TUESDAY AFTERNOON**

**P02.P2 Advances in In situ Microscopy**

*Poster Session*
*Tuesday 3:30 PM Exhibit Hall AB*

3:30 PM **814** *In situ Characterization of the Evolution of Defects in AlGaN/GaN HEMTs in the On-State and Off-State Condition;* AC Lang, H Ghassemi, ML Taheri; Drexel University; D Meyer; U.S. Naval Research Laboratory

**Poster # 206**

3:30 PM **815** *Novel Method for Precision Controlled Heating of TEM Thin Sections to Study Reaction Processes;* K Unocic, LF Allard, Jr., DW Coffey, KL More, RR Unocic; Oak Ridge National Laboratory

**Poster # 207**

3:30 PM **816** *In situ Sintering of Agglomerated 3% Yttria-stablized Zirconia;* H Majidi, K van Benthem; University of California, Davis; TB Holland; Colorado State University

**Poster # 208**

3:30 PM **817** *In situ Studies of Thermal Stability of Core-Frame Cubic Pd–Rh Nanocrystals at Elevated Temperatures;* N Lu, J Wang, MJ Kim; University of Texas, Dallas; S Xie, Y Xia; Georgia Institute of Technology

**Poster # 209**
Scientific Program

3:30 PM  **818**  In situ Microscopy Studies of Liquid Gallium Droplet Dynamics; C Ngo, S Kodambaka; University of California, Los Angeles

Poster # 210

3:30 PM  **819**  Environmental TEM Study of Electron Beam Induced Sintering of Ag Nanoparticles; Y Liu, Y Sun; Argonne National Laboratory

Poster # 211

3:30 PM  **820**  Study of Dynamic Solid-Liquid Interfacial Phenomena in Hypereutectic Al-Si Alloy Using In situ HRTEM; MM Schneider, JM Howe; University of Virginia

Poster # 212

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**P03.P1 Mineral Analyses from Laboratory to Spacecraft**

Poster Session

Tuesday 3:30 PM Exhibit Hall AB

3:30 PM  **851**  A TEM study on serpentinized peridotite from the Southwest Indian Ridge and implications for the deep ocean hydrothermal system; DJ Miller; Argonne National Laboratory

Poster # 213

3:30 PM  **852**  A Potential Method for Identifying Minerals in Comet Samples Using Raman Spectroscopy with a Laser Scanning Confocal Microscope; AJ White, DS Ebel; American Museum of Natural History

Poster # 214

3:30 PM  **853**  Nanomineralogy of the First Solids in the Solar System: Discovering New Minerals and New Materials; C Ma; California Institute of Technology

Poster # 215

3:30 PM  **854**  M&M Student Awardee A Comparative Study of Electron Energy-Loss Spectroscopy (EELS) and X-ray Absorption Near Edge Structure (XANES) Spectroscopy for Probing the Oxidation State of Transition Metals in Planetary Materials; D. Bosler; University of Arizona; T Zega; University of Arizona

Poster # 216

3:30 PM  **855**  M&M Professional Technical Staff Award A Novel Hybrid Ultramicrotomy/FIB-SEM Technique: Preparation of Serial Electron-Transparent Thin Sections of a Hayabusa Grain; EL Berger, LP Keller; NASA Johnson Space Center

Poster # 217

3:30 PM  **856**  Origin of Asymmetric Symplectitic Texture in Mantle Xenoliths from the Fangshan Basalt, Eastern China; D Zhao; University of Texas, Austin

Poster # 218

3:30 PM  **857**  Micro and Nanoscale Studies of Shock Features within the Chelyabinsk LL5 Meteorite; SS Rout, PR Heck; The Field Museum of Natural History

Poster # 219

3:30 PM  **858**  Taking Automated Mineralogy from the Lab into the Field; C Lang, M Hiscock; Oxford Instruments Nano-Analysis, United Kingdom

Poster # 220

3:30 PM  **859**  Advanced EDS and µXRF Analysis of Earth and Planetary Materials using Spectrum Imaging, Computer-Controlled SEM and an Annular SDD; T Salge, R Tagle; Bruker Nano GmbH, Germany; L Hecht; Museum für Naturkunde, Berlin, Germany; L Ferrière; Naturhistorisches Museum, Germany, Wien; A Ball, AT Kearsley, C Smith, C Jones; London Natural History Museum, United Kingdom

Poster # 221

3:30 PM  **860**  2013 Vicência Meteorite Found in Brazil: Preliminary Classification Efforts Based on Traditional Approaches and Cathodoluminescence (CL) Maps; B Leite; JEOL USA Inc.

Poster # 222

3:30 PM  **861**  Correlated Petrographic Analysis; JA Reffner; John Jay College, City University of New York

Poster # 223

3:30 PM  **862**  Calibrating Standardless Quantitative EDS Results with Limited Standards; J Konopka; Thermo Fisher Scientific

Poster # 224

3:30 PM  **863**  Characterization of Shales By Mass Spectrometry During Ion Milling; RR Cerchiara; E.A. Fischione Instruments, Inc.; NS Fishman; Hess Corporation

Poster # 225
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<th>Poster Session</th>
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<td>3:30 PM</td>
<td><strong>937</strong> Investigation of Grain Flow Microstructure in Forged Nitronic 50 Stainless Steel; RE Goddard, RP Walsh, K Han; Florida State University</td>
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<td>3:30 PM</td>
<td><strong>938</strong> New Approach to Diffuse Scattering in Complex Chalcogenides; D Häußler, L Kienle; Christian-Albrechts University-Kiel; V Duppel; Max Planck Institute for Solid State Research Stuttgart, Germany; M Schlosser, A Pfitzner; University of Regensburg, Germany</td>
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<td>3:30 PM</td>
<td><strong>939</strong> Extreme Ductility at the Nanoscale in Fe-based Alloys; ED Hintsala, WW Gerberich; University of Minnesota; D Kiener; University of Leoben, Austria</td>
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<td>3:30 PM</td>
<td><strong>940</strong> Use of FIB to Identify Opens in Metal – Metal Bonds; N Wang, J Silva, G Perreault; Maxim Integrated Products Inc.</td>
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<td>3:30 PM</td>
<td><strong>941</strong> Cement-Matrix Composites Reinforced with Carbon Fibers as a Multifunctional Material; FJ Baldenegro-Lopez, JE Ledezma-Sillas, R Martinez-Sanchez, JM Herrera-Ramirez; Centro de Investigación en Materiales Avanzados, Mexico; JH Castorena-Gonzalez, JA Baldenegro-Lopez, JJ Velazquez-Dimas; Universidad Autonomia de Sinaloa, Mexico</td>
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<td>3:30 PM</td>
<td><strong>942</strong> Adiabatic Shear in Ordnance Components and Threaded Connections; MA Hineman, FE Schmidt, Jr., JD Fuerst; Engineering Systems Inc.</td>
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<td>3:30 PM</td>
<td><strong>943</strong> Fractographic Analysis of Co-P-SiC Electrocomposite Coatings by Stereoscopic Reconstruction; S Vijayan, M Aindow; University of Connecticut; A Datta, JD Carpenter; US Chrome Corporation</td>
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<td>3:30 PM</td>
<td><strong>944</strong> Hardening of Copper Induced by High Energy Xenon Ion Bombardment; AS Khalil; Tabbin Institute for Metallurgical Studies, Egypt</td>
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<td><strong>971</strong> Sensitivity of an Atomic Force Microscope Cantilever With a Crack; H-L Lee, Y-C Yang, W-J Chang; Kun Shan University, Taiwan</td>
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<td>3:30 PM</td>
<td><strong>972</strong> Microstructural Changes and Enhanced Current Density in Nano-sized HoO2 Added (Bi1_pPb0_4Sr0_3Ca0_2Cu0_2O_y)/Ag Superconductor Tapes; R Abd-Shukor, NAA Yahya; Universiti Kebangsaan Malaysia</td>
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<td>3:30 PM</td>
<td><strong>974</strong> Primary Particle Size Distribution Measurement of Nanomaterials by Using TEM; K Yamamoto, T Fujimoto; National Institute of Advanced Industrial Science and Technology, Japan</td>
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<td>3:30 PM</td>
<td><strong>975</strong> Effect of pH-11 Buffer as Agent Reaction Moderator in the Growth and Characterization of CdS Thin Films by CBD Technique; A Garcia, J Bernal; Universidad Politecnica de Pachuca, Mexico</td>
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<td>3:30 PM</td>
<td><strong>976</strong> Characterization of Polycaprolactone Films Biodeterioration by Scanning Electron Microscopy; K Hrubanova, V Krzyzanek; Institute of Scientific Instruments ASCR, Czech Republic; S Vobkerova; Mendel University in Brno; S Hermanova; Institute of Chemical Technology Prague, Czech Republic</td>
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<td><strong>Poster # 239</strong></td>
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3:30 PM 977 Antimony Doped Tin Oxide Aerogels for Applications in Energy Conversion and Energy Storage; JP Correa-Baena, V Rastegar, AG Agrios, CB Carter; University of Connecticut; PG Kotula; Sandia National Laboratories, Albuquerque

Poster # 240

3:30 PM 978 Interface Analysis of Complex Oxide Ceramics in Electrolyte Supported Solid Oxide Fuel Cell; G Wetzel, LV Saraf, T Darroudi, O Dillon; Clemson University; JJ Clarke; Hitachi High Technologies America, Ltd.

Poster # 241

3:30 PM 979 Assessment of Cationic Lignin as a Chloride Ion Scavenging Additive in Cement; E Ten, Y Tsui, W Vermerris; University of Florida

Poster # 242

3:30 PM 980 Crystal Structure, Cation Occupancy and Vacancy Ordering in Thermoelectric (1-x)SrTiO$_3$-xLa$_{1/3}$NbO$_3$; A STEM-EELS Study; F Azough, D Srivastava, R Freer; University of Manchester, United Kingdom; D Kepaptsovoglou, Q Ramasse; SuperSTEM, United Kingdom

Poster # 243

3:30 PM 981 Sulfidation of Molybdenum Oxide and Tungsten Oxide Crystallites: An Ex Situ TEM Study; CE Kliewer, SL Soled, S Miseo; ExxonMobil Research & Engineering

Poster # 244

3:30 PM 982 The Role of Multi-Hit Detection Events on the Accurate Measurement of Boron in Atom Probe Tomography; F Meisenkothen, EB Steel; National Institute of Standards and Technology; T Prosa; Cameca Instruments, Inc.; RP Kolli; University of Maryland

Poster # 245

3:30 PM 983 Interfacial Atomic Structure of BiOx Functionalized ZnO Nanowires; J Xu, J Liu; Arizona State University

Poster # 246

3:30 PM 984 (Invited) Compression Properties of an Al$_{2024}$ Composite Reinforced with SiC Nanoparticles; C Carreño, I Estrada, R Martínez; Centro de Investigación en Materiales Avanzados, Mexico; C López; Universidad La Salle Chihuahua, Mexico

Poster # 247
Scientific Program

Wednesday, August 6, 2014

TECH FORUM SYMPOSIA
WEDNESDAY MORNING

X30.01 Tech Forum Special Topics

Session Chairs:
Lee Cohen-Gould, Cornell University;
Frank Macaluso, Albert Einstein College of Medicine

Platform Session
Wednesday 8:30 AM • Room: 27

8:30 AM 1062 (Invited) Choosing a Fluorescence Microscopy Imaging Modality for Live Quantitative Experiments; JC Waters; Harvard Medical School

9:00 AM 1063 (Invited) After Capture: Fundamentals of Images, their Storage, Visualization, Processing and Quantification; SA Johnson; Duke University

ADVANCES IN INSTRUMENTATION SYMPOSIA
WEDNESDAY MORNING AFTERNOON

A02.04 Advances in Imaging and Spectroscopy in STEM

Session Chairs:
Nigel D. Browning, Pacific Northwest National Laboratory;
Peter D. Nellist, University of Oxford, United Kingdom;
Maria Varel del Arco, Oak Ridge National Laboratory

Platform Session
Wednesday 8:30 AM • Room: 14

8:30 AM 37 (Invited) Assessing and Controlling the Size, Morphology and Composition of Supported Bimetallic Catalyst Nanoparticles; CJ Kiely, Q He, R Tiruvalam; Lehigh University; N Dimitratos, MM Forde, M Sankar, GJ Hutchings; Cardiff University, United Kingdom

9:00 AM 38 Experimental and Theoretical Atomic-Resolved EELS Studies on Nitrogen Doped Single-Walled Carbon Nanotubes; R Arenal; Universidad de Zaragoza, Spain; K March, CP Ewels, X Rocquefelte, Nantes; M Kociak, O Stephan Université Paris Sud, France; A Loiseau; École Polytechnique, France

9:15 AM 39 (Invited) Studying Tomorrow’s Materials Today: Insights with Quantitative STEM, EELS; GA Botton, M Bugnet, KJ Dudeck, N Gauquelin, H Liu, S Prabhudev, A Scullion, S Stambula, SY Woo, G-Z Zhu; McMaster University, Canada; HPT Nguyen, Z Mi; McGill University

9:45 AM 40 Fine Structural Studies of AlGaN Laser Heterostructures with Digitally Alloyed Quantum Wells Grown on c-Al2O3 by Plasma-assisted Molecular Beam Epitaxy; VV Jmerik, DV Nechaev, SV Ivanov; Ioffe Physical-Technical Institute, Russia; S Rouvimov; University of Notre Dame

A06.01 Super Resolution Microscopic Methods

Session Chairs:
Angus I. Kirkland, University of Oxford, United Kingdom;
John M. Rodenburg, University of Sheffield, United Kingdom

Platform Session
Wednesday 8:30 AM • Room: 11

8:30 AM 184 (Invited) Coherent Diffraction Imaging; J Miao; University of California, Los Angeles

9:00 AM 185 Modeling Extensions of Fourier Ptychographic Microscopy; R Horstmeyer, X Ou, C Yang; California Institute of Technology; G Zheng; University of Connecticut

9:15 AM 186 (Invited) Super-resolved Ptychographic Imaging; A Maiden; Sheffield University, United Kingdom

9:45 AM 187 Generalised Holography Meets Coherent Diffractive Imaging; AJ D’Alfonso, AJ Morgan, AW Yan, LJ Allen; University of Melbourne; P Wang; Nanjing University, China; H Sawada; JEOL, Ltd., Japan; AI Kirkland; University of Oxford, United Kingdom
A07.05 Microscopy and Spectroscopy for Power Generation and Energy Storage

Session Chairs:
Yimei Zhu, Brookhaven National Laboratory; Eva Olsson, Chalmers University, Sweden

Platform Session
Wednesday 8:30 AM • Room: 15

8:30 AM 217 (Invited) Revealing the Origin of "Phonon Glass-Electron Crystal" Behavior in Thermoelectric Layered Cobaltate by Accurate Displacement Measurement; Y Zhu; Brookhaven National Laboratory

9:00 AM 218 Surface Reduction in Monoclinic BiVO4 for Photocatalytic Applications; MD Rossell, A Borgschulte, R Erni; Swiss Federal Laboratories for Materials Science and Technology

9:15 AM 219 Nanostructure-Assisted Phonon Scattering in Lead-Free Thermoelectric Materials: A TEM Investigation of the SnTe System; F Shi, S-H Lo, G Tan, L-D Zhao, MG Kanatzidis, V Dravid; Northwestern University

9:30 AM 220 Observing the Interplay Between Composition and Phonon Transport in BiTe2-Se Alloys using ADF STEM; JH Dycus, A Oni, X Sang, T Chan, C Koch, JM LeBeau; North Carolina State University

9:45 AM 221 Capturing the Structure of Mesoporous Silica Nanoparticles in Solution with Cryo-TEM; KA Spoth, Y Sun, U Wiesner, LF Kourkoutis; Cornell University

A09.01 Frontiers in Analytical TEM-STEM

Session Chairs:
Gianluigi Botton McMaster University, Canada; Juan-Carlos Idrobo, Oak Ridge National Laboratory; Ai Leen Koh, Stanford University; Paolo Longo, Gatan Inc.

Platform Session
Wednesday 8:30 AM • Room: 22

8:30 AM 278 (Invited) Oxygen Vacancy Ordering: a Degree of Freedom that can Control the Structural, Electronic and Magnetic Properties of Transition-Metal Oxide Films; M Varela; Oak Ridge National Laboratory; J Salafranca, N Biskup; Universidad Complutense de Madrid, Spain; J Gazquez; Institut de Ciencia de Materials de Barcelona, Spain MP Oxley, W Luo, ST Pantelides; Vanderbilt University; V Mehta; University of California, Berkeley; Y Suzuki; Stanford University; S Bose, M Sharma, C Leight; University of Minnesota; SJ Pennycook; University of Tennessee

9:00 AM 279 Energy-Filtered High-Angle Dark Field Mapping of Ultra-Light Elements; TC Lovejoy, N Delby, GJ Corbin, P Hrncirik, ZS Szilagyi, OL Krivanek; Nion; T Aoki; Arizona State University

9:15 AM 280 (Invited) Observation of Layer by Layer Graphitization of 4H-SiC, Through Atomic-EELS at Low Energy; G Nicotra, M Scuderi, I Deretzis, F Giannazzo, A La Magna, CR Spinella; CNR- Institute for Microelectronics and Microsystems, Italy; P Longo, RD Twesten; Gatan Inc.

9:30 AM 281 (Invited) Atomic-Scale STEM-EELS Characterization of the Chemistry of Structural Defects and Interfaces in Energy-Related Materials; QM Ramasse, DM Kepaptsoglou; SuperSTEM Laboratory; F Azough; University of Manchester, United Kingdom; R Mainz, R Mainz, A Webber, D Abou-Ras; Helmholtz Zentrum Berlin, Germany; E Simsek, P van Aken; Max Planck Institute for Intelligent Systems, Germany

A11.01 Frontiers of Electron-Probe Microanalysis

Session Chairs:
John Armstrong, Carnegie Institution for Science; Paul Carpenter, Washington University in St. Louis; Hideyuki Takahashi, JEOL Ltd., Japan; Mike Jercinovic, University of Massachusetts Amherst

Platform Session
Wednesday 8:30 AM • Room: 24

8:30 AM 340 (Invited) Analytical Challenges and Strategies in FE-EPMA; S Richter, PT Pinard; RTWH Aachen, Germany

9:00 AM 341 (Invited) Present State of TEM-SXES Analysis and its Application to SEM aiming Chemical Analysis of Bulk Materials; H Takahashi, N Handa, T Murano; JEOL Ltd., Japan.; M Koike, T Imazono; Japan Atomic Energy Agency; M Koeda, T Nagano, H Sasai, Y Oue, Z Yonezawa, S Kuramoto; Shimadzu Corp., Japan

9:30 AM 342 Exciting Possibilities of Soft X-ray Emission Spectroscopy as Chemical State Analysis in EPMA and FESEM; H Takahashi, T Murano, N Handa; JEOL Ltd.; M Terauchi; Tohoku University, Japan; M Koike, T Imazono; Japan Atomic Energy Agency; M Koeda, T Nagano; Shimadzu Corp., Japan
Scientific Program

9:45 AM 343 Recent Achievement of Electron Beam Deceleration Method for FE-SEM Enhanced Elemental Analysis including Soft X-ray Emission Spectroscopy; S Asahina, Y Sakuda, T Murano, H Takahashi, N Kikuchi, K Kawuchi, T Nokuo; JEOL, Ltd., Japan.; F Schüth; Max-Planck-Institut für Kohlenforschung, Germany; O Terasaki; Stockholm University, Sweden

A12.03 3D Imaging and Microanalysis: Image Analysis and Applications

Session Chairs:
Paul G. Kotula, Sandia National Laboratories;
Keana Scott, National Institute of Standards and Technology

Platform Session
Wednesday 8:30 AM • Room: 17

8:30 AM 388 (Invited) The Use of NanoComputed Tomography to Enhance Musculoskeletal Research; S Khoury, E Bigelow, L Smith, R Goulet, E Scheller, K Jepsen; University of Michigan; N Andarawis-Puri; Mount Sinai School of Medicine

9:00 AM 389 Subsurface Particle Analysis using X-Ray Computed Tomography and Confocal X-Ray Fluorescence; NL Cordes, GJ Havrilla, BM Patterson; Los Alamos National Laboratory; S Seshadri, M Feser; Carl Zeiss X-ray Microscopy, Inc.; X Yuan, Y Gu, D Wang; Julius Kruttschnitt Mineral Research Centre, Australia

9:15 AM 390 Multi-scale Imaging of Al-7at.per. Cu Eutectics using Micro- and Nano-scale X-ray Computed Tomography; BM Patterson, K Henderson, P Gibbs, SD Imhoff, AJ Clarke; Los Alamos National Laboratory

9:30 AM 391 Nano-Dot Markers for Electron Tomography Formed by Electron Beam-Induced Deposition: Nanoparticle Agglomerates Application; M Hayashida; National Institute of Advanced Industrial Science and Technology, Japan; M Bergen, P Li, M Malac; National Institute of Nanotechnology, Canada

9:45 AM 392 3D Nanoscale Analysis of Zeolite Catalysts by Electron Tomography and Image Processing; J Zecevic, PE de Jongh, KP de Jong; Utrecht University, Netherlands; C Gommers; University of Liége, Belgium; H Friedrich; Eindhoven University of Technology, Netherlands

A13.01 Practical Applications and Analytical Trends of Metallography and Microstructure

Session Chairs:
Frauke Hogue, Hogue Metallography;
Frank Mücklich Saarland University, Germany

Platform Session
Wednesday 8:30 AM • Marriott Ballroom B

8:30 AM 417 (Invited) Opening the Door to Fundamental Understanding of Structure and Color Metallography – a Correlative Microscopy Study on Steel; D Britz, A Hegetschweiler, F Mücklich; Saarland University, Germany

9:00 AM 418 (Invited) Design of Novel Graded Microstructures for Cutting Tools Assisted by High Resolution Microscopy and Thermodynamic Modeling; JL Garcia; Sandvik Coromant, Sweden

9:30 AM 419 Correlative Tomography – Extraction of Reliable Information with Adequate Resolution from mm scale down to sub-nm scale; F Muecklich; Saarland University, Germany

9:45 AM 420 Measurement of Decarburization of Heat Treated Steel Surfaces; GF Vander Voort; Struers Inc.

A17.05 Extended Crystal Defects: Quantification of Strain, Local Atomic Structure and Chemistry

Session Chairs:
Douglas L. Medlin, Sandia National Laboratories;
Jim Ciston, Lawrence Berkeley National Laboratory;
Yoosuf N. Picard, Carnegie Mellon University

Platform Session
Wednesday 8:30 AM • Room: 12

8:30 AM 527 Column-by-Column Imaging of Dislocation Slip Processes in CdTe; C Li, AR Lupini; Oak Ridge National Laboratory; Y Wu, N Paudel, Y Yan; The University of Toledo; SJ Pennycook; University of Tennessee

8:45 AM 528 Statistical Characterization of High Angle Graphene Grain Boundaries at Atomic Resolution; C Ophus, H Rasool, A Zettle, MF Crommie, U Dahmen; Lawrence Berkeley National Laboratory

9:00 AM 529 Atomic Imaging Across Boundary in Bilayer Graphene with ADF-STEM and DF-TEM; R Hovden, J Alden, AW Tsen, PY Huang, L Brown, J Park, PL McEuen, DA Muller; Cornell University
Scientific Program

B10.01 Microscopy, Microanalysis and Image Analysis in the Pharmaceutical Sciences

Session Chairs:  
Lynn DiMemmo, Bristol-Myers Squibb;  
Alejandra Camacho, L’Oreal

Platform Session
Wednesday 8:30 AM • Room: 23

8:30 AM  703 (Invited) Chewing the Fat: Is Autophagy a Potential Therapeutic Target for Atherosclerosis and Other Diseases of Sterol Metabolism?; J Jerome, CE Romer, CD Netherland-Van Dyke; Vanderbilt University

9:00 AM  704 (Invited) CryoEM Based Models for Adenovirus Neutralization by Human Alpha-Defensin 5; N Gulati, PL Stewart; Case Western Reserve University; JG Smith; University of Washington; GR Nemerow; The Scripps Research Institute

9:30 AM  705 (Invited) Transmission Electron Microscopy Used to Diagnose Acute Toxoplasmosis in a Quarantined, Captive Born Cynomolgus Macaque; JR Megill, J MacGuire, EB Janovitz; Bristol-Myers Squibb

PHYSICAL SCIENCES SYMPOSIA

P02.05 Advances in In situ Microscopy

Session Chairs:  
David A. Muller, Cornell University;  
Haimei Zheng, Lawrence Berkeley National Laboratory;  
Adam P. Hitchcock, McMaster University, Canada;  
Thomas LaGrange, Lawrence Livermore National Laboratory

Platform Session
Wednesday 8:30 AM • Marriott Ballroom C

8:30 AM  772 (Invited) Nanoscale Wear as a Stress-Assisted Chemical Reaction: An In situ TEM Study; RW Carpick, TDB Jacobs; University of Pennsylvania

9:00 AM  773 High Plastic Strain of Silica Microparticles under Electron Beam Irradiation; D Stauffer, S Bhowmick, R Major, O Warren, S Asif; Hysitron, Inc.

9:15 AM  774 Mechanical and Electrical Control of Charged Domain Walls in Ferroelectric Materials; L Li, J Jokisaari, X Pan; University of Michigan; A Melville, C Adamo, D Schlom; Cornell University

BIOLOGICAL SCIENCES SYMPOSIA

WEDNESDAY MORNING

B05.02 Structural Biology and Ultrastructure

Session Chairs:  
Michael Radermacher, University of Vermont;  
Paula da Fonseca, MRC Laboratory of Molecular Biology, United Kingdom;  
Ingeborg Schmidt-Krey, Georgia Institute of Technology;  
Caroline Miller, Indiana University

Platform Session
Wednesday 8:30 AM • Room: 21

8:30 AM  625 (Invited) Turning a Liability into an Asset: Radiation Damage as a Cytochemical Marker; N Cheng, W Wu, NR Watts, J Fontana, AC Steven; National Institute of Arthritis, Musculoskeletal and Skin Diseases

9:00 AM  626 M&M Student Awardee Seeing the Portal in Membrane-containing Bacteriophage PRD1 by Cryo-EM; C Hong, X Liu, J Jakana, W Chiu; Baylor College of Medicine; HM Oksanen, DH Bamford; University of Helsinki, Finland

9:15 AM  627 M&M Post-Doctoral Researcher Awardee Structure of the Yeast Mitochondrial Large Ribosomal Subunit; A Amunts; MRC Laboratory of Molecular Biology, United Kingdom

9:30 AM  628 ResLog Plots: A New Metric for Quality of Cryo-EM Reconstructions; S Stagg, AJ Noble, M Spilman, M Chapman; Florida State University

9:45 AM  629 Structural Characterization of Tethered HIV-1 VLPs by Light Microscopy and Cryo-Electron Tomography; JD Strauss, JE Hammonds, PW Spearman, ER Wright; Emory University
Scientific Program

9:30 AM  **775 M&M Student Awardee** In situ Biasing TEM Characterization of Resistive Switching Phenomena in TiO₂-based RRAM; J Kwon, AA Sharma, JA Bain, YN Picard, M Skowronski; Carnegie Mellon University

9:45 AM  **776 In situ STEM of Ag and Cu Conducting Bridge Formation through Al₂O₃ in Nanoscale Resistive Memory Devices**; WA Hubbard, ER White, A Kerelsky, JJ Lodico, BC Regan; University of California, Los Angeles

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**P04.05 Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges**

Session Chairs:
Raul Arenal, Universidad de Zaragoza, Spain;
Kazu Suenaga, National Institute of Advanced Industrial Science and Technology, Japan

Platform Session
Wednesday 8:30 AM • Room: 16

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8:30 AM  **884 (Invited) Atomic Resolution Study of Defects in Graphene**; J Warner; University of Oxford, United Kingdom

9:00 AM  **885 M&M Student Awardee** Deadtime Correction and Hydride Evaluation for Atom-Probe Data, with Applications for Studies of Nanoscale Grains and Carbon; JB Lewis, C Floss, TL Daulton; Washington University; D Isheim, DN Seidman; Northwestern University

9:15 AM  **886 (Invited) In situ High Temperature Atomic Resolution Transmission Electron Microscopy of 2D Nanomaterials**; AL Gibb, A Zettl; University of California Berkeley; N Alem; The Pennsylvania State University; J-H Chen; Peking University, China; J Ciston; Lawrence Berkeley National Lab

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**P05.01 Microanalysis of Irradiated Materials: Preparation, Instrumental Development, and Analysis**

Session Chairs:
Karen E. Wright, Idaho National Laboratory;
Olivier Dugne, French Alternative Energies and Atomic Energy Commission;
Philipp Poeml, EC-JRC Institute for Transuranium Elements, Germany;
Adam Robinson, University of Cambridge, United Kingdom

Platform Session
Wednesday 8:30 AM • Room: 25

8:30 AM  **901 (Invited) Microbeam Analysis Techniques for the Characterisation of Irradiated Nuclear Fuel**; S brémier; EC-JRC Institute for Transuranium Elements, Germany

9:00 AM  **902 (Invited) Use of Secondary Ions Mass Spectrometry (SIMS) for Cladding Materials Post-Irradiation Examination (PIE)**; SEP Portier, N Mine, M Martin; Paul Scherrer Institute, Switzerland

9:30 AM  **903 (Invited) Electron Backscatter Diffraction of Nuclear Materials**; D Jädernäs, P Tejland; Studsvik Nuclear AB, Sweden

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**P06.01 Failure Analysis of Structural Materials: Microscopy, Metallography and Fractography**

Session Chairs:
Daniel P. Dennies, Exponent Inc.;
Ronald J. Parrington, IMR Test Labs

Platform Session
Wednesday 8:30 AM • Room: 26

8:30 AM  **924 (Invited) Failure Analysis of a Jet Engine High Pressure Turbine Blade**; DM Christie; IMR Test Labs

9:00 AM  **925 Microscale Metallography Using Focused Ion Beam**; J Trenkle; Exponent, Inc.


9:45 AM  **927 Evaluation of Liquid Metal Embrittlement of Oxide Dispersion Strengthened Steel MA956**; BW Baker; United States Naval Academy; LN Brewer; Naval Postgraduate School
Scientific Program

P07.02 Microscopy and Characterization of Ceramics, Polymers, and Composites
Session Chairs:
S.K. Sundaram, Alfred University; James E. Martinez, NASA Johnson Space Center
Platform Session
Wednesday 8:30 AM • Marriott Ballroom A

8:30 AM 949 (Invited) Determining the Source of Water Vapor in a Cerium Oxide Electrochemical Oxygen Separator to Achieve Aviator Grade Oxygen; J Graf, J Martinez; NASA Johnson Space Center; D Taylor; Ceramatec, Inc.

9:00 AM 950 TEM/STEM Analysis of NiO Reduction to Ni during Annealing in H₂ Atmosphere; K Manukyan, S Rouvimov, AS Mukasyan; University of Notre Dame; S Kharatyan; Institute of Chemical Physics, Armenia

9:15 AM 951 Low Energy TEM Characterizations of Ordered Mesoporous Silica-Based Nanocomposite Materials for Catalytic Applications; JF Al-Sharab, S Das, A Goswami, T Asefa; Rutgers University; E Mikmeková; Institute of Scientific Instruments of the ASCR, Czech Republic; SM El-Sheikh, AA Ismail; Central Metallurgical Research and Development Institute, Egypt; M Hesari, F Maran; University of Padova, Italy

9:30 AM 952 Highly Active CeO₂ Nanorods Support for CO Oxidation; R Wang; Youngstown State University

9:45 AM 953 M&M Student Awardee Investigation of the Nature and Mechanism of Resistive Switching in TiO₂; A Moballegh, EC Dickey; North Carolina State University

P09.04 Surface & Subsurface Microscopy & Microanalysis in Materials and Biological Systems
Session Chairs:
Vincent S. Smentkowski, General Electric; John A. Chaney, The Aerospace Corporation; Chanmin Su, Bruker-Nano, Inc.
Platform Session
Wednesday 8:30 AM • Marriott Ballroom D

8:30 AM 1035 Applications of Atomic Force Microscopy in Industrial Polymer Systems; L Yang, O Guise; SABIC Innovative Plastics, Netherlands

8:45 AM 1036 (Invited) The Impact of Estrogen Depletion and Drug Treatment on Type I Collagen Microstructure; M Cauble, E Rothman, K Welch, M Fang, B Orr, M Banaszak Holl; University of Michigan; L Duong, B Pennypacker; Merck

9:15 AM 1037 Nanoscale Calorimetry Reveals Higher Stability of Cholesterol Induced Nanoscale Domains in Lipid Bilayers; GE Fantner, BW Erickson; Ecole Polytechnique Federal de Lausanne, Switzerland

9:30 AM 1038 Time-Resolved Nanometer Scale AFM Imaging of Antimicrobial Peptide Activity on Live Escherichia coli Cells; A Slade, SC Minne; Bruker Nano Inc.

BIOLGICAL SCIENCES TUTORIAL WEDNESDAY MORNING

X50.01 Filling the Missing Wedge
Session Chair:
Scott Stagg, Florida State University
Platform Session
Wednesday 8:30 AM • Room: 13

8:30 AM 1070 Template Matching, Alignment and Averaging of Sub-Tomograms in Electron Cryo-Tomography Reconstructions using Isotomo; JT Huiskonen; University of Oxford, United Kingdom
A02.05 Advances in Imaging and Spectroscopy in STEM

Session Chairs:
Nigel D. Browning, Pacific Northwest National Laboratory; Peter D. Nellist, University of Oxford, United Kingdom; Maria Varela del Arco, Oak Ridge National Laboratory

Platform Session
Wednesday 10:30 AM • Room: 14

10:30 AM 41 (Invited) Modeling Secondary Electron Imaging at Atomic Resolution Using a Focused Coherent Electron Probe; L J Allen, H G Brown, A J D’Alfonso; University of Melbourne; J Ciston; Lawrence Berkeley National Laboratory; Y Lin, L Marks; Northwestern University

11:00 AM 42 Atomic-resolution Imaging Using Cs-corrected Vortex Beams; P Ercius; Lawrence Berkeley National Laboratory; T Harvey, J Pierce, J Chess, B McMorran; University of Oregon; M Linck; CEOS GmbH, Germany

11:15 AM 43 STEM Optical Sectioning for Imaging Screw Displacement in Dislocation Core Structures; P D Nellist, H Yang, J G Lozano, P B Hirsch; University of Oxford, United Kingdom; T J Pennycook; SuperSTEM Laboratory, United Kingdom

11:30 AM 44 The Versatile Imaging Capabilities of Aberration-Corrected STEM; J Liu; Arizona State University

11:45 AM 45 Inelastic STEM Imaging Based on Low-Loss Spectroscopy; M P Oxley, M D Kapetanakis, S T Pantelides; Vanderbilt University; M P Prange; Pacific Northwest National Laboratory; W Zhou, J-C Idrobo; Oak Ridge National Laboratory; S J Pennycook; University of Tennessee, Knoxville

A06.02 Super Resolution Microscopic Methods

Session Chairs:
Angus I. Kirkland, University of Oxford, United Kingdom; John M. Rodenburg, University of Sheffield, United Kingdom

Platform Session
Wednesday 10:30 AM • Room: 11

10:30 AM 188 (Invited) Atomically Resolved Scanning Confocal Electron Microscopy Using a Double Aberration-corrected Transmission Electron Microscope; P Wang; Nanjing University; A I Kirkland, P D Nellist; University of Oxford, United Kingdom; A J D’Alfonso, A J Morgan, L J Allen; University of Melbourne, Australia; A Hashimoto, M Takeguchi, K Mitsuishi; National Institute for Materials Science, Japan; M Shimoo; Shibaura Institute of Technology, Japan

10:45 AM 189 (Invited) Towards High Resolution in TEM and STEM: What are the Limitations and Achievements; M Haider, S Uhlemann, P Hartel, H Mueller; CEOS GmbH, Germany

11:15 AM 190 Resolution Enhancement at Low-Accelerating-Voltage by Improvements of Diffraction Limit and Chromatic Aberration; T Sasaki, H Sawada, F Hosokawa; JEOL, Ltd., Japan; K Suenaga; National Institute of Advanced Industrial Science and Technology, Japan

11:45 AM 191 Maximum Efficiency STEM Phase Contrast Imaging; T J Pennycook; SuperSTEM, United Kingdom; A R Lupini; Oak Ridge National Laboratory; L Jones, P D Nellist; University of Oxford, United Kingdom

A07.06 Microscopy and Spectroscopy for Power Generation and Energy Storage

Session Chairs:
Miaofang Chi, Oak Ridge National Laboratory; Feng Wang, Brookhaven National Laboratory

Platform Session
Wednesday 10:30 AM • Room: 15

10:30 AM 222 A 3D Phase Evolution Panorama Uncovered Using a Grid-in-a-Coin Cell Method for Conversion Reaction Electrodes in Lithium-ion Batteries; H L Xin; Brookhaven National Laboratory; F Li; Lawrence Berkeley National Laboratory

10:45 AM 223 Characterizing Sulfur in TEM and STEM, with Applications to Lithium Sulfur Batteries; B Levin, M J Zachman, J G Werner, U Wiesner, L F Kourkoutis, D A Muller; Cornell University
Scientific Program

Wednesday August 6

11:00 AM 224 (Invited) Understanding the Surface Structure of LiNi$_{0.45}$Mn$_{1.55}$O$_4$ Spinel Cathodes with Aberration-Corrected HAADF STEM; CD Amos, J Song, JB Good-enough, PJ Ferreira; University of Texas, Austin

11:15 AM 225 Tracking Displacement Reactions in Cu$_x$V$_2$O$_5$ Cathodes by In-Situ TEM; P Gao, X Wang, L Wang, F Wang; Brookhaven National Laboratory

11:30 AM 226 Probing Electrochemical Cycling Stability of Li-ion Cathode Materials at Atomic-scale; M Chi; Oak Ridge National Laboratory; B Xu, C Fell, S Meng; University of California, San Diego; J Yang; University of Washington

11:45 AM 227 In situ TEM Observation of Electrochemical Cycling of a Si/TiO$_2$ Composite NW; SJ Kim, X Pan; University of Michigan; A Kargar, D Wang; University of California, San Diego

A09.02 Frontiers in Analytical TEM-STEM

Session Chairs:
Gianluigi Botton McMaster University, Canada;
Juan-Carlos Idrobo, Oak Ridge National Laboratory;
Ai Leen Koh, Stanford University;
Paolo Longo, Gatan Inc.

Platform Session
Wednesday 10:30 AM • Room: 22

10:30 AM 282 (Invited) XEDS in the AEM: Has Everything Thing That Can be Invented, Been Invented; NJ Zaluzec; Argonne National Laboratory

11:00 AM 283 The Effect of Probe Correctors on the Analytical Results of Non-ideal Samples; J Ringnalda, A Genc; FEI Company; L Kovarik; Pacific Northwest National Laboratory

11:15 AM 284 Aberration-Corrected Four-Detector STEM-EDS Analysis of Embedded Nanoclusters; CM Parish, MK Miller; Oak Ridge National Laboratory

11:30 AM 285 (Invited) Quantitative EDX and EELS Elemental Mapping at Atomic Resolution; G Kothleitner, W Grogger, F Hofer; Technische Universität Graz, Germany; MJ Neish, NR Lugg, LJ Allen; University of Melbourne, Australia; SD Findlay; Monash University, Australia

A10.01 X-ray Imaging

Session Chairs:
Jeffrey M. Davis, National Institute of Standards and Technology; Ric WurHER, University of Western Sydney, Australia; Eric Telfeyan, U.S. Environmental Protection Agency

Platform Session
Wednesday 10:30 AM • Room: 12

10:30 AM 317 X-Ray Mapping Investigations of Salt Migration in Seeds through use of Window and Windowless Silicon Drift Detectors; R WurHer; University of Western Sydney, Australia; L Guja; Australian National Botanic Gardens; D Merritt; University of Western Australia; K Moran; Moran Scientific, Australia

10:45 AM 318 Identification of New Lithic Clasts in Lunar Breccia 14305 by Micro-CT and Micro-XRF Analysis; R Zeigler; NASA Johnson Space Center; P Carpenter, B Jolliff; Washington University St. Louis

11:00 AM 319 Ultra High Solid Angle EDS System Advanced STEM Analysis for FE-SEM; Y Nakajima, N Kikuchi, S Asahina, K Kawachi, T Nokuo; JEOL Ltd., Japan; M Suzuki; Thermo Fisher Scientific; N Erdman, M Shibata; JEOL USA, Inc.

11:15 AM 320 Large Area EDS Mapping Automated Collection of High Resolution Elemental Maps For Post Acquisition Analysis; A Hyde, C McCarthy, S Burgess; Oxford Instruments, United Kingdom; N Meeks; The British Museum, United Kingdom

11:30 AM 321 (Invited) Multidimensional Data Sets – Presentation, Evaluation and Extraction; M Haschke, U Waldschläger, R Tagle, U Rossek; Bruker Nano GmbH, Germany

A11.02 Frontiers of Electron-Probe Microanalysis

Session Chairs:
John Armstrong, Carnegie Institution for Science;
Paul Carpenter, Washington University in St. Louis;
Hideyuki Takahashi, JEOL Ltd., Japan;
Mike Jercinovic, University of Massachusetts Amherst

Platform Session
Wednesday 10:30 AM • Room: 24

10:30 AM 344 (Invited) Strategies for Low Accelerating Voltage X-ray Microanalysis of Sub-Micrometer Features with the FE-EPMA; P McSwiggen; McSwiggen & Associates; JT Armstrong; Carnegie Institution of Washington; C Nielsen; JEOL, Inc.
# Scientific Program

### A12.04 3 D Imaging and Microanalysis: Image Analysis and Applications

Session Chairs:
Paul G. Kotula, Sandia National Laboratories; Keana Scott, National Institute of Standards and Technology

**Platform Session**
**Wednesday 10:30 AM • Room: 17**

<table>
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<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>10:30 AM</td>
<td>393</td>
<td><strong>TFS: Combined Tilt- and Focal Series Scanning Transmission Electron Microscopy</strong>; T Dahmen; DFKI GmbH, Germany; N de Jonge; Leibniz Institut für Neue Materialien gGmbH, Germany</td>
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<tr>
<td>10:45 AM</td>
<td>394</td>
<td><strong>Optimization of the Data Acquisition and Processing Using a Prior Knowledge of the Camera Characteristics: An EFTEM Case Study</strong>; G Lucas, C Hébert; Ecole Polytechnique Fédérale de Lausanne, Switzerland</td>
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<td>11:00 AM</td>
<td>395</td>
<td><strong>M&amp;M Student Awardee Monte Carlo Simulation and Experimental High-Angle Annular Dark Field Tomography</strong>; F Voisard, N Brodusch, H Demers, R Gauvin; McGill University, Canada</td>
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<td>11:15 AM</td>
<td>396</td>
<td><strong>The Phantom in the Noise and Validation of 3D EM Reconstructions</strong>; B Heymann; National Institutes of Health</td>
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<td>11:30 AM</td>
<td>397</td>
<td><strong>Advanced 3D Reconstruction Algorithms for Electron Tomography</strong>; T Sanders, I Arslan; Pacific Northwest National Lab; JD Roehling, BC Gates; University of California, Davis; J Batenburg; University of Antwerp, Belgium; P Binev; University of South Carolina</td>
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### 11:00 AM  345  Progress towards Accurate Quantitative Standardless X-ray Analysis at Low kV; PJ Statham; Oxford Instruments NanoAnalysis, United Kingdom


### 11:30 AM  347  Comparison of SEM-EDS and EPMA-WDS Analysis of Rare Earth Element Containing Minerals from Bokan Mountain, Alaska; HA Lowers, DB Stoeser; U.S. Geological Survey

### 11:45 AM  348  Standardless Analysis – Better but Still Risky; N Ritchie, DE Newbury; National Institute of Standards and Technology

### 11:45 AM  398  Compressed Sensing, Sparsity, and the Reliability of Tomographic Reconstructions; Y Jiang, R Hovden, DA Muller, V Elser; Cornell University

### BIOLOGICAL SCIENCES SYMPOSIA  WEDNESDAY MORNING

#### B05.03 Structural Biology and Ultrastructure

Session Chairs:
Michael Radermacher, University of Vermont; Paula da Fonseca, MRC Laboratory of Molecular Biology, United Kingdom; Ingeborg Schmidt-Krey, Georgia Institute of Technology; Caroline Miller, Indiana University

**Platform Session**
**Wednesday 10:30 AM • Room: 21**

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<th>Time</th>
<th>Session</th>
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<th>Authors</th>
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<tr>
<td>10:30 AM</td>
<td>630</td>
<td><strong>(Invited) Automated Procedures for the Alignment and Reconstruction of Multiple Tilt Electron Microscopic Tomography Data</strong>; MH Ellisman; University California, San Diego</td>
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<tr>
<td>11:00 AM</td>
<td>631</td>
<td><strong>M&amp;M Professional Technical Staff Award Giardia lamblia’s Ventral Disc Microtubules Transition Through as Many as Six Structurally Distinct Regions</strong>; CL Schwartz, JR Brown, JM Heumann, A Hoenger; University of Colorado; SC Dawson; University of California, Davis</td>
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<tr>
<td>11:15 AM</td>
<td>632</td>
<td>In situ FtsZ Mini-Ring Structure Revealed by TEM Tomography and STEM; CB Johnson, Z Long, AG Smith, Z Luo, S Vitha, A Holzenburg; Texas A&amp;M University</td>
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<tr>
<td>11:30 AM</td>
<td>633</td>
<td>BMP Signaling Regulates Extracellular Matrix Composition and Permeability in C. elegans; RD Schultz, TI Gumienny; Texas A&amp;M University Health Science Center; EA Ellis; Texas A&amp;M University</td>
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<tr>
<td>11:45 AM</td>
<td>634</td>
<td>New Method for Multiple Immunodetection on Resin Ultrathin Section in the Field Emission Scanning Electron Microscope; J Nebesářová; Biological Centre of ASCR, Czech Republic; P Wandrol; FEI, Czech Republic; M Vancová; Biological Centre of ASCR, Czech Republic</td>
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B09.01 Utilizing Microscopy for Research and Diagnosis of Diseases in Humans, Plants, and Animals

Session Chairs:
Jay Jerome, Vanderbilt University;
Patricia Kysar, University of California, Davis;

Platform Session
Wednesday 10:30 AM • Room: 16

10:30 AM 685 (Invited) Diagnosing Platelet Function Disorders by Electron Microscopy; WT Gunning III; University of Toledo Medical Center

11:00 AM 686 (Invited) Quantifying Changes in Nuclear Organization in Normal vs. Cancer Cells Using X-ray Tomography; EA Smith, MA Le Gros, CA Larabell; University of California, San Francisco; M Myllys; University of Jyväskylä, Finland

11:30 AM 687 (Invited) Electron Microscopy in the Analysis of Renal Biopsies: Always the Last Step?; DN Howell; Duke University

B10.02 Microscopy, Microanalysis and Image Analysis in the Pharmaceutical Sciences

Session Chairs:
Lynn DiMemmo, Bristol-Myers Squibb;
Alejandra Camacho, L’Oreal

Platform Session
Wednesday 10:30 AM • Room: 23

10:30 AM 706 Validation of a Digital Pathology Whole Slide Imaging System; BE Maleeff; GlaxoSmithKline

10:45 AM 707 From Discovery to Finished Products: Innovative Applications of Surface Mass Spectrometry in Pharmaceutical Industry; N Talaty, HH Gong, S Koeniger, A Vogt, M Pheil, P Fruehan, J Neilly, M Lopour, RW Johnson; AbbVie


11:30 AM 709 (Invited) Patent Litigation and the Power of Correlative Microscopy; SL Goodman; Microscopy Innovations LLC; JJ Edwards; Knobbe, Martens, Olson & Bear LLP

PHYSICAL SCIENCES SYMPOSIA
WEDNESDAY MORNING

P02.06 Advances in In situ Microscopy

Session Chairs:
David A. Muller, Cornell University;
Haimei Zheng, Lawrence Berkeley National Laboratory;
Adam P. Hitchcock, McMaster University, Canada;
Thomas LaGrange, Lawrence Livermore National Laboratory

Platform Session
Wednesday 10:30 AM • Marriott Ballroom C

10:30 AM 777 Fast Imaging of Carbon Nanotube Nucleation and Growth Processes using Environmental TEM; DN Zakharov, EA Stach; Brookhaven National Laboratory

10:45 AM 778 In situ Investigation of the Carbothermal Reduction of ZnO Nanowires; J Liu; Arizona State University; LF Allard; Oak Ridge National Laboratory

11:00 AM 779 Phase Transitions, Domains Walls and Defects Dynamics of LaAlO₃ via In situ Heating in the Transmission Electron Microscope; Q Mao, M Holtz, DG Schlom, DA Muller; Cornell University

11:15 AM 780 In situ TEM Investigation of Reduction-Oxidation Reactions During Densification of Iron Oxide Nanoparticles; CS Bonifacio, GK Das, IM Kennedy, K van Benthem; University of California, Davis

11:30 AM 781 Live Imaging of Reversible Domain Evolution in BaTiO₃ on the Nanometer Scale Using In situ STEM and TEM; A Schilling, JF Einsle, M Arredondo, M Gregg; Queen’s University Belfast; B Barton, JR Jinschek, L Mele, J Ringnalda, P Dona; FEI Company, Europe NanoPort, Netherlands

11:45 AM 782 The Design and Implementation of a Single, Double, and Triple Concurrent Beam In situ Ion Irradiation TEM Facility; D Bufford, K Hattar; Sandia National Laboratories, Albuquerque
Scientific Program

P05.02 Microanalysis of Irradiated Materials: Preparation, Instrumental Development, and Analysis

Session Chairs:
Karen E. Wright, Idaho National Laboratory;
Olivier Dugne, French Alternative Energies and Atomic Energy Commission;
Philipp Poeml, EC-JRC Institute for Transuranium Elements, Germany;
Adam Robinson, University of Cambridge, United Kingdom

Platform Session
Wednesday 10:30 AM • Room: 25

10:30 AM 904 (Invited) Microstructural Characterization of the Irradiated Nuclear Fuels; J Gan, BD Miller, DD Keiser, Jr., J-F Jue, AB Robinson, JW Madden, PG Medvedev, DM Wachs; Idaho National Laboratory

11:00 AM 905 The Focused Ion Beam-SEM as a Critical Tool For Nano-scale Characterization of Highly Radioactive Nuclear Fuels; JI Cole, A Aitkaliyeva, JW Madden, BD Miller; Idaho National Laboratory

11:15 AM 906 Spatial Distribution of Pd, Ag & U in the SiC Layer of an Irradiated TRISO Fuel Particle; TM Lillo, IJ van Rooyen; Idaho National Laboratory

11:30 AM 907 Multi-tier Analysis of SiC Breaches in Safety-Tested AGR-1 TRISO Fuel Particles; TJ Gerczak, JD Hunn, CA Baldwin, RN Morris, FC Montgomery, CM Silva; Oak Ridge National Laboratory; PA Demkowicz; Idaho National Laboratory

11:45 AM 908 Light Element Quantification in Irradiated Nanostructured Ferritic Alloys; MK Miller, Q Li, B Mazumder, CM Parish; Oak Ridge National Laboratory

11:00 AM 929 Improper Materials Selection in Motorcycle Stud Bolt Design; MA Hineman, FE Schmidt; Engineering Systems Inc.; BF Schmidt; Materials Engineering Inc.

11:15 AM 930 (Invited) Sliding Component Failure Due to Vibration Damage; LA Deibler, D Susan; Sandia National Laboratories

11:45 AM 931 Failure Investigation of WB-57 Aircraft Engine Cowling; JE Martinez; NASA Johnson Space Center

P06.02 Failure Analysis of Structural Materials: Microscopy, Metallography and Fractography

Session Chairs:
Daniel P. Dennies Exponent Inc.;
Ronald J. Parrington IMR Test Labs

Platform Session
Wednesday 10:30 AM • Room: 26

10:30 AM 928 (Invited) The Importance of Metallographic Etching for Failure Analysis of Metals; F Hogue; Hogue Metallography

10:30 AM 954 (Invited) Oxygen Exchange Kinetics of Thin Films Studied by Optical Transmission Relaxation: Correlation with Surface Composition and Microstructure; SR Bishop, L Zhao, T Diao, NH Perry, K Sasaki; Kyushu University, Japan

11:00 AM 955 Microstructural Investigations of Platinum Shape Equilibration in Alumina; M Gandman, R Gronsky, AM Glaeser; University of California, Berkeley; M Ridgway; Australian National University

11:30 AM 956 (Invited) Grain Boundary Engineering at the Interface of Ceramic and Composite Materials used in Alternative Energy Technologies; L Saraf, T Darroudi, O Dillon, G Wetzel; Clemson University; JJ Clarke; Hitachi High Technologies America, Inc.

P07.03 Microscopy and Characterization of Ceramics, Polymers, and Composites

Session Chairs:
S.K. Sundaram, Alfred University;
James E. Martinez, NASA Johnson Space Center

Platform Session
Wednesday 10:30 AM • Marriott Ballroom A

10:30 AM 953 (Invited) Oxygen Exchange Kinetics of Thin Films Studied by Optical Transmission Relaxation: Correlation with Surface Composition and Microstructure; SR Bishop, L Zhao, T Diao, NH Perry, K Sasaki; Kyushu University, Japan

11:00 AM 955 Microstructural Investigations of Platinum Shape Equilibration in Alumina; M Gandman, R Gronsky, AM Glaeser; University of California, Berkeley; M Ridgway; Australian National University

11:30 AM 956 (Invited) Grain Boundary Engineering at the Interface of Ceramic and Composite Materials used in Alternative Energy Technologies; L Saraf, T Darroudi, O Dillon, G Wetzel; Clemson University; JJ Clarke; Hitachi High Technologies America, Inc.

P09.05 Surface & Subsurface Microscopy & Microanalysis in Materials and Biological Systems

Session Chairs:
Vincent S. Smentkowski, General Electric;
John A. Chaney, The Aerospace Corporation;
Chanmin Su, Bruker-Nano, Inc.

Platform Session
Wednesday 10:30 AM • Marriott Ballroom D

10:30 AM 1039 (Invited) Mechanics of Biological Cells Studied with Atomic Force Microscopy; I Sokolow; M Dokukin; Tufts University
11:00 AM 1040 (Invited) Multimodal Chemical and Physical Surface Characterization on a Combined AFM-MS Platform; OS Ovchinnikova, GJ Van Berkel; Oak Ridge National Laboratory

11:30 AM 1041 Molecular Imaging of Self-Assembled Rosette Nanotubes by Scanning Tunneling Microscopy; J-Y Cho; National Institute for Nanotechnology, National Research Council, Canada; L Shuai, M El-Bakkari; University of Alberta; H Fenniri; Northeastern University

11:45 AM 1042 State of the Art Microanalysis Using Raman Microscopy; P Wang; Bruker optics Inc.

**TECH FORUM SYMPOSIA**
**WEDNESDAY MORNING**

**X30.02 Tech Forum Special Topics**
Session Chairs:
Lee Cohen-Gould, Cornell University;
Frank Macaluso, Albert Einstein College of Medicine

Platform Session
Wednesday 10:30 AM • Room: 27

10:30 AM 1064 (Invited) A Picture is Worth a Thousand Words but Quantitation is Worth a Thousand Micrographs; J Jerome; Vanderbilt University School of Medicine

11:00 AM 1065 (Invited) Live-cell Imaging Using Fluorescence Microscopy; VM DesMarais; Albert Einstein

11:30 AM 1066 (Invited) Measuring Protein Interactions Using Förster Resonance Energy Transfer and Fluorescence Lifetime Imaging Microscopy; RN Day; Indiana University

**BIOLOGICAL SCIENCES TUTORIAL**
**WEDNESDAY MORNING**

X51 Getting the Most from your Direct Detection (DD) Camera for Low-Dose TEM
Session Chair: Scott Stagg Florida State University
Platform Session
Wednesday 10:30 AM • Room: 13

10:30 AM 1071 Getting the Most out of Direct Detection Cameras for Low-Dose Transmission Electron Microscopy; A Cheng, J Pulokas, S Dallakyan, A Herold, CS Potter, B Carragher; The Scripps Research Institute
**TECH FORUM ROUNDTABLE**  
**WEDNESDAY AFTERNOON**

**X31.01 Tech Forum Roundtable**  
Session Chair:  
John Chandler, Colorado School of Mines  
Roundtable Session  
Wednesday 1:30 PM • Room: 27

1:30 PM  **1067** (Invited) Technologists’ Forum Roundtable Discussion: "Doing Great Science on a Tight Budget"; JP Chandler; Colorado School of Mines

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**ADVANCES IN INSTRUMENTATION SYMPOSIA**  
**WEDNESDAY AFTERNOON**

**A02.06 Advances in Imaging and Spectroscopy in STEM**  
Session Chairs:  
Nigel D. Browning, Pacific Northwest National Laboratory;  
Peter D. Nellist University of Oxford, United Kingdom;  
Maria Varela del Arco, Oak Ridge National Laboratory  
Platform Session  
Wednesday 1:30 PM • Room: 14

1:30 PM  **46** (Invited) Atomic Imaging and Spectroscopy of Two-dimensional Materials; JC Idrobo, W Zhou; Oak Ridge National Laboratory; M Kapetanakis, ST Pantelides; Vanderbilt University; MP Prange; Pacific Northwest National Laboratory; L Basile; Escuela Politecnica Nacional; SJ Pennycook; University of Tennessee, Knoxville

2:00 PM  **47** Imaging and Spectroscopy of Graphene/Hexagonal Boron Nitride Lateral Heterostructure Interfaces; L Basile; Escuela Politecnica Nacional; L Lei, G Gu; The University of Tennessee, Knoxville; J-C Idrobo; Oak Ridge National Laboratory

2:15 PM  **48** Monochromatic STEM-EELS for Correlating the Atomic Structure and Optical Properties of Two-Dimensional Materials; W Zhou, J-C Idrobo; Oak Ridge National Laboratory; N Dellyby, O Krivanek; Nion Co.; L Basile; Escuela Politecnica Nacional; T Aoki, J Mardinly, R Carpenter; Arizona State University; J Salafranca; Universidad Complutense de Madrid, Spain; S Pennycook; The University of Tennessee, Knoxville

2:30 PM  **49** MSA Eric Samuel Scholarship Interfaces and Defects in Hybrid Molecular Beam Epitaxy Grown NiTiO/SrTiO Heterostructures; JS Jeong, ML Odlyzko, P Xu, B Jalan, KA Mkhoyan; University of Minnesota

2:45 PM  **50** Absorption Corrections for a Four-Quarter SuperX EDS Detector; F Yang, F Scheltens, D McComb, DB Williams; The Ohio State University; M DeGraef; Carnegie Mellon University

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**A03.01 TEM Phase Contrast Imaging in Biological and Materials Science**  
Session Chair:  
Michael Marko, Wadsworth Center  
Platform Session  
Wednesday 1:30 PM • Room: 23

1:30 PM  **101** (Invited) Visualizing Virus Assembly Intermediates Inside Marine Cyanobacteria by Zernike Phase Contrast Electron Cryo-Tomography; W Chiu, W Dai, C Fu, J Flanagan, HA Khant, X Liu, RH Rochat, SJ Ludtke, MF Schmid; Baylor College of Medicine; D Raytcheva, C Haase-Pettingell, JA King; Massachusetts Institute of Technology; J Piret; Northeastern University; K Nagayama; National Institutes of Natural Sciences, Japan

2:00 PM  **102** (Invited) Zernike Phase Contrast Cryo-Electron Tomography of Bacteria and Viruses; ER Wright, RC Guerrero-Ferreira, G Kiss, JD Strauss, CM Hampton; Emory University

2:30 PM  **103** Automated Cryo-tomography and Single Particle Analysis with a New Type of Phase Plate; R Danev, Y Fukuda, J Plitzko, W Baumeister; Max Planck Institute of Biochemistry, Germany; B Buijsse; FEI Company, Netherlands

2:45 PM  **104** Phase Contrast Cryo-Electron Tomography of Primary Cultured Neuronal Cells; Y Fukuda, R Danev, S Asano, M Schaffer, F Beck, V Lučić, W Baumeister; Max Planck Institute of Biochemistry, Germany
Scientific Program

A05.01 15 Years of Focused Ion Beams at M&M
Session Chairs:
Lucille A. Giannuzzi, L.A. Giannuzzi and Associates;
Kena Scott, National Institute of Standards and Technology;
Nicholas Antoniou, Harvard University;
Platform Session
Wednesday 1:30 PM • Room: 17

1:30 PM 147 (Invited) FIB Applications: A Historical Perspective; F Stevie; North Carolina State University; L Giannuzzi; EXpressLO LLC

2:00 PM 148 Optimization of High Current Xenon Plasma Ion Beams for Applications in Semiconductor Failure Analysis and Development; S Subramaniam, K Johnson; Intel Corporation

2:15 PM 149 High Speed TEM Sample Preparation by Xe FIB; A Delobbe, O Salord, P Sudraud; Orsay Physics; T Hrncir, F Lopour; Tescan Brno s.r.o., Czech Republic; A David; Biophy Research, France

2:30 PM 150 He+ Ions for 3D Imaging; LA Giannuzzi; L.A. Giannuzzi & Associates LLC

2:45 PM 151 M&M Student Awardee Monte Carlo Modeling of Ion Beam Induced Secondary Electrons; U Huh, W Cho, D Joy; University of Tennessee, Knoxville; R Ramachandra; University of California, San Diego

A08.01 Nano-Characterization of Emerging Photovoltaic Materials and Devices
Session Chairs:
Robert F. Klie, University of Illinois at Chicago;
Moon Kim, University of Texas at Dallas
Platform Session
Wednesday 1:30 PM • Room: 15

1:30 PM 257 (Invited) Defect Physics in Photovoltaic Materials Revealed by Combined High-Resolution Microscopy and Density-Functional Theory Calculation; Y Yan, Y Wu, W Yin, Z Wang, NR Paudel; University of Toledo; C Li, J Poplawsky, T Pennycook; Oak Ridge National Laboratory; WK Metzger, I Repins, M Al-Jassim; National Renewable Energy Laboratory; S Pennycook; University of Tennessee

2:00 PM 258 Creating Single Boundary Between Two CdTe (111) Wafers with Controlled Orientation by Wafer Bonding; C Sun, N Lu, G Lian, J Wang, X Peng, MJ Kim; University of Texas, Dallas; RF Klie; University of Illinois, Chicago

2:15 PM 259 (Invited) Understanding Individual Defects in CdTe Solar Cells: From Atomic Structure to Electrical Activity; C Li, J Poplawsky, AR Lupini, MP Oxley; Oak Ridge National Laboratory; Y Wu, N Paudel, Y Yan; University of Toledo; TJ Pennycook; University of Oxford, United Kingdom; SJ Haigh; University of Manchester, United Kingdom; SJ Pennycook; University of Tennessee

2:45 PM 260 M&M Student Awardee High Resolution EELS Study of Ge$_{1-y}$Sn$_y$ and Ge$_{1-x-y}$Si$_x$Sn$_y$ Alloys; L Jiang, T Aoki, J Kouvetakis, J Menéndez; Arizona State University

A09.03 Nano-Characterization of Emerging Photovoltaic Materials and Devices
Session Chairs:
Gianluigi Botton, McMaster University, Canada;
Juan-Carlos, Idrobo Oak Ridge National Laboratory;
Ai Leen Koh, Standford University;
Paolo Longo, Gatan Inc.
Platform Session
Wednesday 1:30 PM • Room: 22

1:30 PM 286 (Invited) From Quantum Confinement to Quantum Electrodynamics using nanoCathodoluminescence in a STEM; M Kociak; Centre National de la Recherche Scientifique, France

2:00 PM 287 Tunable Plasmon and Optical Properties of Chalcopyrite Nanoplates Using Monochromated Electron Energy Loss Spectroscopy; JJ Cha; Yale University; K Koski; Brown University; K Huang, K Wang, D Kong, S Fan, ML Brongersma, Y Cui; Stanford University; W Luo; Shanghai Jiao Tong University; Z Yu; University of Wisconsin, Madison

2:15 PM 288 Attosecond Forces Imposed by Swift Electrons on Nanometer-Sized Metal Particles; MJ Lagos, PE Batson; Rutgers University; A Reyes-Coronaod; Benemérita Universidad Autónoma de Puebla, Mexico; PM Echenique, J Aizpurua; Donostia International Physics Center of Physics, Spain

2:30 PM 289 Electron Energy Loss Spectroscopy and Localized Cathodoluminescence Characterization of GaN Quantum Discs; REA Williams, SD Carnivale, TF Kent, RC Myers, DW McComb; The Ohio State University; DJ Stowe; Gatan, United Kingdom
Scientific Program

2:45 PM 290 Plasmons of Hexamer and Pentamer Nanocavities Probed with Swift Electrons; N Talebi, B Ögüt, W Sigle, PA Aken; Max Planck Institute for Intelligent Systems, Germany; R Vogelgesang; University of Oldenburg, Germany

A10.02 X-ray Imaging
Session Chairs:
Jeffrey M. Davis, National Institute of Standards and Technology;
Ric Wuhrer, University of Western Sydney, Australia;
Eric Telfeyan, U.S. Environmental Protection Agency

Platform Session
Wednesday 1:30 PM • Room: 12

1:30 PM 322 IUMAS-6 Early Career Scholar Mineral Analyses & Implications on the Dispersion of Bismuth in the Supergene Environment of Eastern Australia; TD Murphy, AJ Roper, S Hager, R Wuhrer, P Leverett, PA Williams; University of Western Sydney, Australia

1:45 PM 323 Investigation of Multiple, Large Area EDS Detectors on an SEM Capable of Various Mounting Geometries for Optimal EDS Analysis; D Edwards, D Guarrera, N Erdman, V Robertson; JEOL USA; N Rowlands, R McLaughlin; Oxford Instruments America, Inc.

2:00 PM 324 Characterization of Rare Earth Element Ores with High Spatial Resolution Scanning Electron Microscopy; C Teng; McGill University, Canada

2:15 PM 325 X-Ray Microanalysis with High Spatial Resolution and High Counts Rate with a State of the Art Field Emission Scanning Electron Microscope; R Gauvin, N Brodusch, H Demers; McGill University, Canada; P Woo; Hitachi High Technologies Canada Inc.

2:30 PM 326 (Invited) High-Speed, High-Resolution pnCCDs as Two-Dimensional Imaging Spectrometers for X-rays and Electrons; H Soltau, R Eckhardt, M Simson, J Soltau, C Thamm; PNDetector GmbH, Germany; R Hartmann, P Holl, S Ihle, H Ryll, M Huth, J Schmidt, L Strueder; PNSensor GmbH, Germany

A11.03 Frontiers of Electron-Probe Microanalysis
Session Chairs:
John Armstrong, Carnegie Institution for Science;
Paul Carpenter, Washington University in St. Louis;
Hideyuki Takahashi, JEOL Ltd., Japan;
Mike Jercinovic, University of Massachusetts Amherst

Platform Session
Wednesday 1:30 PM • Room: 24

1:30 PM 349 (Invited) Soft X-Ray EPMA Analyses of Extremely Reduced phases from Apollo 16 regolith: problems and solutions for sub-micron analysis; P Gopon, J Fournelle, P Sobol, M Spicuzza, J Valley; University of Wisconsin; P Pinard, S Richter; RWTH Aachen, Germany; X Llovet; University of Barcelona, Spain

2:00 PM 350 IUMAS-6 Early Career Scholar Towards Reliable Quantification of Steel Alloys at Low Voltage; PT Pinard, S Richter; RWTH Aachen, Germany; E Heikinheimo; Aalto University, Finland; X Llovet; University of Barcelona, Spain

2:15 PM 351 Quantitative X-ray Microanalysis of Low Atomic Number Elements by SEM/EDS-EDS with NIST DTSA II: Carbides and Nitrides and Oxides, Oh My!; DE Newbury, NWR Ritchie; National Institute of Standards and Technology

2:30 PM 352 Importance of Carbon Contamination in High-Resolution (FEG) EPMA of Silicate Minerals; B Buse, S Kearns; University of Bristol, United Kingdom

2:45 PM 353 Quantitative Analysis using Asymmetric Adaptive Pulse Processing; RB Mott, OE Healy; PulseTor LLC; NWM Ritchie, AP Lindstrom; National Institute of Standards and Technology

A13.02 Practical Applications and Analytical Trends of Metallography and Microstructure
Session Chairs:
Frauke Hogue Hogue Metallography;
Frank Mücklich Saarland University, Germany

Platform Session
Wednesday 1:30 PM • Marriott Ballroom B

1:30 PM 421 (Invited) Metallographic Techniques for Revealing the Microstructure of the Expanded Austenite Case on Surface-Hardened Corrosion-Resistant Alloys; SR Collins; Case Western Reserve University
Scientific Program

Wednesday     August 6

2:00 PM  **422 IUMAS-6 Early Career Scholar**  Microstructural Evolution of SS304 upon Various Shot Peening Treatments; Y He, K Li, K Shin; Changwon National University, South Korea; IS Cho, CS Lee, IG Park; Sunmoon University, South Korea

2:15 PM  **423 4D Characterization of Deformation Processes in Aluminum Foams: New Dimensions in Materials Engineering**; J Gelb; San José State University; A Gu, A Merkle, L Lavery; Carl Zeiss X-ray Microscopy, Inc.

2:30 PM  **424 Microstructure of the Muonionalusta Octahedrite Meteorite**; GF Vander Voort; Struers Inc.; FE Schmidt, Jr.; Engineering Systems Inc.

2:45 PM  **425 Confirming the Composition of Shape Memory Alloys by Microstructural Characterization**; DF Susan, TE Buchheit, JM Massad, JR McElhanon, M Reece; Sandia National Laboratories; A Garg, RD Noebe; NASA Glenn Research Center

**BIOLOGICAL SCIENCES SYMPOSIA**  
**WEDNESDAY AFTERNOON**

**B09.02 Utilizing Microscopy for Research and Diagnosis of Diseases in Humans, Plants, and Animals**

**Session Chairs:**  
Lois Anderson, Johns Hopkins University; Michael Goheen, Indiana University

**Platform Session**  
**Wednesday 1:30 PM • Room: 16**

1:30 PM  **688 (Invited) The Diagnostic Utility of Transmission Electron Microscopy in Contemporary Human Medicine: Experience at a University Hospital**; KM Weidenheim, GW Stephney; Montefiore Medical Center

2:00 PM  **689 Studies of the Interaction of Cardiac Lipid Droplets with Mitochondria Using Electron Microscopy**; JM Sotiris, J Strong, C Sztalryd, R-C Hsia; University of Maryland, Baltimore

2:15 PM  **690 (Invited) Fluorescent and Electronic Microscopy Analyses Revealed Critical Roles of C2cd3 in Centriolar Distal Appendage Assembly and Cilia Biogenesis**; X Ye, H Zeng, G Ning, A Liu; The Pennsylvania State University

2:45 PM  **691 Utilizing Quantitative Phase Microscopy to Observe Cellular Response to Treatment and Dynamic Behaviors**; K Creath, G Goldstein; 4D Technology Corp
PHYSICAL SCIENCES SYMPOSIA
WEDNESDAY AFTERNOON

P01.01 Analytical Techniques and Their Application for the Study of Deformed Microstructures

Session Chairs:
Michael B. Matthews, Atomic Weapons Establishment, United Kingdom;
Frederick Meisenkothen National Institute of Standards and Technology;
Stefan Zaefferer Max-Planck-Institut für Eisenforschung GmbH, Germany

Platform Session
Wednesday 1:30 PM • Room: 11

1:30 PM 723 (Invited) Changing the Paradigm for Engineering Design by Merging High Energy X-ray Data with Materials Modeling; PA Shade, JC Schuren, TJ Turner, DM Dimiduk; Air Force Research Laboratory; JV Bernier, SF Li, J Lind; Lawrence Livermore National Laboratory; B Blank; PulseRay; P Kenesei, J Almer; Argonne National Laboratory; U Lienert; DESY-Petra III, Germany; RM Suter; Carnegie Mellon University

2:00 PM 724 Precession Electron Diffraction Based TEM Studies of Microstructure Evolution in Severely Plastically Deformed Austenitic Stainless Steel; Y Idell, JMK Wiezorek; University of Pittsburgh

2:15 PM 725 (Invited) A Quantitative Assessment of Microtexture in Titanium Alloys Using Destructive and Nondestructive Methods; AL Pilchak, MA Groeber; Air Force Research Laboratory; J Li, G Sha, SI Rokhlin; The Ohio State University; JC Tucker; UES, Inc.

2:45 PM 726 Probing the Structure and Mechanical Properties of Individual MgAl2O4 Porous Agglomerates and Their Effects on Densification; JF Rufner, RHR Castro, K van Benthem; University of California, Davis; TB Holland; Colorado State University

P02.07 Advances in In situ Microscopy

Session Chairs:
David A. Muller Cornell University;
Haimei Zheng Lawrence Berkeley National Laboratory;
Adam P. Hitchcock McMaster University, Canada;
Thomas LaGrange Lawrence Livermore National Laboratory

Platform Session
Wednesday 1:30 PM • Marriott Ballroom C

1:30 PM 783 Operando TEM of Ru/RuO2 Catalyst Performing CO Oxidation; BK Miller, PA Crozier; Arizona State University

1:45 PM 784 Electron Microscopy Studies of Structure and Dynamics in MoS2-based Hydrodesulfurization Catalysts; LP Hansen, M Brorson, S Helveg; Haldor Topsøe A/S; E Johnson; Niels Bohr Institute; QM Ramasse; Super-STEM Laboratory; C Kisielowski; Lawrence Berkeley National Laboratory

2:00 PM 785 X-Ray Microscopy and Tomography of Hydrogen Storage Materials; J Gluch, S Niese; Technische Universität Dresden, Germany; I Röntzsch; Fraunhofer Institute for Manufacturing Technology and Advanced Materials, Germany; E Zshech; Fraunhofer Institute for Ceramic Technologies and Systems, Germany

2:15 PM 786 Atomic-Scale Imaging of Pt and Pd Nanoparticle Catalysts During CO Oxidation at 1 Bar Reaction Conditions; SB Vendelbo, CF Elkjær, S Helveg; Haldor Topsøe A/S; J Pusipitasa, FJF Creemer, B Morana, PJ Kooyman; Delft University of Technology, Netherlands; P Dona, L Mele; FEI Company, Netherlands; BJ Nelissen; Alremarle Catalyst Company BV, Netherlands; S Roobol; Leiden University; R van Rijn; Leiden Probe Microscopy BV, Netehrlands

2:30 PM 787 Controlled In situ Gas Reaction Studies of Catalysts at High Temperature and Pressure with Atomic Resolution; LF Allard, Z Wu, SH Overbury; Oak Ridge National Laboratory; WC Bigelow, S Zhang, X Pan; University of Michigan; B Carpenter, S Walden, RL Thomas, DS Gardiner, BW Jacobs, DP Nackashi, J Damiano; Protochips Inc.

2:45 PM 788 Stability of Supported Pd Nanoparticles During Exposure to Oxidizing and Reducing Environment; L Kovarik, Z Wei, B Arey, Y Li, J Szanyi, Y Wang, CHF Peden; Pacific Northwest National Laboratory; A Genc; FEI, Inc.; J-H Kwak; Ulsan National Institute of Science and Technology, South Korea
P05.03 Microanalysis of Irradiated Materials: Preparation, Instrumental Development, and Analysis

Session Chairs:
Karen E. Wright, Idaho National Laboratory;
Olivier Dugne, French Alternative Energies and Atomic Energy Commission;
Philipp Poeml, EC-JRC Institute for Transuranium Elements, Germany;
Adam Robinson, University of Cambridge, United Kingdom

Platform Session
Wednesday 1:30 PM • Room: 25

1:30 PM 909 (Invited) IUMAS-6 Early Career Scholar Quantification Of Actinides By EPMA: a New Accurate Standardless Approach; A Moy, C Merlet; GM, CNRS, Université de Montpellier, France; O Dugne; Commissariat à l'énergie atomique, France

2:00 PM 910 Micro-analytical Investigations on Actinide (Am, Cm) Reference Materials; X Ritter, P Pöml, S Brémier; EC-JRC Institute for Transuranium Elements, Germany; J Berndt; Westfälische Wilhelms-Universität Münster, Germany

2:15 PM 911 Shielded Field Emission EPMA for the Examination of Transversal and Axial Sections of Irradiated Fuel Rods; R Restani, R Grabbherr; Paul Scherrer Institut, Switzerland

2:30 PM 912 Transmission Electron Microscopy of 304-type Stainless Steel after Exposure to Neutron Flux and Irradiation Temperature Gradients; JMK Wiezorek; University of Pittsburgh; Y Huang; University of Oxford, United Kingdom; F Garner; Radiation Effects Consulting; PD Freyer; Westinghouse Electric Company LLC; M Sagisaka; Westinghouse Electric Japan Ltd; Y Isobe; Nuclear Fuels Industries Ltd, Japan; T Okita; The University of Tokyo, Japan

2:45 PM 913 High-Resolution Scanning Transmission Electron Microscopy Study of Black Spot Defects in Ion Irradiated Silicon Carbide; L He, Y Zhai, C Liu, C Jiang, IA Szulfaska, B Tylburska-Puschel, K Sridharan, PM Voyles; University of Wisconsin-Madison

P06.03 Failure Analysis of Structural Materials: Microscopy, Metallography and Fractography

Session Chairs: Daniel P. Dennie, Exponent Inc.;
Ronald J. Parrington, IMR Test Labs

Platform Session
Wednesday 1:30 PM • Room: 26

1:30 PM 932 (Invited) Investigation of Steel Lug Nut Failures with Brittle Fracture Characteristics; DF Susan, NR Sorensen, JR Michael, AC Kilgo, GL Clark II; Sandia National Laboratories

2:00 PM 933 Oxidation of Fe Whiskers and Surface Diffusion Observed by Environmental TEM; A Yoon; University of Illinois, Urbana-Champaign

2:15 PM 934 TEM Study of Supercritical Water Corrosion in 310S and 800H Alloys; B Shalchi Amirkhiz, J Li, Y Zeng, W Zheng; CanmetMATERIALS, Canada

2:30 PM 935 Embrittlement of Mild Steels During Hot Dip Galvanization; M Panzenboeck, P Schuetz; Montanuniversität Leoben, Austria

2:45 PM 936 Investigations of a Type 316L Steam Dryer Plate Material Suffering From IGSCC After a Few Years in BWR Conditions; J-M Autio, U Ehrnsten; VTT Technical Research Centre of Finland; R Mouginot; Aalto University, Finland; J Pakarinen; University of Wisconsin, Madison; M Cocco; Forsmark Kraftgrupp AB, Sweden
P07.04 Microscopy and Characterization of Ceramics, Polymers, and Composites

Session Chairs:  
S.K. Sundaram, Alfred University;  
James E. Martinez, NASA Johnson Space Center

Platform Session  
Wednesday 1:30 PM • Marriott Ballroom A

1:30 PM 957 High Resolution Electron Microscopy Characterization of (La$_{0.5}$Sr$_{0.5}$)$_2$CoO$_4$ Thin Film Cathode Materials; F Yang, D Williams, D McComb; The Ohio State University; Y Chen, Z Cai, N Tsvetkov, B Yildiz; Massachusetts Institute of Technology; M Burriel, J Kilner; Imperial College, United Kingdom; H Tellez; Kyushu University, Japan

1:45 PM 958 (Invited) The Role of Microscopy in Understanding Ceramic Processing; CB Carter; University of Connecticut

2:15 PM 959 Atomic Structure Determination of Ba$_4$Ti$_5$O$_{10}$ and Ba$_4$Ti$_4$O$_{11}$ in Epitaxial Barium Titanate Nanodomains Using HRTEM and Electron Diffraction; J He, J Jiang, EI Meletis; University of Texas at Arlington

2:30 PM 960 Direct Observation of Atomic Surface Structures of CeO$_2$ Nanoparticles; J Wen; Argonne National Lab; Y Lin, KR Poeppelemeier, LD Marks; Northwestern University; Z Wu; Oak Ridge National Lab

2:45 PM 961 Synthesis of Silver Doped TiO$_2$ Nanostructured Composites for Photocatalytic Applications; AK Al-Kamal, J Al-Sharab, H Halim, Z Dong, NZ Wohieb, BH Kear, SD Tse; Rutgers University

P09.06 Surface & Subsurface Microscopy & Microanalysis in Materials and Biological Systems

Session Chairs:  
Vincent S. Smentkowski, General Electric;  
John A. Chaney, The Aerospace Corporation;  
Chanmin Su, Bruker-Nano, Inc.

Platform Session  
Wednesday 1:30 PM • Marriott Ballroom D

1:30 PM 1043 (Invited) Characterization of Individual Nanoparticles with Nanoprojectile-SIMS; AB Clubb, EA Schweikert; Texas A&M University

2:00 PM 1044 (Invited) In-Situ TOF-SIMS and SFM Measurements Providing True 3D Chemical Characterization of Inorganic and Organic Nanostructures; E Niehuis, R Moellers, F Kollmer, H Arlinghaus; ION-TOF Technologies GmbH, Germany; HJ Hug, L Bernard, S Vranjkovic; EMPA Switzerland; R Dianoux, A Scheidemann; Nanoscan AG, Germany

2:30 PM 1045 (Invited) Improving Data Quality in Atom Probe Tomography; DJ Larson, TJ Prosa, DF Lawrence, SN Strennen, E Oltman, IY Martin, DA Reinhard, AD Giddings, DP Olson, JH Bunton, RM Ulfig, TF Kelly; CAMECA; JR Goodwin, RL Martens; University of Alabama

Family Affair

Session Chairs:  
Elaine Humphrey, University of British Columbia;  
Stuart McKernan, 3M

Education Session  
Wednesday 1:30 PM • Marriott Ballroom E
ADVANCES IN INSTRUMENTATION SYMPOSIA
WEDNESDAY AFTERNOON

A02.P2 Advances in Imaging and Spectroscopy in STEM

Poster Session
Wednesday 3:30 PM • Exhibit Hall AB

3:30 PM 70 M&M Post-Doctoral Researcher Awardee Putting a New Spin on Scanning Transmission Electron Microscopy; X Sang, E Grimley, C Niu, DL Irving, JM LeBeau; North Carolina State University
Poster # 248

3:30 PM 71 Sample Thickness Determination by Scanning Transmission Electron Microscopy at Low Electron Energies; T Volkenandt, E Müller, D Gerthsen; Karlsruhe Institute of Technology, Germany
Poster # 249

3:30 PM 72 Analytical ETL/EML Layer Investigation of Blue OLEDs; A Graff, F Altmann; Fraunhofer Institute for Mechanics of Materials; A Dzwilewski; Novaled GmbH, Germany; B Freitag; FEI Company, Netherlands
Poster # 250

3:30 PM 73 Channeling of Aberration-corrected STEM Probes at the "Sub-atomic" Scale; KA Mkhoyan, ML Odlyzko; University of Minnesota, Twin Cities
Poster # 251

3:30 PM 74 Quantitative Z-contrast Imaging in Scanning Transmission Electron Microscopy of Zeolite-supported Metal Clusters and Single-metal-atom Complexes With Single-Atom Sensitivity; P Xu, CM Macias, J Kistler, BC Gates; University of California, Davis; N Chotigkrai; Chulalongkorn University, Thailand; ND Browning; Pacific Northwest National Laboratory
Poster # 252

3:30 PM 75 Simulation of Decoherence in Fluctuation Electron Microscopy; A Rezikyan; Arizona State University
Poster # 253

3:30 PM 76 Accurate Measurement of Thermal Displacement in Filled Skutterudite by Scanning Transmission Electron Microscopy; L Wu, X Shi, Q Li, Y Zhu; Brookhaven National Laboratory
Poster # 254

3:30 PM 77 Including Thermal Vibrations and Bonding in HAADF-STEM Image Simulation; KA Mkhoyan, ML Odlyzko; University of Minnesota, Twin Cities
Poster # 255

3:30 PM 78 Investigation on Polarization Induced Electro-Optical Property of GaN LED using TEM-EBIC Combined with Cathodoluminescence; M-H Sheen, M Li, J-H Lee, Y-W Kim; Seoul National University, South Korea
Poster # 256

3:30 PM 79 In situ Atomic-Resolution Study of La$_{1-x}$Sr$_x$CoO$_3$ Using Z-contrast Imaging and EELS; A Gucek, RF Klie; University of Illinois, Chicago
Poster # 257

3:30 PM 80 Near Edge Fine Structure Analysis of Copper in Cu-Bi$_2$Se$_3$ Topological Insulators; G Subramanian, N Jiang, J Spence; Arizona State University
Poster # 258

3:30 PM 81 Direct Observation of the Polarity Control Mechanism in Aluminum Nitride Grown on Sapphire by Aberration Corrected Scanning Transmission Electron Microscopy; L Hussey, I Bryan, R Kirste, W Guo, Z Bryan, R Colazo, Z Sitar; North Carolina State University; S Mita; Hexatech Inc.
Poster # 259

3:30 PM 82 Atomic Structure of Thin MoSe$_2$ Films Grown by Molecular Beam Epitaxy; V Suresh, S Rouvimov, T Orlova, X Liu, JK Furdyna, D Jena, HG Xing; University of Notre Dame
Poster # 260

3:30 PM 83 Reconciling Theory and Experiment in High-resolution Electron Energy-loss Spectroscopy of Plasmon Modes in Individual Nanostructures; AA Herzing; National Institute of Standards and Technology; X Zhou, TB Norris; University of Michigan; A Horl, A Trugler, U Hohenester; Karl-Franzens-Universität Graz, Austria
Poster # 261

3:30 PM 84 Direct Observation of Asymmetric Sr Diffusion in Sr-δ-Doped La$_2$CuO$_4$; Y Wang, W Sigle, F Baiutti, G Gregori, G Logvenov, J Maier, PA van Aken; Max Planck Institute, Stuttgart, Germany
Poster # 262

3:30 PM 85 M&M Student Awardee Quantitative Study of Compositional Uniformity and Interfacial Strain in InAs/InAs$_{1-x}$Sb$_x$ Type-II Superlattices; J Lu, X-M Shen, Y-H Zhang, D Smith; Arizona State University
Poster # 263
Scientific Program

3:30 PM  86 STEM EBIC to Study 2D Materials; ER White, A Kerelsky, G Jasmin, WA Hubbard, BC Regan; University of California, Los Angeles; M Mecklenburg; University of Southern California

3:30 PM  87 TEM Investigations of Pt-NPs Loaded Fibrous Nanocatalyst Support KCC-1; DH Anjum, P Sarawade; King Abdullah University of Science & Technology, Saudi Arabia

3:30 PM  88 The In Situ TEM Study of Microstructure Alteration of MoS$_2$ under Carburization; J Chen; National Institute for Nanotechnology, Canada; Q Wei, J Chen; Natural Resources Canada

A06.P1 Super Resolution Microscopic Methods

Poster Session
Wednesday 3:30 PM • Exhibit Hall AB

3:30 PM  192 Experiments and Potentialities for the Use of Bessel Beam in Superresolution STEM; V Grillo, GC Gazzadi; CNR-Instituto Nanoscienze, Italy; E Karimi; University of Ottawa, Canada; R Balboni; CNR-Institute for Microelectronics and Microsystems, Bologna, Italy; S Frabboni, E Mafakheri; Università di Modena e Reggio Emilia, Italy; RW Boyd; University of Rochester

3:30 PM  193 The Use of Regularized Least Squares Minimization for the Deconvolution of SEM Images; E Lifshin, S Lyu, YR Kandel; University at Albany; RL Moore; RLM2 Analytical Services

3:30 PM  194 Live Cell Imaging With Spatial Light Modulator-based Optical Sectioning Structured Illumination Microscopy; Z Svindrych, P Krizek, E Smirnov, M Ovesny, J Borkovec, GM Hagen; Charles University in Prague, Czech Republic

3:30 PM  195 Crystallographic Structure Determination of MFI-Zeolite Nanosheets; P Kumar, M Tsapatsis, AK Mkhowyan; University of Minnesota

3:30 PM  196 High speed, high throughput two dimensional direct electron detector based on the concept of pnCCDs; L Strueder, J Schmidt, R Hartmann; PNSensor GmbH, Germany; J Soltau; PNDetector GmbH, Germany; M Huth, P Holl, G Lutz, H Ryll; PNSensor GmbH, Germany; H Soltau, M Simson; PNDetector GmbH, Germany

A09.P1 Frontiers in Analytical TEM-STEM

Poster Session
Wednesday 3:30 PM • Exhibit Hall AB

3:30 PM  302 Development of Two Steradian EDX System for the HD-2700 FE-STEM Equipped with Dual X-MaxN 100 TLE Large Area Windowless SDDs; T Hashimoto, K Tamura, H Inada, K Watanabe, Y Ohtsu, Y Suzuki, T Sato, T Kanemura, K Nakamura; Hitachi High-Technologies Corporation, Japan; S Burgess, J Holland, I Anderson; Oxford Instruments, United Kingdom; S Yamaguchi; Oxford Instruments KK, Japan

3:30 PM  303 Monochromator for Aberration-Corrected STEM; M Mukai, E Okunishi, M Ashino, K Omoto, T Fukuda, A Ikeda, K Somehara, T Kaneyama; JEOL Ltd., Japan; T Saitoh, T Hirayama; Japan Fine Ceramics Center; Y Ikuhara; The University of Tokyo, Japan

3:30 PM  304 Performance of an Improved TEM SDD Detector; HO Colijn, F Yang, DB Williams, DW McComb; The Ohio State University; A Sandborg; EDAX, Inc.

3:30 PM  305 Beam Damage During Energy-Dispersive X-ray Spectroscopy of FePt Nanoparticles; J Bentley; Oak Ridge National Laboratory;JE Wittig, JR McBride; Vanderbilt University

3:30 PM  306 A Comparison of Cross Section Formulas and their Effect on Calculated k-factors; AO Sandborg; Self Employed Consultant; P Camus, B Hammell; EDAX, Inc.

3:30 PM  307 Spatially Resolved In and As Distributions in InGaAs/GaP and InGaAs/GaAs Quantum Dot Systems; J Shen, JJ Cha, Y Song, ML Lee; Yale University
3:30 PM **308** Thermal Stability Study of Ni-Co Core-Shell Nanoparticles by *in situ* TEM; C Bonifacio, JC Yang; University of Pittsburgh; S Carenco, M Salmeron; Lawrence Berkeley National Laboratory

Poster # 278

3:30 PM **309** Comparison of Analysis Routines for EDS and EELS Spectrum Images of Electrical Contacts to Single-Walled Carbon Nanotubes; JD Sugar, AA Kane, AC Ford, MJ Rye, LM Lowery, F Leonard; Sandia National Laboratories

Poster # 279

3:30 PM **310** Monte Carlo Simulation of Electron Energy Loss Spectra of Group III-Nitride Nanoscale Semiconductors; M Attarian Shandiz, R Gauvin; McGill University, Canada; F Salvat; Universitat de Barcelona, Spain

Poster # 280

3:30 PM **311** STEM Tomography and Surface Plasmon Imaging of a Au-Pd Bi-metallic Nanorod with Exotic Morphology; Q Wang, Y Zhu, J Huang, Y Han; King Abdullah University of Science and Technology

Poster # 281

3:30 PM **312** Universal Scaling of Surface Plasmon Modes; FP Schmidt, F Hofer; Graz University of Technology, Austria; H Dillbacher, U Hohenester, A Hohenau, JR Krenn; Karl-Franzens-Universität Graz, Austria

Poster # 282

3:30 PM **313** TEM of Nanostructured Organic and Hybrid Materials for Photovoltaic and Battery Applications; J Chen; Oak Ridge National Laboratory

Poster # 283

3:30 PM **314** Angle-Resolved Valence EELS of a Single Crystal Gold Sample; M Malac, R Egerton; National Institute of Nanotechnology, Canada; K Kimoto; NIMS; P Shekhar, Z Jacob; University of Alberta; Y Taniguchi; Hitachi High-Technologies Corporation, Japan.; V Gaind; KLA-Tencore

Poster # 284

3:30 PM **315** Quantitative Structural Analysis of Nanoparticles Using Electron Pair Distribution Function (ePDF); H Hu, M Abeykoon, I Wu, Y Zhu, S Billinge; Brookhaven National Laboratory

Poster # 285

3:30 PM **316** Characterization of Metal-doped Mn$_3$O$_4$ Particles by Scanning Transmission Electron Microscopy and Electron Energy Loss Spectroscopy; J Park; Gumi Electronics & Information Technology Research Institute; HS Kim; Seoul National University

Poster # 286

3:30 PM **368** Analytical Multilayer Model Revisited for High Atomic Numbers at Low Voltage; C Merlet; Centre National de la Recherche Scientifique

Poster # 287

3:30 PM **369** Quantitative Microanalysis at Low Voltage with a WDS Electron Microprobe Equipped with a FE Column; AN Davis; CAMECA Instruments, Inc.; C Hombourger, M Outrequin; CAMECA, SAS, France

Poster # 288

3:30 PM **370** Mitigating Thermal Beam Damage with Metallic Coats in Low Voltage FEG-EPMA of Geological Materials; S Kearns, B Buse; University of Bristol, United Kingdom; J Wade; University of Oxford, United Kingdom

Poster # 289

3:30 PM **371** Development of an Automated Phase Analysis Procedure for Multi-Component Samples in EPMA; N Mori, N Kato, S Honda, S Sakamoto, M Takakura;JEOL, Ltd, Japan.; P McSwiggen; McSwiggen & Associates; C Nielsen; JEOL, Inc.

Poster # 290

3:30 PM **372** Overcoming Quantitative Challenges Presented By X-Ray Line Interferences in EDS and WDS; SM Seddio; Thermo Fisher Scientific

Poster # 291

3:30 PM **373** Optimizing the Dose for Energy Dispersive Electron Probe X-ray Microanalysis Measurements; N Ritchie; National Institute of Standards and Technology

Poster # 292

3:30 PM **374** Detecting Difficult Minor Elements in Particle Samples by SEM-EDS; AP Lindstrom, NWM Ritchie; National Institute of Standards and Technology

Poster # 293

3:30 PM **375** Quantitative Mapping of and Secondary Fluorescence Effects in Olivine Hosted Melt Inclusions; J Chouinard, J Donovan, E Aster, P Wallace; University of Oregon

Poster # 294
Scientific Program

3:30 PM 376 Image Analysis of 2D X-ray Intensity Maps: Element Abundances, Mineralogy, and Modal Analysis of Meteorites; DS Ebel; American Museum of Natural History; EJ Crapster-Pregont; Lamont-Doherty Earth Observatory; FM Jon; Fordham University
Poster # 295

3:30 PM 377 Morphology and Elemental Composition of Atmospheric Particles from Mexico Valley by Scanning Electron Microscopy; G Gonzalez, O Amador, BL Valle, GL Santos, AE Hernandez; Universidad Nacional Autónoma de Mexico
Poster # 296

3:30 PM 378 EPMA Studies on Reactions Between Ti and Al During Spark Plasma Sintering; Y Sun, M Aindow; University of Connecticut; K Kulkarni; Indian Institute of Technology, Kanpur; AK Sachdev; GM Global R&D Center; EJ Lavernia; University of California, Davis
Poster # 297

3:30 PM 379 Improving Analytical Efficiency of WD Spectrometers using Solid-State Detectors; D Lesher III; Advanced MicroBeam, Inc.
Poster # 298

3:30 PM 642 IUMAS-6 Early Career Scholar Investigation of Escherichia coli Selenocysteine Synthase (SelA) Complex Formation Using Cryo-Electron Microscopy (Cryo-EM); VHB Serrão, LR Manzine, I Rosa e Silva, OH Thiemann; University of São Paulo, Brazil; A Cassago, J Bettini, RV Portugal; Laboratório Nacional de Nanotecnologia CNPEM, Brazil; M van Heel; Leiden Universtiteit, Netherlands
Poster # 301

3:30 PM 643 Cryo-Electron Microscopic Study of the Enzymatic Mechanism of the RNA 2’-O-Methyltransferase Box C/D sRNP; WSV Yip, H Shigematsu, SJ Baserga; Yale University; DW Taylor; Howard Hughes Medical Institute; H-W Wang; Tsinghua University, China
Poster # 302

3:30 PM 644 Cantharidin an Active Compound of Blister Beetle Caused Mitochondrial Damage and Induced Apoptosis, Necrosis and Autophagy in Dalton’s Ascites Lymphoma in vivo; AK Verma, SB Prasad; North Eastern Hill University, India
Poster # 303

3:30 PM 645 High Throughput Multi Parameter TEM Chemical Processing Protocol Development with the mPrep-s Capsule System: Schmidtea mediterranea; M McClain; Stowers Institute for Medical Research
Poster # 304

3:30 PM 646 Structure and Development of the Attractive and Digestive Glands in the Carnivorous Pitcher Plant Nepenthes alata; TP Owen, Jr., A Carini, L Sutherland, C Hass, K Gabow; Connecticut College
Poster # 305

3:30 PM 647 Ultrastructure of Mitosis and Spindle Pole Bodies in the Zygomycetous Fungus Coemansia reversa Using Conventional Fixation and Freeze Substitution; RA Healy, GJ Celio, DJ McLaughlin; University of Minnesota; TKA Kumar; The Zamorin’s Guruvayurappan College, India; RW Roberson; Arizona State University
Poster # 306

3:30 PM 648 Identification of Isolated and in situ Freshwater Sponge Spicules of Eastern Tennessee; SC Kunigelis, JE Copeland; Lincoln Memorial University
Poster # 307

3:30 PM 649 Antiproliferative and Apoptotic Effects of Vanadyl Sulphate on H-Ras Transformed 3rp7 Cells; M Kutlu, D Vejselova; Anadolu University, Turkey
Poster # 309

BIOLOGICAL SCIENCES SYMPOSIA
WEDNESDAY AFTERNOON

B05.P1 Structural Biology and Ultrastructure

Poster Session
Wednesday 3:30 PM • Exhibit Hall AB

3:30 PM 640 Matching Anatomies - Correlating Pollen Tube Anatomy with Pistillar Geometry; Y Chebli, M Basilezadeh, A Geitmann; University of Montreal, Canada
Poster # 299

3:30 PM 641 A Comparative Study of the Sensory Structures Among Three Basal Hexapod Clades (Arthropoda: Collembola, Protura, Diplura) Using Scanning Electron Micrographs; RT Allen, AM Lawrence, RL Brown; Mississippi State University
Poster # 300
B09.P1 Utilizing Microscopy for Research and Diagnosis of Diseases in Humans, Plants, and Animals

Poster Session
Wednesday 3:30 PM • Exhibit Hall AB

3:30 PM 692 Architectural Niche Organization by LHX2 is Linked to Hair Follicle Stem Cell Function; HA Pasolli, A Rodriguez-Folgueras, E Fuchs; The Rockefeller University
Poster # 310

3:30 PM 693 Post-Renal Transplant Microsporidiosis; PE Kysar, S Barnhard, ER Lee, X Liu, R Ramsamoju; University of California, Davis
Poster # 311

3:30 PM 694 Halicephalobus Infection in a Fatal Case of Encephalomyelitis; CS Goldsmith, ML Eberhard, J Bhatnagar, C Drew; U.S. Centers for Disease Control and Prevention
Poster # 312

3:30 PM 695 The Enigma of the Pericardial Reaction in Rheumatic Heart Disease; S Siew; Michigan State University
Poster # 313

3:30 PM 696 (Invited) Histomorphometric and Immunohistochemical Analysis in the Uterus of Rats Treated with Genistein or Estrogen Immediately or Later After Castration; AAF Carbonel, JHRC Girão, LA Reis, CC Maganhn, MJ Simões; Universidade Federal de São Paulo, Brazil; RS Simões, EC Baracat, JM Soares, Jr.; Universidade de São Paulo, Brazil
Poster # 314

3:30 PM 697 (Invited) Pharmacological Preconditioning with Gentamicin (G) Attenuated the Toxicity in LLC-PK1 and Acute Kidney Injury in Rats; LA Reis; Universidade Federal de São Paulo, Brazil
Poster # 315

3:30 PM 698 Microwave and Vacuum Assisted Fixation and Cytochemical Localization for Lungs of Chicken, Gallus domesticus; E Ellis; Retired Biological Electron Microscopist
Poster # 316

3:30 PM 699 Photosynthetic Algae-Insulinoma Cell Fusion Creating Self-Sustaining Insulin Producer; D Heller, A Calabro, C Queenan, R Pergolizzi; Bergen County Academies
Poster # 317

3:30 PM 700 Melatonin Can Affect the CYP19 Immunoeexpression of Female Rat Ovary; CC Maganhn; Universidade Federal de São Paulo, Brazil; RS Simões; LFP Fuchs, EC Baracat, JM Soares, Jr.; University of São Paulo, Brazil; GRS Sasso, AAF Carbonel, ML Calio ML, LA Reis, MJ Simões; Universidade Federal de São Paulo, Brazil
Poster # 318

3:30 PM 701 3D Visualization of Motor-Neurons in Mice Spinal Cord Using FIB/SEM Tomography; B Deng, CM Freria, REA Williams, D Huber, J Sosa, PG Popovich, DW McComb; The Ohio State University
Poster # 319

3:30 PM 702 Effect of melatonin on ovarian function by overexpression and down-regulation of genes related to steroidogenesis in pinealectomized rats; CC Maganhn, JHRC Girão, GRS Sasso, AAF Carbonel, LA Reis; Universidade Federal de São Paulo, Brazil; RS Simões, LFP Fuchs, EC Baracat, JM Soares, Jr.; University of São Paulo, Brazil
Poster # 320

B10.P1 Microscopy, Microanalysis and Image Analysis in the Pharmaceutical Sciences

Poster Session
Wednesday 3:30 PM • Exhibit Hall AB

3:30 PM 710 Proper Sample Preparation for Characterization of Drug Delivery Carriers in TEM; H Qian; National Institute for Nanotechnology-NRC, Canada
Poster # 321

3:30 PM 711 Investigation and Analysis of Medical Device Contamination; Practical Applications of Light and Electron Microscopy; RS Brown; MVA Scientific
Poster # 322

3:30 PM 712 MSA Raleigh and Sara Miller Student Scholarship Multi-parametric Analysis of Intrinsic Cell Death Using Live Cell Microscopy; GN Joshi, DA Knecht; University of Connecticut
Poster # 323

3:30 PM 713 (Invited) Evaluation of estrogenic pathway genes in the vagina of rats treated with genistein or estrogen immediately or later after castration; AAF Carbonel, MA Santos, CC Maganhn, MJ Simões; Federal University of São Paulo, Brazil; RS Simões, EC Baracat, JM Soares, Jr.; University of São Paulo, Brazil; LA Reis; Federal University of São Paulo, Brazil; CRA Bertoncini; Federal University of São Paulo, Brazil
Poster # 324
Scientific Program

Wednesday August 6

3:30 PM 714 (Invited) Effects of Exosomes (EXOs) Derived by Renal Pluripotent Stem Cells (rPSCs) on the Cisplatin (Cis) Nephrotoxicity in Mice; LA Reis; Universidade Federal de São Paulo, Brazil

Poster # 325

PHYSICAL SCIENCES SYMPOSIA

P02.P3 Advances in In situ Microscopy

Poster Session
Wednesday 3:30 PM Exhibit Hall AB

3:30 PM 821 Fabrication and Healing of Faceted Nanopores in Magnesium; J Wang, H Sheng, C Liu, F Cao, Y Liu, H Zheng, D Zhao, J Wang; Wuhan University, China

Poster # 326

3:30 PM 822 Utilization of an ESEM™ with an Embedded Heating Stage to Investigate Pyrolysis in Immature Oil Shale; M Castagna, E Goergen, K Skinner; FEI Company; JE Dahl; Stanford University

Poster # 327

In situ

3:30 PM 823 In situ TEM Studies of Nanoparticle Self-Assembly: Imaging the Evolution of Pulsed-Laser-Induced Dewetting Processes; JT McKeown, T LaGrange, BW Reed, GH Campbell; Lawrence Livermore National Laboratory; Y Wu, PD Rack; University of Tennessee; JD Fowlkes; Oak Ridge National Laboratory

Poster # 328

3:30 PM 824 Dynamical TEM Investigation of Solidification Kinetics in AZ91 Mg Alloys; K Kruska, A Rohatgi, RS Vemuri, JE Evans, L Kovarik, P Abellan Baeza, LR Parent, I Mehdi, ND Browning; Pacific Northwest National Laboratory

Poster # 329

3:30 PM 825 Implementing In situ Experiments in Liquids in the (Scanning) Transmission Electron Microscope ((S)TEM) and Dynamic TEM (DTEM); P Abellan, RG Tonkyn, JE Evans, ND Browning; Pacific Northwest National Laboratory; TJ Woehl; U.S. DOE Ames Laboratory; WA Schroeder; University of Illinois, Chicago

Poster # 330

3:30 PM 826 A Dedicated In situ Off-Axis Holography (S)TEM: Concept and Electron-Optical Performance; F Börnert, H Lichte; Technische Universität Dresden, Germany; T Riedel, H Müller, M Linck; GEOS GmbH, Germany; B Büchner; Leibniz-Institut für Festkörper- und Werkstofforschung, Germany

Poster # 331

3:30 PM 827 Isotropic to Anisotropic Transition Observed in Si Nanoparticles Lithiation by In situ TEM; J Wu, L Luo, J Luo, J Huang, VP Dravid; Northwestern University

Poster # 332

In situ

3:30 PM 828 TEM In situ Electrical Testing of a FIB-prepared BaTiO₃ Ceramic Base Metal Electrode Capacitor; Z Lingley, T Ayvazian, J Theiss, M Brodie, B Foran; The Aerospace Corporation

Poster # 333

3:30 PM 829 Characterization of Sub-Nanometer Pt Cluster Formation On γ-Al₂O₃ via Ex Situ Reductions Using MEMS-Based Heating Technology; SI Sanchez, W Sinkler, SA Bradley; UOP LLC, a Honeywell Company; LF Allard; Oak Ridge National Laboratory

Poster # 334

3:30 PM 830 In situ Switching of a Ferroelectric Film Through a Non-Ferroelectric Layer and Direct Scanning Probe Analysis of the Same Cross Section; JR Jokisaari, P Gao, X Pan; University of Michigan

Poster # 335

3:30 PM 831 Electron Beam Induced Phase Transformation in Zinc Phosphat; K He, R Shahbazian Yassar; Michigan Technological University; X Zhang, YP Lu; Shandong University, China

Poster # 336

3:30 PM 832 Crystal Growth Mode Changes during Pulsed Laser Induced Rapid Solidification in Nanoscale Thin Films of Al-Cu Eutectic; KW Zweiacker, C Liu, JMK Wiezorek; University of Pittsburgh; BW Reed, T LaGrange, GH Campbell; Lawrence Livermore National Laboratory

Poster # 337

3:30 PM 833 (Invited) In situ Scanning Transmission Electron Microscopy Annealing Studies of Ni₁₋ₓCr Nanoclusters and Correlation with Magnetic Properties; RÉ Diaz, M Bohra, V Singh, M Sowwan; Okinawa Institute of Science and Technology, Japan

Poster # 338
P05.P1 Microanalysis of Irradiated Materials: Preparation, Instrumental Development, and Analysis

Poster Session
Wednesday 3:30 PM • Exhibit Hall AB

3:30 PM 914 Microstructural Analysis of Radiation Defect in Ion-irradiated Austenitic Stainless Steel using TEM and 3D-APT; H-H Jin, E Ko, S Lim, J Kwon; Korea Atomic Energy Research Institute, South Korea; B Lee; National Center for Nanomaterials Technology (NCNT)
Poster # 339

3:30 PM 915 Bubble Formation in Er and ErD2 During In situ He+ Ion Implantation; D Bufford, C Snow, K Hattar; Sandia National Laboratories
Poster # 340

3:30 PM 916 Morphology of Amorphous Pockets in SiC Irradiated with 1 MeV Kr Ions; X Wang, L Jamison, K Sridharan, PM Voyles, DD Morgan, I Szlafarska; University of Wisconsin-Madison
Poster # 341

3:30 PM 917 Model Materials for Irradiated Fuels: Study of Local Mechanical Behavior using Nanoindentation and Microstructural Analysis; N Payraudeau-Le Roux, S Meille, C Langlois, T Douillard; Institut national des sciences appliquées de Lyon, France; I Zacharie-Aubrun, J-M Gatt; CEA- Cadarache, France
Poster # 342

3:30 PM 918 New Analytical Developments for Uranium Based Powder; E Brackx, O Dugne, S Pages, N Tissot, E Remy; Commissariat à l'énergie atomique, France; R Podor; ICSM, France; M Lahaye; Plateforme Aquitaine de Caractérisation des Matériaux, France; M Cabie; Université d'Aix Marseille, France
Poster # 343

3:30 PM 919 A Comparison of Oxide Thickness Measurements of Uranium Dioxide and Tantalum Pentoxide Using Both User-Acquired and Built-In EDS Standards; C Poulter; AWE; C Lang; Oxford Instruments NanoAnalysis, United Kingdom
Poster # 344

3:30 PM 920 A New Methodology for Plutonium Homogeneity Level Determination in Sodium Fast Reactor Fresh Fuel From Uranium and Plutonium X-ray Mappings; L Aufore, J Lechelle; Commissariat à l'énergie atomique, France
Poster # 345

3:30 PM 921 Characterization of Phases Formed Between U-Pu-X Fuels and Fe-Based Cladding; A Aitkaliyeva, BD Miller, JW Madden, TP O'Holleran, JR Kennedy; Idaho National Laboratory
Poster # 346

3:30 PM 922 A Method for the Quantification of Total Xenon Concentration in Each Phase of MOX Irradiated Nuclear Fuel with SIMS and EPMA; K Hanifi, L Noirot, P Bienvenu, J Lamontagne, J Noirot, I Aubrun-Zacharie, C Pozo, I Roure, T Blay, P Delion, E Brochard; Commissariat à l'Energie Atomique et aux énergies alternatives, France
Poster # 347

3:30 PM 923 Acquisition of Micro-Mechanical Data on Irradiated Fuel; I Zacharie-Aubrun; CEA Cadarache, France; N Payraudeau-Le Roux, S Meille, C Langlois, T Douillard; Institut national des sciences appliquées de Lyon, France
Poster # 348

P07.P2 Microscopy and Characterization of Ceramics, Polymers, and Composites

Poster Session
Wednesday 3:30 PM • Exhibit Hall AB

3:30 PM 985 Material Study of High Performance Single Crystal Ferroelectric Nanowires; Y-W Yeh, S Xu, N Yao; Princeton University
Poster # 349

3:30 PM 986 Ferroelastic Domain Organization in Solution-Grown HfO2 Nanorods; Y Qin, SW Depner; State University of New York, Buffalo
Poster # 350

3:30 PM 987 Varying Phases of Alumina Nanowires Templated by Vertically Aligned Carbon Nanotubes Grown via Atomic Layer Deposition; S Smith, JF Conley, Jr.; Oregon State University; B Timonen, J Jiao; Portland State University
Poster # 351

3:30 PM 988 Effect of Atmosphere on Heat-Treated Electro-Spun TiO2 Fibers; MJ Arellano-Jimenez; Universidad Nacional Autonoma de Mexico; A Suresh, J McCutcheon, CB Carter; University of Connecticut; P Kotula; Sandia National Laboratory
Poster # 352
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Affiliations</th>
<th>Poster #</th>
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<td>3:30 PM</td>
<td>Heat Treatment of TiO&lt;sub&gt;2&lt;/sub&gt;/SiO&lt;sub&gt;2&lt;/sub&gt; Electrospun Ceramic Fibers</td>
<td>MT Janish, F Huang, A Suresh, CB Carter; University of Connecticut; KL Jungjohann; Sandia National Laboratories, Albuquerque; C Cornelius; University of Nebraska</td>
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<td>3:30 PM</td>
<td>Lithiation of Tin Nanoneedles Investigated by In situ TEM</td>
<td>MT Janish, CB Carter; University of Connecticut; DT Mackay, MG Norton; Washington State University; Y Liu, KL Jungjohann; Sandia National Laboratories, Albuquerque</td>
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<td>354</td>
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<td>3:30 PM</td>
<td>Synthesis of Highly Active Ruthenium Sulfide Hydrodesulfurization Catalysts: Effect of Hydrogen in the Activation Process</td>
<td>CE Ornelas; Centro de Investigación en Materiales Avanzados, Mexico</td>
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<td>355</td>
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<td>3:30 PM</td>
<td>Morphology and Chemical Composition of PM10 by SEM-EDS</td>
<td>R Ramirez-Leal, M Valle-Martinez, M Cruz-Campa; State University of Sonora</td>
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<td>356</td>
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<td>3:30 PM</td>
<td>Effect of Microstructure on Dielectric Breakdown in Amorphous HfO&lt;sub&gt;2&lt;/sub&gt; Films</td>
<td>SK Nandi, DJ Llewellyn, K Belay, DK Venkatachalam, X Liu, RG Elliman; Australian National University</td>
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<td>357</td>
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<td>3:30 PM</td>
<td>Anchoring Au Nanoparticles onto ZnO Nanowires by Heteroepitaxy</td>
<td>J Liu, J Liu; Arizona State University; Y Huang; Harbin Institute of Technology, China</td>
<td></td>
<td>358</td>
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<td>3:30 PM</td>
<td>Preparation of ZnO/Zn(OH)&lt;sub&gt;2&lt;/sub&gt; in Alkaline Medium Using Chemical Precipitation</td>
<td>G Herrera-Pérez, R Vargas-Bernal; Instituto Tecnológico Superior de Irapuato, Mexico</td>
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<td>359</td>
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<td>3:30 PM</td>
<td>Synthesis of Silicon Oxide Nanowires by Chemical Vapor Deposition</td>
<td>SN Berrier, M Bauer, C Li; Clarion University of Pennsylvania; D Li, V Solomon; Youngstown State University</td>
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<td>3:30 PM</td>
<td>Investigation of Local A-site Chemistry in Barium Strontium Titanate Using Aberration Corrected STEM, EELS and EDS</td>
<td>MJ Burch, J Li, X Sang, J LeBeau, J-P Maria, EC Dickey; North Carolina State University; L Garten, S Trolier-McKinstry; Pennsylvania State University</td>
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<td>3:30 PM</td>
<td>Microanalysis Species ZnO/Zn(OH)&lt;sub&gt;2&lt;/sub&gt;, Obtained by Chemical Precipitation</td>
<td>A Medina-Flores, L Béjar-Gómez; Universidad Michoacana de San Nicolás de Hidalgo, Mexico; G Herrera-Pérez; Instituto Tecnológico Superior de Irapuato, Mexico</td>
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<td>3:30 PM</td>
<td>Cathodoluminescence of Polymeric Materials</td>
<td>A Pakzad, S Nagy; Gatan Inc.; DJ Stowe; Gatan United Kingdom; JR Mantei, J-B Green; Baxter Healthcare</td>
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<td>363</td>
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Thursday, August 7, 2014

A02.07 Advances in Imaging and Spectroscopy in STEM

Session Chairs:
Nigel D. Browning, Pacific Northwest National Laboratory;
Peter D. Nellist, University of Oxford, United Kingdom;
Maria Varela del Arco, Oak Ridge National Laboratory

Platform Session
Thursday 8:30 AM • Room: 14

8:30 AM 51 (Invited) Grain Boundary Structure Reconstruction due to Vacancies and Dopants in Oxides; Y Ikuhara; The University of Tokyo, Japan

9:00 AM 52 Probing Atomic Scale Dynamics with STEM; T Pennycook; SuperSTEM Laboratory, United Kingdom; L Jones, PD Nellist; University of Oxford, United Kingdom; H Petterson, V Nicolosi; Trinity College Dublin, Ireland

9:15 AM 53 Atomic-Resolution Monitoring of Structural Phase Transition in Bi-magnetic Core/Shell Oxide Nanoparticles; MA Roldan, J Salafranca; Universidad Complutense de Madrid, Spain; R Ishikawa, M Varela; Oak Ridge National Laboratory; R Mishra; Vanderbilt University; A Lopez-Ortega; Università degli Studi di Firenze, Italy; M Estrader; Universitat de Barcelona, Spain; J Nogues; Institut Català de Nanociència i Nanotecnologia, Spain; SJ Penycott; The University of Tennessee

9:45 AM 55 Novel M1/M2 Heterostructure in Mo-V-M-Ta (M = Te or Sb) Complex Oxide Catalyst Revealed by aberration corrected HAADF STEM; Q He, A Borisevich; Oak Ridge National Laboratory; J Woo, VV Guliants; University of Cincinnati

A03.02 TEM Phase Contrast Imaging in Biological and Materials Science

Session Chair: Radostin Danev, Max Planck Institute of Biochemistry, Germany

Platform Session
Thursday 8:30 AM • Room: 23

8:30 AM 105 (Invited) Investigating the Causes of Electrostatic Charging of Phase Contrast Apertures; RM Glaser; Lawrence Berkeley National Laboratory

9:00 AM 106 Evaluation of the Quality of Zernike Phase Plates; M Marko, X Meng, C Hsieh, G Kishchenko, A Leith; Wadsworth Center

9:15 AM 107 (Invited) Application of Zach Phase Plates for Phase Contrast Transmission Electron Microscopy: Status and Future Experiments; S Hettler, J Wagner, M Dries, D Gerthsen; Karlsruhe Institute of Technology, Germany; M Oster, RR Schröder; University of Heidelberg, Germany

9:45 AM 108 Inelastic Phase Contrast Using Electrostatic Zach Phase Plates; S Hettler, J Wagner, M Dries, D Gerthsen; Karlsruher Institut für Technologie, Germany

A05.02 15 Years of Focused Ion Beams at M&M

Session Chairs:
Lucille A. Giannuzzi, L.A. Giannuzzi and Associates;
Keana Scott, National Institute of Standards and Technology;
Nicholas Antoniou, Harvard University

Platform Session
Thursday 8:30 AM • Room: 17

8:30 AM 152 (Invited) From Space Ion Thrusters to Nanotools; P Sudraud; Orsay-Physics, France

9:00 AM 153 Insulator Analysis Using Combined FIB-SEM instrument with TOF-SIMS; L Selič, J Kološová, J Jiruš; TESCAN Brno, s.r.o., Czech Republic; FA Stevie; North Carolina State University
Scientific Program

9:15 AM 154 Optimized Detection Limits in FIB-SIMS by Using Reactive Gas Flooding and High Performance Mass Spectrometers; T Wirtz, D Dowsett, P Philipp; Centre de Recherche Public - Gabriel Lippmann, Luxembourg

9:30 AM 155 M&M Student Awardee Ion-induced Auger Electron Spectroscopy as a Potential Route to Chemical Focused-Ion Beam Tomography; H Parvaneh, R Hull; Rensselaer Polytechnic Institute

9:45 AM 156 Advanced Ion Source Technology for High Resolution and Stable FIB Nanofabrication Employing Gallium and New Ion Species; S Bauerdick, P Mazarov, L Bruchhaus, R Jede; Raith GmbH, Germany; JE Sanabia, J Fridmann; Raith America Inc.

A08.02 Nano-Characterization of Emerging Photovoltaic Materials and Devices

Session Chairs:
Robert F. Klie, University of Illinois at Chicago;
Moon Kim, University of Texas at Dallas

Platform Session
Thursday 8:30 AM • Room: 15

8:30 AM 261 (Invited) Characterization of Poly-Crystalline CdTe Solar Cells Using Aberration-Corrected Transmission Electron Microscope; E Colegrove, C Buurma, RF Klie; University of Illinois, Chicago; M Kim; University of Texas, Dallas

9:00 AM 262 Atomic Scale Studies of Structure and Bonding in AlP(i), Alloys Grown Lattice-Matched on Si(001); T Aoki, L Jiang, AVG Chizmeshya, J Menéndez, J Kouvetakis, DJ Smith; Arizona State University

9:15 AM 263 Compositional and Structural Analysis of Al-Doped ZnO Multilayers by LEAP; AD Giddings, TJ Prosa, DJ Larson; CAMECA Instruments Inc.; Y Wu, MA Verheijen, F Roozeboom, EWMK Kessels; Eindhoven University of Technology, Netherlands

9:30 AM 264 (Invited) Density Functional Theory Modeling of Twin Boundaries in CdTe as Informed by STEM Observations; C Buurma, T Paulauskas, Z Guo, R Klie; University of Illinois at Chicago; MKY Chan; Argonne National Laboratory

A09.04 Frontiers in Analytical TEM-STEM

Session Chairs:
Gianluigi Botton, McMaster University, Canada;
Juan-Carlos Idrobo, Oak Ridge National Laboratory;
Ai Leen Koh, Standford University;
Paolo Longo, Gatan Inc.

Platform Session
Thursday 8:30 AM • Room: 22

8:30 AM 291 (Invited) EELS and EFTEM Analysis of Biological Materials; RD Leapman, MA Aronova; National Institutes of Health

9:00 AM 292 M&M Post-Doctoral Researcher Awardee Optical Sectioning with Atomic Resolution Spectroscopy; TJ Pennycook; SuperSTEM; L Jones, P Nellist; University of Oxford, United Kingdom; M Cabero, A Ribera-Calzada, C Leon, J Santamaria; Universidad Complutense de Madrid, Spain; M Varela; Oak Ridge National Laboratory

9:15 AM 293 Atomic Column Elemental Mapping by STEM-Moiré Method; E Okunishi, N Endo, Y Kondo; JEOL Ltd., Japan

9:30 AM 294 Observing Plasmon Damping Effects of Metallic Adhesion Layers in E-Beam Synthesized Nanostructures Using STEM-EELS and Raman Spectroscopy; SJ Madsen, PJ Kempen, R Sinclair; Stanford University

9:45 AM 295 High Resolution Optical and Vibrational Spectroscopy with Low Loss EELS; P Cueva, DA Muller; Cornell University

A10.03 X-ray Imaging

Session Chairs:
Jeffrey M. Davis, National Institute of Standards and Technology;
Ric Wuhrer, University of Western Sydney, Australia;
Eric Telfeyan, U.S. Environmental Protection Agency

Platform Session
Thursday 8:30 AM • Room: 12

8:30 AM 327 Interactive Analysis of Terabyte-sized SEM-EDS Hyperspectral Images; A Vandecreme, P Bajcsy, NWM Ritchie, JHJ Scott; National Institute of Standards and Technology

9:00 AM 328 Support Vector Machines for Classification and Quantitative Analysis; JM Davis; National Institute of Standards and Technology
A13.03 Practical Applications and Analytical Trends of Metallography and Microstructure

Session Chairs:
Frauke Hogue Hogue Metallography;
Frank Mücklich Saarland University, Germany

Platform Session
Thursday 8:30 AM • Marriott Ballroom B

8:30 AM 426 (Invited) EBSD Analysis for Microstructure Characterization of Zr-based Bulk Metallic Glass Composites; JA Booth, J Carter, J Lewandowski; Case Western Reserve University

9:00 AM 427 Thickness-Dependent Beam Broadening in Transmission EBSD; KP Rice, RR Keller; National Institute of Standards and Technology

9:15 AM 428 Advances in Scattered Electron Intensity Distribution Imaging for Microstructural Visualization and Correlations with EBSD Measurements; MM Nowell, SI Wright, T Rampton; EDAX Inc.; R de Kloe; EDAX B.V., Netherlands

9:30 AM 429 Exploitation of Contrasts in Low Energy SEM to Reveal True Microstructure; I Müllerová, Š Mikmeková, E Mikmeková, Z Pokorná, I Frank; Institute of Scientific Instruments ASCR, Czech Republic

9:45 AM 430 Characterization of the Surface Layer of Ag/W Electrical Contacts; H Yu, Y Sun, P Alpay, M Aindow; University of Connecticut

A14.01 Advances in Cathodoluminescence and Soft X-ray Microanalysis

Session Chairs:
Colin M. MacRae, CSIRO-Minerals, Australia;
Marion A. Stevens-Kalceff, University of New South Wales, Australia;
Scott A. Wight National Institute of Standards and Technology

Platform Session
Thursday 8:30 AM • Room: 16

8:30 AM 448 (Invited) Valence Electron State of Carbon Materials Studied by TEM-SXES; M Terauchi; Tohoku University, Japan
Scientific Program

8:45 AM 449 (Invited) Development of Soft X-ray Microanalysis Using Windowless SDD Technology; S Burgess, X Li, J Holland, P Statham, S Bhadare, D Birtwistle, A Prothee; Oxford Instruments, United Kingdom

9:00 AM 450 Using Accurate Solid Angle Tools When Comparing EDS Detector Geometries; PP Camus; EDAX Inc.; R Buchhold; Werth Messtechnik GmbH, Germany

9:15 AM 451 Mapping of Weak Cathodoluminescence Signals; NC Wilson, CM MacRae, A Torpy; CSIRO, Australia

BIOLOGICAL SCIENCES SYMPOSIA
THURSDAY MORNING

B04.01 Advances in Sample Preparation for Cryo-EM Studies
Session Chairs:
Isabelle Rouiller McGill University, Canada; Howard Young University of Alberta, Canada

Platform Session
Thursday 8:30 AM • Room: 25

8:30 AM 604 (Invited) Cryo-Electron Microscopy of Potassium Channel Membrane Proteins; J Kowal, S Scherer, K Sejwal, M Chami, P Baumgartner, H Stahlberg; University of Basel, Switzerland; M Rangl, S Scheuring; Aix-Marseille Université, France; GF Schröder; Forschungszentrum Jülich, Germany; C Nimigean; Weill Cornell Medical College

9:00 AM 605 (Invited) One and Two Dimensional Arrays of Membrane Proteins Stabilized by Amphipol; W Arunmanee, R Harris, JH Lakey; Newcastle University, United Kingdom

9:30 AM 606 (Invited) Two-Dimensional Crystallization of Membrane Proteins: Screening Strategies; N Coudray, R Lasala, Z Zhang, D Stokes; New York Structural Biology Center; Z Zolnai; University of Wisconsin, Madison; I Ubarretxena; Mt. Sinai School of Medicine

PHYSICAL SCIENCES SYMPOSIA
THURSDAY MORNING

P01.02 Analytical Techniques and Their Application for the Study of Deformed Microstructures
Session Chairs:
Michael B. Matthews Atomic Weapons Establishment UK; Frederick Meisenkothen National Institute of Standards and Technology; Stefan Zaefrerer Max-Planck-Institut für Eisenforschung GmbH, Germany

Platform Session
Thursday 8:30 AM • Room: 11

8:30 AM 727 IUMAS-6 Early Career Scholar Electron Channeling Contrast Observations in Deformed Magnesium Alloys; S Kaboli, H Demers, N Brodusch, R Gauvin; McGill University, Canada

9:00 AM 728 Application of Precession Electron Diffraction in Deformation Studies of Advanced Non-Ferrous Structural Alloys; I Ghamarian, Y Liu, P Collins; University of North Texas

9:15 AM 729 Analyzing Dislocations with Virtual Dark Field Images Reconstructed from Electron Diffraction Patterns; EF Rauch, M Véron; CNRS-Grenoble, France

9:30 AM 730 Magnetic Domain Structure and Crystal Orientation Revealed by a Forescatter Detector and Electron Backscatter Diffraction; M Gallaugher, N Brodusch, R Gauvin, RR Chromik; McGill University, Canada

9:45 AM 731 Strength and Plasticity of H- and Oxide- Terminated Cubic Si Nanocrystals; AJ Wagner, ED Hintsala, UR Kortshagen, WW Gerberich, KA Mkhoyan; University of Minnesota
Scientific Program

P02.08 Advances in In situ Microscopy

Session Chairs:
David A. Muller Cornell University;
Haimei Zheng Lawrence Berkeley National Laboratory;
AdAM P. Hitchcock McMaster University, Canada;
Thomas LaGrange Lawrence Livermore National Laboratory

Platform Session
Thursday 8:30 AM • Marriott Ballroom C

8:30 AM 789 (Invited) Phase Transitions in Nanomaterials using Movie Mode Dynamic Transmission Electron Microscopy; BW Reed, T LaGrange, JT McKeown, MK Santala, GH Campbell; Lawrence Livermore National Laboratory; KJ Koski; Brown University

9:00 AM 790 In situ Lorentz Microscopy with Femtosecond Optical Illumination; J-G Gatzmann, T Eggebrecht, A Feist, V Zbarsky, M Münzenberg, C Ropers, S Schäfer; Georg-August-Universität Göttingen, Germany

9:15 AM 791 Rapid Solidification in Thin-Film Al-Cu Alloys: Capturing the Dynamics with Time-Resolved In situ TEM; JT McKeown, T LaGrange, BW Reed, GH Campbell; Lawrence Livermore National Laboratory; K Zweiecker, C Liu; JMK Wiezorek; University of Pittsburgh

9:30 AM 792 Capturing Dynamics of Pulsed Laser Induced Melting and Rapid Solidification in Aluminium Polycrystals with Nanoscale Temporal Resolution In situ TEM; JMK Wiezorek, KW Zweiecker, C Liu; University of Pittsburgh; JT McKeown, T LaGrange, BW Reed, GH Campbell; Lawrence Livermore National Laboratory

9:45 AM 793 Imaging Unsteady Propagation of Reaction Fronts in Reactive Multilayer Fizzy with Multi-Frame Dynamic TEM; MK Santala, BW Reed, T LaGrange, GH Campbell; Lawrence Livermore National Laboratory; MD Grapes, TP Weihs; The Johns Hopkins University

9:00 AM 963 Multilayered Cr(Al)N/SiO₂ Nanocomposite Coatings Fabricated by Differential Pumping Coatering; M Kawasaki; JEOL USA Inc.; M Nose; University of Toyama, Japan; I Onishi; JEOL Ltd., Japan; M Shiojiri; Kyoto Institute of Technology, Japan

9:15 AM 964 Oxygen Vacancies at Grain Boundaries in Doubly-Doped Ceria Determined using EELS; WJ Bowman, J Zhu, Z Hussaini, PA Crozier; Arizona State University

9:30 AM 965 Anti-Polar Ordering in Polycrystalline Samarium Doped BiFeO₃; A Bencan, J Walker, T Rojac, B Malic; Jozef Stefan Institute, Slovenia; G Drazic; National Institute of Chemistry, Slovenia

9:45 AM 966 Characterization of Tetragonal-Monoclinic, Ferroelastic Transformation and Domain Boundaries in Zirconia-Authenticated Yttrium Tantulate; M Baram; McMaster University, Canada; S Shian, M Gurak, J Feng, DR Clarke; Harvard University; P Sarin; Oklahoma State University; WM Kriven; University of Illinois, Urbana-Champaign

P09.07 Surface & Subsurface Microscopy & Microanalysis in Materials and Biological Systems

Session Chairs:
Vincent S. Smentkowski, General Electric;
John A. Chaney, The Aerospace Corporation;
Chanmin Su, Bruker-Nano, Inc.

Platform Session
Thursday 8:30 AM • Marriott Ballroom D

8:30 AM 1046 (Invited) Revealing the Dopant Incorporation Mechanisms into Vapor-Liquid-Solid Grown NWs Employing Nano-Prop Scanning Auger Microscopy; U Givan, S Christian; Helmhotz-Zentrum-Berlin; DF Paul, JS Hammond; Physical Electronics Inc.; Y Rosenwaks; Tel-Aviv University, Israel; LJ Lauhon; Northwestern University

9:00 AM 1047 (Invited) Thermo-Oxidative Stability of SiO₂-doped Diamondlike Carbon Studied via Environmental XPS and AFM; RW Carpick, F Mangolini, J Hilbert, JR Lukes; University of Pennsylvania

9:30 AM 1048 (Invited) The Use of Argon Cluster Ion Sources in Etching of Inorganic Materials with Reduced Chemical Damage: Toward a Better Understanding of Interface Chemistry; C Moffitt, D Surman; Kratos Analytical, Inc.; J Counsell; Kratos Analytical, Ltd., United Kingdom

P07.05 Microscopy and Characterization of Ceramics, Polymers, and Composites

Session Chairs: S.K. Sundaram, Alfred University; James E. Martinez, NASA Johnson Space Center

Platform Session
Thursday 8:30 AM • Marriott Ballroom A

8:30 AM 962 (Invited) High Speed SPM for Novel Property Mapping of Functional Ceramics; V Vyas, BD Huey, V Palumbo, J Bosse, Y Kutes, L Ye, M Rivas; University of Connecticut
Advances in Instrumentation Symposia
Thursday Morning

A02.P3 Advances in Imaging and Spectroscopy in STEM

Poster Session
Thursday 10:30 AM • Exhibit Hall AB

10:30 AM 89 Understanding the Growth Mechanism of CeO$_2$ Nanocrystals by Comparison of Experimental and Simulated HAADF-STEM Images; W Weng; IBM; MAL Cordeiro, ER Leite; Federal University of Sao Carlos, Brazil; DG Stroppa; Brazilian Synchrotron Light Laboratory; CJ Kiely; Lehigh University

Poster # 364

10:30 AM 90 In situ HAADF-STEM Imaging and Tomography of AuIr Bimetallic Catalysts; CW Han, EE Marinero, V Ortalan; Purdue University; A Aguilar, R Zanella; Universidad Nacional Autónoma de Mexico

Poster # 365

10:30 AM 91 Linking Performance with Particle Configuration on Bimetallic Pt/Co/MWCNT Catalysts for Aqueous Phase Reforming by Aberration Corrected STEM coupled with EELS; C Akatay, P Dietrich, F Sollberger, N Delgass, F Ribeiro; Purdue University; J Miller; Argonne National Laboratory; E Stach; Brookhaven National Laboratory

Poster # 366

10:30 AM 92 Understanding B-Site Disorder in HAADF-STEM Images of Double Perovskite Thin Films Using the Quantum Excitation of Phonons Model; BD Esser, M Dixit, REA Williams, HL Fraser, DW McComb; The Ohio State University; AJ D’Alfonso, LJ Allen; The University of Melbourne, Australia

Poster # 367

10:30 AM 93 The Outward Diffusion of Sb during Nanowire Growth Studied by Quantitative High-Angle Annular Dark Field Scanning Transmission Electron Microscopy; H Kauko, M Munshi, B-O Finland, ATJ van Helvoort; Norwegian University of Science and Technology; T Grieb, K Muller, A Rosenauer; Universität Bremen, Germany

Poster # 368


Poster # 369

10:30 AM 95 STEM/EELS Analysis of Conversion Reactions in Cycled FeOF/C; M Sina, N Pereira, GG Amatucci, F Cosandey; Rutgers University

Poster # 370

10:30 AM 96 Study of Novel AuCu-Pt Trivalent Multiply Twinned Nanoparticles with High Index Surfaces; S Khanal, N Bhattacharai, JJ Velazquez-Salazar, M Jose-Yacaman; University of Texas, San Antonio

Poster # 371

10:30 AM 97 Atomic Resolution Study of the Bonding Between ZnO Nanowires; J Xu, J Liu; Arizona State University

Poster # 372

10:30 AM 98 Unexpected Bismuth Concentration Profiles in MOVPE GaAs$_{1-x}$Bi$_x$ Films Revealed by HAADF STEM Imaging; AW Wood, Y Guan, K Forghani, LJ Mawst, TF Kuech, SE Babcock; University of Wisconsin, Madison

Poster # 373

10:30 AM 99 New Insights into the Structure of PtPd Bimetallic Nanoparticles and Their Atomic Resolution Images by Cs-Corrected STEM; S Khanal, N Bhattacharai, G Casillas, JJ Velazquez-Salazar, M Jose-Yacaman; University of Texas, San Antonio

Poster # 374

10:30 AM 100 Improved Temperature Determination from Plasmon Energy Shifts in Aluminum; M Mecklenburg, R Dhall, S Cronin; University of Southern California; S Aloni; Lawrence Berkeley National Laboratory; E White, W Hubbard, B Regan; University of California, Los Angeles

Poster # 375

A03.P1 TEM Phase Contrast Imaging in Biological and Materials Science

Poster Session
Thursday 10:30 AM • Exhibit Hall AB

10:30 AM 116 (Invited) Phase Contrast Cryo-Electron Tomography and Single Particle Analysis with a New Phase Plate; M Khoshouei, R Danev, G Gerisch, M Ecke, J Plitzko, W Baumeister; Max Planck Institute of Biochemistry, Germany

Poster # 376
10:30 AM  117 Artifact Correction for Zernike Phase-Plate Cryo-Electron Tomography; H Sui, G Kishchenko, J He, R Fisher, C Hsieh, M Marko; Wadsworth Center; R Danev; Max-Planck-Institute for Biochemistry, Germany

10:30 AM  118 A Nanocrystalline Hilbert Phase Plate for Phase Contrast Transmission Electron Microscopy; M Dries, S Hettler, B Gamm, E Müller, W Send, D Gerthsen; Karlsruher Institut für Technologie, Germany; K Müller, A Rosenauer; Universität Bremen, Germany

10:30 AM  119 CIGS Nanoparticles Observed in TEM Low Dose Condition; Atomic Resolution and Beam Effects; II Santana Garcia, P Specht, HA Calderon; Instituto Politécnico Nacional, Mexico; C Kisielowski; Lawrence Berkeley National Laboratory

10:30 AM  120 Dual Lens Electron Holography for High Spatial Resolution Junction and Strain Mapping of Semiconductor Devices; Y-Y Wang, J Bruley; IBM

10:30 AM  121 SAED and HREM Studies of Zr$_2$Co$_{11}$ Intermetallic Compound; X-Z Li, W-Y Zhang, DJ Sellmyer; University of Nebraska

A05.P1  15 Years of Focused Ion Beams at M&M

Poster Session
Thursday 10:30 AM • Exhibit Hall AB

10:30 AM  168 Focused Helium Ion Beam Nanomachining of Thin Membranes vs. Bulk Substrates; EM Mutunga, S Lockerman, KL Klein; University of the District of Columbia; S Tan, R Livengood; Intel Corporation; AE Vladar; National Institute of Standards and Technology

10:30 AM  169 Advantages of Helium and Neon Ion Beams for Intelligent Imaging; H Wu, SM Mcvey, D Ferranti, C Huynh, J Notte, L Stern, B Goetz; Carl Zeiss Microscopy, LLC; MS Joens, JAJ Fitzpatrick; Salk Institute for Biological Studies

10:30 AM  170 Ex situ Lift Out of PFIB Prepared TEM Specimens; LA Giannuzzi; EXpressLO LLC; NS Smith; Oregon Physics, LLC

10:30 AM  171 In situ Quantification of TEM Lamella Thickness and Ga Implantation in the FIB; M Hiscock, M Dawson, C Lang, C Hartfield, P J Statham; Oxford Instruments NanoAnalysis, United Kingdom

10:30 AM  172 Site Specific TEM Specimen Preparation for Characterization of Extended Defects in 4H-SiC Epiayers; M Abadier, YN Picard, M Skowronski; Carnegie Mellon University; RL Myers-Ward, KD Gaskill, CR Eddy, Jr.; U.S. Naval Research Laboratory; H Song, TS Sudarshan; University of South Carolina

10:30 AM  173 Ga+ FIB Milling and Measurement of FIB Damage in Sapphire; BB Van Leer, H Cheng, J Riesterer; FEI Company

10:30 AM  174 Blunted Tungsten Tip Cleaning by Nitrogen Gas Etching at Room Temperature without Tip Heating and Cooling; I-Y Park, T Ogawa, B Cho, C Han, JH Kim, SJ Ahn; Korea Research Institute of Standards and Science, South Korea

10:30 AM  175 A Focused Ion Beam Preparation Method to Minimize Gallium Ion Concentration in Copper Atom-Probe Tomography Specimen Tips; RP Kolli; University of Maryland; F Meisenkothen; National Institute of Standards and Technology

10:30 AM  176 FIB Preparation of Bone-Implant Interfaces for Correlative On-Axis Rotation Electron Tomography and Atom Probe Tomography; J Huang, X Wang, K Grandfield; McMaster University, Canada

10:30 AM  177 3D Atom Probe Microscopy Sample Preparation by Using L-Shape FIB-SEM-Ar Triple Beam; X Man, T Asahata, T Fujii; Hitachi High-Technologies Corporation, Japan

10:30 AM  178 Efficient Diffractive Phase Optics for Electrons; J Pierce, T Harvey, BJ McMorrnan; University of Oregon; A Agrawal; National Institute of Science and Technology; P Ercius; Lawrence Berkeley National Laboratory

10:30 AM  179 Focused Ion Beam Direct-Write Nanofabrication of Surface Phonon Polariton Metamaterial Nanostructures; ND Bassim, JD Caldwell, A Giles; U.S. Naval Research Laboratory; LE Ocola; Argonne National Laboratory
## Scientific Program

### Thursday, August 7

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Poster #</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 AM</td>
<td><strong>180</strong> In-Situ Investigations of Individual Nanowires within a FIB/SEM System; M Löffler, S Banerjee, A Heinzig; Technical University Dresden, Germany; J Trommer, W Weber; Nanlab gGmbH, Germany; E Zschech; Fraunhofer Institute for Ceramic Technologies and Systems, Germany</td>
<td>394</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>181</strong> 3D Analytical TEM Approach to Effectively Characterize 3D-FinFET Device Features in Semiconductor Wafer-foundries; W Zhao, S Mongeon, B Fu, E Chen, D Flatoff, N LaManque, J Russell; Globalfoundries Inc.</td>
<td>395</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>182</strong> M&amp;M Student Awardee Gas-Mediated Electron Beam Induced Etching – From Fundamental Physics to Device Fabrication; AA Martin, I Aharonovich, M Toth; University of Technology, Sydney, Australia</td>
<td>396</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>183</strong> An Improved Specimen Preparation of Porous Powder Materials for Transmission Electron Microscopy; NY Kim, GH Ryu, HJ Park, Z Lee; Ulsan National Institute of Science and Technology, South Korea</td>
<td>397</td>
</tr>
</tbody>
</table>

### A08.P1 Nano-Characterization of Emerging Photovoltaic Materials and Devices

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Poster #</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 AM</td>
<td><strong>272</strong> Effects of Focused-Ion-Beam Processing on Local Electrical Measurements of Inorganic Solar Cells; HP Yoon, PM Haney, J Schumacher, K Sieben, Y Yoon, NB Zhitenev; National Institute of Standards and Technology</td>
<td>398</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>273</strong> Duplex Nanostructured TiO₂ Powder; AK Al-Kamal, J Al-Sharab, H Halim, G Xiong, BH Kear; Rutgers University</td>
<td>399</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>274</strong> Spatial Distribution of Light Scattering and Absorption Interactions with TiO₂ - Nanoparticles from Monte Carlo and Generalized-Multiparticle-Mie based Simulations for Dye-Sensitized Solar Cell Analysis and Optimization; I Carvajal, GP Demopoulos, R Gauvin; McGill University, Canada</td>
<td>400</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>275</strong> Investigation of the Use of Stereo-Pair Data Sets in Electron Tomography Characterization of Organic-Based Solar Cells; JA Alexander, FJ Scheltens, DW McComb; The Ohio State University; MF Durstock, CE Tabor, BJ Leever, LF Drummy, MD Clark, DP Butcher; U.S. Air Force Research Laboratory</td>
<td>401</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>276</strong> Using Electron Channeling Contrast Imaging for Misfit Dislocation Characterization in Heteroepitaxial II-V/Si Thin Films; J Deitz, S Carnevale, S Ringel, T Grassman, D McComb; The Ohio State University; M De Graef, Y Picard; Carnegie Mellon University</td>
<td>402</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>277</strong> Microscopic Investigation of Mono-Layer/Multi-Layer Self-Assembled InAs QDs on GaAs, Si/GaAs Composite Substrates for Photovoltaic Solar Cells; D Tang, Y Kim, N Faleev, C Honsberg, DJ Smith; Arizona State University</td>
<td>403</td>
</tr>
</tbody>
</table>

### A10.P1 X-ray Imaging

**Poster Session**

**Thursday 10:30 AM • Exhibit Hall AB**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Poster #</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 AM</td>
<td><strong>335</strong> IUMAS-6 Early Career Scholar X-ray Mapping Investigations of the Monazites from the Mt Weld Deposit - Compositional Variance as an Indicator of Provenance; TD Murphy, P Fisher, AJ Roper, JK Reynolds, R Wuhrer; University of Western Sydney, Australia</td>
<td>404</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>336</strong> In situ Compression Imaging of Polymer Foams using Synchrotron X-ray Computed Tomography; BM Patterson, Z Smith, KC Henderson, N Cordes; Los Alamos National Laboratory; N Chawla, J Williams; Arizona State University; X Xiao; Argonne National Laboratory; M Robinson; Atomic Weapons Establishment, United Kingdom</td>
<td>405</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>337</strong> The Use of a High-Resolution, High-Contrast X-ray Microscope to Probe the Internal Structure of Low Z Materials; JD Ferrara; Rigaku Americas Corporation; Y Araki, K Hamada, K Omote, Y Takeda; Rigaku Corporation, Japan</td>
<td>406</td>
</tr>
</tbody>
</table>
10:30 AM 338 X-ray Quantitative Microanalysis Maps across Interfaces of a Cu-Al Roll Bonded Laminate with an Annular Silicon Drift Detector; H Demers, N Brodusch, R Gauvin; McGill University, Canada; R Wuhrer; University of Western Sydney, Australia; K Moran; Moran Scientific Pty Ltd, Australia; P Woo; Hitachi High Technologies Canada Inc. Poster # 407

10:30 AM 339 X-ray Mapping and Chemical Phase Mapping with an Amptek SDD; L Moran, K Moran; Moran Scientific Pty Ltd, Australia; R Wuhrer; University of Western Sydney, Australia Poster # 408

A13.P1 Practical Applications and Analytical Trends of Metallography and Microstructure

Poster Session
Thursday 10:30 AM • Exhibit Hall AB

10:30 AM 435 A Characterization Study of Initial Gamma Prime Phase Formation Produced by Microwave; J Bernal, A Garcia; Universidad Politécnica de Pachuca, Mexico Poster # 409

10:31 AM 436 A Novel Method for Microstructural Characterization of Cast Iron; AM Varman, Jr.; Indian Institute of Technology, Madras Poster # 410

10:31 AM 437 A Method for Quantitative Analysis of Carbide Network Path Lengths in Ultrahigh Carbon Steel; MD Hecht, BA Webler, YN Picard; Carnegie Mellon University Poster # 411

10:31 AM 438 Precession Electron Diffraction Detection and Phase Mapping of Retained Austenite and Carbides in a Heat Treated Low Alloy Carbon Steel Using a JEOL ARM 200 TEM with an AppFive Topspin System for Synchronized Beam Scanning and Precession; A Darbal; AppFive LLC Poster # 412

10:31 AM 439 (Invited) Dynamic Analysis of Nanomachining with a Multi-Cracked AFM Cantilever; W-J Chang, H-L Lee, Y-C Yang; Kun Shan University, Taiwan Poster # 413

10:31 AM 440 A Transmission Electron Microscopy Study on Self-Catalyzed GaAs Nanostructures; YH KIM; Korea Research Institute of Standards and Science, South Korea Poster # 414

10:31 AM 441 Equiatomic NiCoAlFeMoTiCrx (x= 0,1) High Entropy Alloys Produced by Mechanical Alloying; FJ Baldenebro-Lopez, W Antunez-Flores, E Torres-Moye, I Estrada-Guel, JM Herrera-Ramirez, CD Gómez-Esparza, R Martínez-Sánchez; Centro de Investigación en Materiales Avanzados, Mexico Poster # 415

10:31 AM 442 Study of Au/Pd and Au/Co Bimetallic Nanoparticles Using Aberration Corrected STEM; N Bhattachari, S Khanal, D BAhena, A Ponce, M Jose-Yacaman; University of Texas at San Antonio Poster # 416

10:31 AM 443 Study of coarsening in γ’ precipitates by diffusion couples; CG Garay-Reyes, I Estrada-Guel, JL Hernández-Rivera, R Martínez-Sánchez; Centro de Investigación en Materiales Avanzados, Mexico; HJ Dorantes-Rosas; Instituto Politécnico Nacional, Mexico; JJ Cruz-Rivera; Universidad Autónoma de Ciudad Juarez, Mexico Poster # 417

10:31 AM 444 Influence of Cooling Rate on Corrosion Resistance of the A383 Aluminum to Biofuels E10, E30 and E100; A Santos, V Gallegos; Universidad Tecnológica Junta de los Rios, Mexico; R Martinez; Centro de estudio de materiales avanzados, Mexico; C Rodriguez; Universidad Autonoma de Ciudad Juarez, Mexico Poster # 418

10:31 AM 445 Phase Identification by EBSD Analysis of Non-Metallic Crystallites; H Yaghoobnejad Asl; Missouri University of Science and Technology Poster # 419

10:31 AM 446 Analysis of Titanium Microalloying in As-Received and Oxidized Crofer® 22 APU; LV Gambino, M Aindow; University of Connecticut; NJ Magdefrau; United Technologies Research Center Poster # 420

10:31 AM 447 Effect of a Coating Induced Residual Stress on Magnetic Domain Structure in Non-Oriented Electrical Steels; Y Ding, M Gallaugher, N Brodusch, R Gauvin, RR Chromik; McGill University, Canada Poster # 421
Scientific Program

A14.P1 Advances in Cathodoluminescence and Soft X-ray Microanalysis

Poster Session
Thursday 10:30 AM • Exhibit Hall AB

10:30 AM 459 The Present State of Chemical State Analysis in EPMA and WD-SXES; N Mori, T Murano, H Takahashi; JEOL Ltd., Japan

Poster # 422

10:30 AM 460 Cathodoluminescence and DART Mass Spectrometry for the Forensic Identification of Explosive and Narcotic Particle Residues on Surfaces; SA Wight, G Gillen; National Institute of Standards and Technology

Poster # 423

BIOLOGICAL SCIENCES SYMPOSIA THURSDAY MORNING

B04.P1 Advances in Sample Preparation for Cryo-EM Studies

Poster Session
Thursday 10:30 AM • Exhibit Hall AB

10:30 AM 616 Comparison of Classical SEM and ESEM Protocols for Study of Conifer Embryogenic Tissues with Using Low Temperature Conditions of ESEM; V Nedela, E Tihlarikova, J Hrib, J Runstuk; Institute of Scientific Instruments of the ASCR, Czech Republic

Poster # 424

10:30 AM 617 Cryo-SEM of Perpendicular Cross Freeze-Fractures Through a High-Pressure-Frozen Biofilm; V Krzyzanek, K Hrubanová; Institute of Scientific Instrument ASCR, Czech Republic; J Nebesarova; Biology Center ASCR, Czech Republic; F Ruzicka; Masaryk University, Czech Republic

Poster # 425

10:30 AM 618 Comparative TEM Studies of Liquid Crystals: Freeze Fracture, Plunge Freezing of Thin Films, and Cryosectioning of Bulk Samples; M Gao; Kent State University

Poster # 426

10:30 AM 619 Improving Sample Preparation Methods to Assess Nanoparticle Agglomeration using TEM; J Zheng; U.S. Food and Drug Administration

Poster # 427

10:30 AM 620 Cryo-Electron Microscopy of Latex-Pigment Composites for Enhanced Hiding in Latex Paints; JR Reffner, JB Bohling, M Keele; Dow Chemical Company

Poster # 428

PHYSICAL SCIENCES SYMPOSIA THURSDAY MORNING

P01.P1 Analytical Techniques and Their Application for the Study of Deformed Microstructures

Poster Session
Thursday 10:30 AM • Exhibit Hall AB

10:30 AM 736 EBSD-Analysis of Microstructural Changes Below Wire-EDMed Surfaces; A Schwedt, L Hensgen, J Dieckmann, A Klink, F Klocke, J Mayer; RWTH Aachen University, Germany

Poster # 429

10:30 AM 737 Experimental Investigation of Sub-Surface Deformation Using EBSD in Single Crystal Aluminum During Orthogonal Micromachining; S Nahata, YN Picard, BOzdoganlar; Carnegie Mellon University; N Kota; Science Applications International Corporation

Poster # 430

10:30 AM 738 Experimental Measurement of Young's Modulus from a Single Crystalline Cementite; B-W Koo, Y-J Chang, SP Hong, CS Kang, KH Oh, Y-W Kim; Seoul National University, South Korea; SW Jeong, W-J Nam; Kookmin University, South Korea; I-J Park, Y-K Lee; Tonsei University, South Korea

Poster # 431

10:30 AM 739 Transmission Electron Diffraction Investigation of White Etching Areas in Bearing Steels: A Comparison Between TKD and TEM; D Wu, V Bedekar, S Hyde; Timken Technology Center; A Avishai, AH Heuer; Case Western Reserve University

Poster # 432

10:30 AM 740 Effect of solubilization temperature, Zn addition and thermo-mechanical treatments in the microstructure of the aluminum 2024 alloy; CG Garay-Reyes, L González-Rodelas, I Estrada-Guel, R Martinez-Sánchez; Centro de Investigación en Materiales Avanzados, Mexico

Poster # 433

10:30 AM 741 Ultrashort Pulsed Laser Induced Heat Affected Zones Characterized by Ion Channeling Contrast Imaging; H Thompson, J Lammatao, MD Hecht, A Yousef, YN Picard; Carnegie Mellon University; BR Campbell; Robert Morris University

Poster # 434
Poster # 435

10:30 AM 743 Extraction of Metastable Icosahedral Quasicrystalline Nanoparticles from Zirconium and Hafnium Based Metallic Glasses; M Bauer, M Caputo, C Li; Clarion University of Pennsylvania; D Li; Youngstown State University; L Wang; Changchun Institute of Applied Chemistry, China  
Poster # 436

10:30 AM 744 JECP/QSAED, a Computer Program for Quantification of SAED Patterns; X-Z Li; University of Nebraska  
Poster # 437

10:30 AM 745 Effects of Preheat Supply on Embossed Pattern Depth in Roll-to-Roll Process; S Kim, Y Son, H Park, C Park, D Yun; Korea Institute of Machinery & Materials, South Korea  
Poster # 438

10:30 AM 746 Rayleigh Instability-Driven Fragmentation of Ion Tracks; A Khalil; Tabin Institute for Metallurgical Studies, Egypt  
Poster # 439

10:30 AM 747 Charge Density Determination for Al-Rich Composition L10-Ordered gamma-TiAl by Convergent Beam Electron Diffraction; X Sang; North Carolina State University; AK Kulovits; Carnegie Mellon University; G Wang; JMK Wiezorek; University of Pittsburgh  
Poster # 440

10:30 AM 748 NbC Precipitation and Deformation of SS 347H Crept at 850°C; B Shalchi Amirkhiz, S Xu; CanmetMAT-ERIALS, Canada  
Poster # 441

10:30 AM 749 Formation Process of 8° [001] Symmetric Tilt and 65.5° [-110] Symmetric Tilt Grain Boundaries During Annealing of a Cross Rolled Aluminium Sample; M Shamsuzzoha; University of Alabama  
Poster # 442

10:30 AM 750 Synthesis and characterization of Al reinforced with Al/ C nanoparticles Produced by Mechanical Milling; A Santos, V Gallegos; Universidad Tecnológica Junta de los Ríos, Mexico; M Santos, R Goytia, R Martinez; Centro de Investigación en Materiales Avanzados S.A. de C.V., Mexico  
Poster # 443

10:30 AM 751 Mechanical and Tribological Properties of Nanoparticles Aggregates determined using in situ AFM in the TEM; A Molza, J-L Mansot; Université des Antilles et de la Guyane , Guadeloupe; MJ-F Guinel; University of Puerto Rico; L Legras; EDF les Renardières, France  
Poster # 444

**P09.P1 Surface & Subsurface Microscopy & Microanalysis in Materials & Biological Systems**

**Poster Session**  
**Thursday 10:30 AM • Exhibit Hall AB**

10:30 AM 1052 Colossal Carbon Supersaturation of Delta Ferrite in 17-7 PH Stainless Steel; D Wang, C-W Chen, R Sharghi-Moshtaghin, H Kahn, GM Michal, F Ernst, AH Heuer; Case Western Reserve University  
Poster # 445

10:30 AM 1053 Sliding-induced Microstructure of Cold-Sprayed Copper Coating Observed by Electron Channeling Contrast Imaging; Y Zhang, N Brodusch, JM Shockley, R Gauvin, RR Chromik; McGill University, Canada  
Poster # 446

10:30 AM 1054 Nanohardness and Microstructure of NiCoAlFe-Cu and NiCoAlFeCuCr Alloys Produced by Mechanical Alloying; CD Gómez-Esparza, K Campos-Venegas, O Solis-Canto, JM Herrera-Ramírez, R Martinez-Sánchez; Centro de Investigación en Materiales Avanzados, Mexico; JM Alvarado-Orozco, J Muñoz-Saldaña; Centro de Investigación y de Estudios Avanzados del IPN, Mexico  
Poster # 447

10:30 AM 1055 Investigations on the Microstructure and Microanalysis of the Gas Shale Sample Prepared by SEM Ion Mill by Off-Centering the Ion Beams; R Cerchiaro, L Marsh, PE Fischione; E.A. Fischione Instruments, Inc.  
Poster # 448

10:30 AM 1056 Osseointegration of Titanium Ti-6Al-4V Alloy Implants in the Rat Femur: A Time-course SEM Study; G Sovak; Canadian Memorial Chiropractic College; A Weiss, I Gotman; Technion-Israel Institute of Technology  
Poster # 449
### Scientific Program

**10:30 AM**  **1057** Elemental Quantification and Visualization of GaN Structures using APT and SIMS; AS Giddings, TJ Prosa, HG Francois-Saint-Cyr, DJ Larson; CAMECA Instruments Inc.; A Merkulov; CAMECA SAS, France; FA Stevie; North Carolina State University; NG Young, JS Speck; University of California, Santa Barbara  
*Poster # 450*

**10:30 AM**  **1058** (Invited) IUMAS-6 Early Career Scholar Structural and Morphological Investigations of β-Cyclodextrin-Coated Silver Nanoparticles; PF Andrade, AF de Faria, DS da Silva, JA Bonacin, MDC Gonçalves; University of Campinas, Brazil  
*Poster # 451*

**10:30 AM**  **1059** IUMAS-6 Early Career Scholar Volatile p-Nitroaniline as Matrix for High Spatial Resolution Imaging of Phospholipids in Both ion Modes by AP-MALDI-IMS; SMatsushita, E Sugiyama, T Hayasaka, N Masaki; Hama-matsu University School of Medicine, Japan  
*Poster # 452*

**10:30 AM**  **1060** Nucleated Growth of Iron Pyrite on Highly Oriented Pyrolytic Graphite (HOPG) by Chemical Vapor Deposition (CVD); YJ Kwon, J Hemminger; University of California, Irvine  
*Poster # 453*

**10:30 AM**  **1061** Magnetic Arrays Produced by Electron Beam Nanolithography from Fe$_3$O$_4$ Compressed Nanoparticles Targets; GPerez; Instituto Nacional de Metrologia, Qualidade e Tecnologia, Brazil; GSolorzano; Pontifical Catholic University of Rio de Janeiro, Brazil  
*Poster # 454*
**Scientific Program**

**ADVANCES IN INSTRUMENTATION SYMPOSIA**  
**THURSDAY AFTERNOON**

**A02.08 Advances in Imaging and Spectroscopy in STEM**

Session Chairs:  
Nigel D. Browning, Pacific Northwest National Laboratory; Peter D. Nellist, University of Oxford, United Kingdom; Maria Varela del Arco, Oak Ridge National Laboratory

Platform Session  
Thursday 1:30 PM • Room: 14

1:30 PM  56 (Invited) Evaluation of Sensitivity of Multivariate Statistical Analysis on STEM Spectrum-Imaging Datasets and its Improvement; M Watanabe; Lehigh University; K Ishizuka; HREM Research Inc.

2:00 PM  57 Zone Axis STEM Defect Imaging Based on Electron Kossel Patterns; ML Bowers, MC Brandes, MJ Mills; The Ohio State University; PJ Phillips; University of Illinois, Chicago; J Kwon, M De Graef; Carnegie Mellon University

2:15 PM  58 Characterizing Sub-lattice Occupancies in B2 Phases in High Entropy Metallic Alloys using Atomic Resolution STEM-XEDS Mapping; REA Williams, BD Esser, GB Viswanathan, B Welk, DW McComb, HL Fraser; The Ohio State University; A Genc; FEI Company; M Gibson; CSIRO, Australia; LJ Allen; University of Melbourne, Australia

**A03.03 TEM Phase Contrast Imaging in Biological and Materials Science**

Session Chair: Michael Marko, Wadsworth Center

Platform Session  
Thursday 1:30 PM • Room: 23

1:30 PM  109 (Invited) Challenges in Phase Plate Product Development; B Buijsse, G van Duinen, K Sader; FEI Company, Netherlands; R Danev; Max Planck Institute of Biochemistry, Germany

2:00 PM  110 Artifact-Free, Long-Lasting Phase Plate; SH Irsen, J Overbuschmann; Center of Advanced European Studies and Research; P Kurth, S Pattai, J Wamser, D Rudolph; KonTEM GmbH, Germany

2:15 PM  111 (Invited) High Throughput Fabrication Process of a Zernike Phase Plate; Y Konyuba, H Iijima, M Suga, Y Ohkura; JEOL Ltd., Japan; Y Abe; Yamagata Research Institute of Technology, Japan

2:45 PM  112 First Demonstration of Phase Contrast Scanning Transmission Electron Microscopy; H Minoda, T Tamai; Tokyo University of Agriculture and Technology, Japan; H Iijima, F Hosokawa, Y Kondo; JEOL Ltd., Japan

**A05.03 15 Years of Focused Ion Beams at M&M**

Session Chairs:  
Lucille A. Giannuzzi, L.A. Giannuzzi and Associates;  
Keana Scott, National Institute of Standards and Technology;  
Nicholas Antoniou, Harvard University

Platform Session  
Thursday 1:30 PM • Room: 17

1:30 PM  157 (Invited) Application of a FIB/SEM to Study the Occlusion of Dentine Tubules from a Calcium Sodium Phosphosilicate Bioactive Glass (Novamin); RM Langford; Cambridge University, United Kingdom; JS Earl; Glaxo SmithKline, United Kingdom; A Merkle; Carl Zeiss X-ray Microscopy

2:00 PM  158 From Oil Field to Ptychography: Applications of FIB SEM in NanoGeoScience; KN Dalby, HO Sørensen, D Mueter, D Jha, SSL Stipp; University of Copenhagen, Denmark; JC Da Silva; Paul Scherrer Institut, Switzerland

2:15 PM  159 3D Nanoscale Analysis Using Focused Ion Beam Tomography of Carbonaceous Nanoglobules in Matrix Materials From the Taigish Lake Meteorite; ND Bassim, RM Stroud; U.S. Naval Research Laboratory; K Scott; National Institute of Standards and Technology; L Nitter; Carnegie Institution of Washington; C Herd; University of Alberta

2:30 PM  160 In situ FIB-SEM Experimentation: From Nanoscale Wetting to Nano-fabrication of Gallium-based Liquid Metals; K Doudrick, S Liu, K Rykaczewski; Arizona State University; E Mutunga, KL Klein; University of District of Columbia; KK Varanasi; Massachusetts Institute of Technology

2:45 PM  161 15 Years of Characterizing Titanium Alloys’ Microstructure by DBFIB; REA Williams, J Sosa, D Huber, HL Fraser; The Ohio State University
A08.03 Nano-Characterization of Emerging Photovoltaic Materials and Devices

Session Chairs:
Robert F. Klie, University of Illinois at Chicago;
Moon Kim, University of Texas at Dallas

Platform Session
Thursday 1:30 PM • Room: 15

1:30 PM 265 (Invited) Interfaces and Extended Structural Defects in Chalcopyrite Thin-Film Solar Cells Studied by Transmission Electron Microscopy; SS Schmidt, J Dietrich, S Merdes, D Abou-Ras; Helmholtz-Zentrum Berlin für Materialien und Energie, Germany; CT Koch; Universität Ulm, Germany; B Schaffer; Gatan; M Schaffer; Max-Planck-Institut für Biochemie, Germany; M Klingsporn; Leibniz-Institut für innovative Mikroelektronik, Germany

2:00 PM 266 (Invited) Photoluminescence Imaging of Semiconductors; K Alberi, B Fluegel, A Mascarenhas; National Renewable Energy Laboratory

2:30 PM 267 Probing Structure/Property Relationships of Ce-Rich Oxygen Evolution Catalysts by Advanced Transmission Electron Microscopy; C Kisielowski, JA Haber, JM Gregoire, Y Cai; Lawrence Berkeley National Laboratory

2:45 PM 268 Atomic Resolution Characterization of Pt Based Bi-Metallic Nano-Catalysts Using Aberration Corrected STEM; G Yang, S Cheng; Xi’an Jiaotong University, China; G Hu, T Wagberg; Umea University, Sweden

A09.05 Frontiers in Analytical TEM-STEM

Session Chairs:
Gianluigi Botton, McMaster University, Canada;
Juan-Carlos Idrobo, Oak Ridge National Laboratory;
Ai Leen Koh, Stanford University;
Paolo Longo, Gatan Inc.

Platform Session
Thursday 1:30 PM • Room: 22

1:30 PM 296 The Role of Cation Intermixing, Interfacial Chemistry, and Oxygen Deficiency in Understanding the Properties of the LaFeO/SrTiO,(100) Interface; R Colby, B Kabius; Environmental Molecular Sciences Laboratory; HKL Zhang, S Chambers; Pacific Northwest National Laboratory; A Genc, L Pullam; FEI Company

1:45 PM 297 Methods for Scanning Transmission Electron Microscopy High Angle Annular Dark Field Based for Three Dimensional Analysis of the Local Composition in Solid Alloys; E Rotunno; CNR-Istituto Materiali per Elettronica e Magnetismo, Italy; V Grillo; CNR-Istituto Nanoscienze, Italy; T Markurt, T Remmele, M Albrecht; Leibniz Institute for Crystal Growth, Germany

2:00 PM 298 Structure Analysis of a Hyper-Complex Approximant to Icosahedral Quasicrystal using 3D Electron Diffraction Tomography; P Oleynikov, Y Ma; Stockholm University; N Fujita, AP Tsai; Tohoku University, Japan; J Garcia-Garcia; Universidad Complutense de Madrid, Spain; KB Yoon; Sogang University, South Korea; O Terasaki; Korea Advanced Institute of Science and Technology, South Korea

2:15 PM 299 Very Large Solid Angle Windowless SDD Applications for Nanostructure and Semiconductor Applications; V Bhadare, N Rowlands; Oxford Instruments NanoAnalysis, United Kingdom; P Phillips, T Paulauskas, R Klie, A Nicholls; University of Illinois

2:30 PM 300 Investigation of Surface Plasmon Coupling and Damping in Au and Ag Nanoparticle Assemblies by Monochromated Electron Energy Loss Spectroscopy; AM Thron, A Polyakov, PJ Schuck, S Aloni; Lawrence Berkeley National Laboratory

2:45 PM 301 Electron-Energy Loss and Optical Spectroscopy of Hybrid Nanoparticle-Antennas on Different Substrates; T Brintlinger, JP Long, RM Stroud, I Vurgaftman, BS Simpkins; U.S. Naval Research Laboratory; AA Herzing; National Institute of Standards and Technology

A10.04 X-ray Imaging

Session Chairs:
Jeffrey M. Davis, National Institute of Standards and Technology;
Ric Wührer, University of Western Sydney;
Eric Telfeyan, U.S. Environmental Protection Agency

Platform Session
Thursday 1:30 PM • Room: 12

1:30 PM 331 (Invited) Need for Large-Area EDX Detectors for Imaging Nanoparticles in a SEM Operating in Transmission Mode; S Rades, V-D Hodoroaba; Bundesanstalt für Materialforschung und prüfung, Germany; T Salge; Bruker Nano; R Schmidt; Hitachi High-Technologies Europe, GmbH, Germany
Scientific Program

A11.05 Frontiers of Electron-Probe Microanalysis

Session Chairs:
John Armstrong, Carnegie Institution for Science;
Paul Carpenter, Washington University in St. Louis;
Hideyuki Takahashi, JEOL Ltd., Japan;
Mike Jercinovic, University of Massachusetts Amherst

Platform Session
Thursday 1:30 PM • Room: 24

A13.04 Practical Applications and Analytical Trends of Metallography and Microstructure

Session Chairs:
Frauke Hogue Hogue Metallography;
Frank Müicklich Saarland University, Germany

Platform Session
Thursday 1:30 PM • Marriott Ballroom B

A14.02 Advances in Cathodoluminescence and Soft X-ray Microanalysis

Session Chairs:
Colin M. MacRae CSIRO-Minerals, Australia;
Marion A. Stevens-Kalceff University of New South Wales, Australia;
Scott A. Wight National Institute of Standards and Technology

Platform Session
Thursday 1:30 PM • Room: 16
Scientific Program

**PHYSICAL SCIENCES SYMPOSIA**

**THURSDAY AFTERNOON**

**P01.03 Analytical Techniques and Their Application for the Study of Deformed Microstructures**

Session Chairs:
- Michael B. Matthews, Atomic Weapons Establishment, United Kingdom;
- Frederick Meisenkothen, National Institute of Standards and Technology;
- Stefan Zaefferer Max-Planck-Institut für Eisenforschung GmbH, Germany

Platform Session

Thursday 1:30 PM • Room: 11

1:30 PM 732 (Invited) Combined Use of DIC, EBSD and Simulation to Understand the Microscale Plastic Strain Distribution in Mg Alloys; CW Sinclair; University of British Columbia, Canada

2:00 PM 733 Comparison of Techniques for Strain Measurements in CuInSe₂ Absorber Layers of Thin-Film Solar Cells; N Schäfer; Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany

2:15 PM 734 Structure-Property Investigations via SEM In situ Micromechanical Testing; R Wheeler; MicroTesting Solutions LLC; D Bhattacharya; Australian Nuclear Science and Technology Organization; A Pandey, A Shyam; Oak Ridge National Laboratory; A Shiveley; Shiveley Technology Corporation; D Sergison; Sergison Machine

2:30 PM 735 (Invited) Interdependencies Between Mechanical Properties and Microstructural Development During One-Dimensional Shock Loading; J Millett; AWE Hydrodynamics Division, United Kingdom
**Scientific Program**

**P02.09 Advances in *In situ* Microscopy**

*Platform Session*
*Thursday 1:30 PM • Exhibit Hall AB*

1:30 PM 794 Visualizing the Optically Induced Near-fields of Nanoplasmonics with Ultrafast Transmission Electron Microscopy; A Yurtsever; Institut National de la Recherche Scientifique, Canada

2:00 PM 795 Practical Considerations for Ultrashort Electron Pulse Characterization in Ultrafast Transmission Electron Microscopy; D Plemmons, DJ Flannigan; University of Minnesota

2:15 PM 796 Surface Atomic Diffusion Processes Observed at Milliseconds Time Resolution using Environmental TEM; W Gao, J Wu, X Zhang, A Yoon, J Mabon, W Swiech, W Wilson, H Yang, JM Zuoz; University of Illinois, Urbana-Champaign

2:30 PM 797 In situ TEM Observation of Solid Electrolyte Interface Using High Speed Direct Electron Camera; L Jin, BE Bammes, D-H Chen, MS Spilman, RB Bilhorn; Direct Electron, LP

2:45 PM 798 High Resolution Observations of Interface Dynamics Using a Direct Electron Detection Camera; T Radetic; University of Belgrade; A Gautam, C Ophus, U Dahmen; Lawrence Berkeley National Laboratory; C Czarnik; Gatan, Inc.

**P07.06 Microscopy and Characterization of Ceramics, Polymers, and Composites**

*Session Chairs: S.K. Sundaram, Alfred University; James E. Martinez, NASA Johnson Space Center*

*Platform Session*
*Thursday 1:30 PM • Marriott Ballroom A*

1:30 PM 967 (Invited) Microstructure-Property Relations in Melt Processed and Spark Plasma Sintered Ceramic Waste Forms; BM Clark, P Turmurugoti, SK Sundaram; Alfred University; JW Amoroso, JC Marra; Savannah River National Laboratory; KS Brinkman; Clemson University

2:00 PM 968 Quantitative Morphology Characterization of New PC-Siloxane Copolymer Blends; L Yang, R van de Grampel, R Groote, O Guise; SABIC Innovative Plastics, Netherlands

2:15 PM 969 Nanodiffraction Characterization of Grain Boundary Structures in Nanocrystalline MgAl2O4, prepared by Electric Field Assisted Sintering; JF Rufiner, RHR Castro, K van Benthem; University of California, Davis; T LaGrange; Lawrence Livermore National Laboratory

2:30 PM 970 Visualizing Hydrated Polymeric Membranes Using X-Ray Microscopy; S Soundara Manickam, JR McCutcheon; University of Connecticut; J Gelb; Carl Zeiss X-ray Microscopy

**P09.08 Surface & Subsurface Microscopy & Microanalysis in Materials and Biological Systems**


*Platform Session*
*Thursday 1:30 PM • Marriott Ballroom D*

1:30 PM 1049 (Invited) Nano-Focused Vibrational Spectroscopy Reaching the Single Quantum Level: Imaging Structure, Function, and Dynamics on the Nanoscale; MB Raschke; University of Colorado, Boulder

2:00 PM 1050 (Invited) The Practical Aspects of ToF-SIMS Analysis in the Industrial and Contract Laboratory Setting; B Hagenhoff, E Tallarek, M Fartmann, R Kersting; Tascon GmbH, Germany

2:30 PM 1051 Applications of Low Voltage Field Emission Scanning Electron microscopy (FE-SEM) for characterization of Polytetrafluoroethylene (PTFE) and Polyvinylidene Fluoride (PVDF) Based Materials for Membrane Separations; P Bajaj, A Berzinis, R Giessert, C Strom; SABIC Innovative Plastics, Netherlands
### ADVANCES IN INSTRUMENTATION SYMPOSIA

**THURSDAY AFTERNOON**

**A03.04 TEM Phase Contrast Imaging in Biological and Materials Science**

Session Chair: Michael Marko, Wadsworth Center

**Platform Session**

Thursday 3:30 PM • Room: 23

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenters</th>
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<tbody>
<tr>
<td>3:30 PM</td>
<td>113  (Invited) Ultimate Recovery of Low-Frequencies in Thin-film ZPC-TEM by Inverse Projector; Y Nagatani, K Murata, N Miyazaki, M Ohara, K Nagatani; National Institute for Physiological Sciences, Japan; Y Kimori; National Institutes of Natural Sciences, Japan; T Itoh, Z Saitoh, M Ikeda; Terabase Inc.</td>
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<td>4:00 PM</td>
<td>114  Innovative Phase Plates for Beam Shaping; V Grillo, GC Gazzadi; CNR-Istituto Nanoscienze, Italy; E Karimi, RW Boyd; University of Ottawa, Canada; R Balboni; CNR- Istituto per La Microelettronica E Microsistemi Bologna, Italy; S Frabboni, E Mafakheri; Università di Modena e Reggio Emilia, Italy</td>
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<tr>
<td>4:15 PM</td>
<td>115  (Invited) Charging of Thin-Film Phase Plates under Electron Beam Irradiation; M Malac, M Bergen; National Institute for Nanotechnology, Canada; M Beleggia; Technical University of Denmark; RF Egerton; University of Alberta, Canada; M Kawasaki, K Motoki; JEOL USA; Y Okura, I Ishikawa; JEOL Ltd., Japan</td>
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<td>4:45 PM</td>
<td>Roundtable Discussion of TEM Phase Contrast Imaging; M Marko</td>
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**A05.04 15 Years of Focused Ion Beams at M&M**

Session Chairs:
- Lucille A. Giannuzzi, L.A. Giannuzzi and Associates;
- Keana Scott, National Institute of Standards and Technology;
- Nicholas Antoniou, Harvard University

**Platform Session**

Thursday 3:30 PM • Room: 17

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<th>Time</th>
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<tr>
<td>3:30 PM</td>
<td>162  FIB Lift Out of Columnar Carbon Structures; CA Wisner; Missouri University of Science and Technology</td>
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<td>3:45 PM</td>
<td>163  Advancing Materials Characterization in the FIB-SEM with Transmission Kikuchi Diffraction; F Bauer; Oxford Instruments GmbH, Germany; SD Sitzman; Oxford Instruments America Inc; C Lang, C Hartfield, J Goulden; Oxford Instruments NanoAnalysis, United Kingdom</td>
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<td>4:00 PM</td>
<td>164  Cryo-FIB Minimizes Ga+ Milling Artifacts in Sn; T Chou; Stevens Institute of Technology; ME Williams; National Institute of Standards and Technology</td>
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<td>4:15 PM</td>
<td>165  Integration of Cryo-FIB-SEM Imaging into Dynamic Thermo-fluidic Experimentation: Applications to Multifunctional Nanoengineered Surface Design; K Rykaczewski; Arizona State University</td>
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<td>4:30 PM</td>
<td>166  Ga+ Ions and Xe+ Plasma: Complementary FIBs for Resin-Embedded Life Science Sample Analyses; JL Riesterer, R Kelley; FEI Company</td>
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<td>4:45 PM</td>
<td>167  Xenon Focused Ion Beam in the Shape Memory Alloys Investigation – The Case of NiTi and CoNiAl; J Kopeček, K Jurek, V Kopecký, L Klimší, H Seiner, P Sedláček, M Landa, O Heczko; Academy of Sciences of the Czech Republic; J Dluhoš, M Petrenec, L Hladík, A Doupal; Tescan Brno s.r.o., Czech Republic</td>
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A08.04 Nano-Characterization of Emerging Photovoltaic Materials and Devices

Session Chairs:
Robert F. Klie, University of Illinois at Chicago; Moon Kim, University of Texas at Dallas

Platform Session
Thursday 3:30 PM • Room: 15

3:30 PM 269 (Invited) Electron Energy-Loss Spectroscopic Imaging for Phase Detection in Organic Photovoltaics; O Dyck; University of Tennessee, Knoxville

3:45 PM 270 Linking Processing Parameters and Morphological Development in Organic Photovoltaics by Energy-Filtered TEM Imaging of Model Multilayer Structures; AA Herzing, HW Ro, DM DeLongchamp; National Institute of Standards and Technology

4:00 PM 271 M&M Student Awardee Three-Dimensional Arrangement and Connectivity of Lead-Chalcogenide Nanoparticle Assemblies for Next Generation Photovoltaics; BH Savitzky, K Whitham, K Bian, R Hovden, T Hanrath, LF Kourkoutis; Cornell University

4:00 PM 365 Determination of the k-Values of Copper-Gold Alloys with ED- and WD-EPMA – Results of an Inter-laboratory Comparison; V-D Hodoroaba, V Rackwitz, W Bremser, WES Unger; BAM Federal Institute for Materials Research and Testing, Germany; RB Marinenko; National Institute of Standards and Technology

4:15 PM 366 EPMA WDS Quality Assurance: Materials and Methods; D Meier, J Davis, R Marinenko, F Meisenkothen, S Wight; National Institute of Standards and Technology

4:30 PM 367 Low Energy Microanalysis by EDS or WDS? Comparisons and Concerns from an Analytical Services Laboratory Perspective; CS Schwandt; Mc Crane Associates, Inc.

A11.06 Frontiers of Electron-Probe Microanalysis

Session Chairs:
John Armstrong, Carnegie Institution for Science; Paul Carpenter, Washington University in St. Louis; Hideyuki Takahashi, JEOL Ltd., Japan; Mike Jercinovic, University of Massachusetts Amherst

Platform Session
Thursday 3:30 PM • Room: 24

3:30 PM 363 What’s Still Missing with the Fluorescence Corrections and Should We Care?; JT Armstrong; Carnegie Institution of Washington; JJ Donovan; University of Oregon

3:45 PM 364 FEG-EPMA of Solid State Redox Sensors – the Effect of Secondary Fluorescence on Analytical Precision; J Wade; University of Oxford, United Kingdom; B Buse, S Kearns; University of Bristol, United Kingdom

3:30 PM 455 Cathodoluminescence Microanalysis of Amorphised Quartz; MA Stevens-Kalceff; University of New South Wales, Australia; CM MacRae, NC Wilson, A Torpy, Z Li, C Delle Piane, D Dewhurst; CSIRO, Australia; S Kidder; University of Otago, New Zealand

4:00 PM 456 Novel Cathodoluminescence Detector with Extremely Large Field of View; J Kološová, J Jiruše; TESCAN Brno s.r.o., Czech Republic

4:15 PM 457 Quartz Overgrowths in Shales and Sandstones studied by EPMA and SIMS; CM MacRae, NC Wilson, A Torpy, Z Li, C Delle Piane, D Dewhurst; CSIRO, Australia; S Kidder; University of Otago, New Zealand

4:30 PM 458 Luminescence Database: An Update; NC Wilson, CM MacRae, A Torpy; CSIRO, Australia; M Gaf; Laser Distance Spectrometry Ltd. Israel; J Götze; Technische Universität Bergakademie Freiberg, Germany; C Lenz; University of Vienna, Austria; JM Hanchar; Memorial University of Newfoundland, Canada; G Barmarin; Online Database of luminescent minerals, Austria; L Nasdala; Universität Wien, Austria
BIOLOGICAL SCIENCES SYMPOSIA
THURSDAY AFTERNOON

B04.03 Advances in Sample Preparation for Cryo-EM Studies

Session Chairs:
Isabelle Rouiller, McGill University, Canada;
Howard Young, University of Alberta, Canada

Platform Session
Thursday 3:30 PM • Room: 25

3:30 PM  611 Immunogold Labeling of Cultured Cells and Virus Particles for Electron Microscopy and Cryo-Electron Microscopy Applications; H Yi, JD Strauss, JE Hammonds, R Dyavar Shetty, RR Amara, PW Spearman, ER Wright; Emory University

3:45 PM  612 (Invited) Structural Cell Biology: Preparing Specimens for Cryo-Electron Tomography Using Focused-Ion-Beam Milling; E Villa; University of California, San Diego; M Schaffer, B Engel, W Baumeister; Max Planck Institute of Biochemistry, Germany; J Plitzko; Utrecht University, Netherlands

4:15 PM  613 Cryogenic FIB Lift-out as a Preparation Method for Damage-Free Soft Matter TEM Imaging; CD Parmenter, MW Fay; The University of Nottingham, United Kingdom; C Hartfield, G Amador, G Moldovan; Oxford Instruments NanoAnalysis, United Kingdom

4:30 PM  614 Simultaneous Imaging of Cryo-Bright Field, Dark Field STEM and SEM Using Unroofed Living Cells with Special Reference to Membrane Cytoskeletons; J Usukura; S Minakata; Nagoya University, Japan

4:45 PM  614 Reorganization of S. aureus ECM during Cryo-Preparation for SEM Imaging; Y Wu, J Liang, T-M Chou, M Libera; Stevens Institute of Technology; K Rensing; Leica Microsystems Inc.