10th Annual FIB SEM Workshop

Thursday, March 2, 2017

National Institute of Standards and Technology

Gaithersburg, MD

Organizers

Nabil Bassim
McMaster University

Kenneth Livi
Johns Hopkins University

Keana Scott
National Institute of Standards and Technology

Sustaining Sponsors

FEI

Platinum Sponsors

HITACHI Inspire the Next

BRUKER

ZEISS

OXFORD INSTRUMENTS The Business of Science®

kleindiek nanotechnik

RAITH NANOFABRICATION

SYNOPSYS®

Angstrom Scientific, Inc.

TM ExpressLO LLC

EDAX Smart Insight

TESCAN USA TESCAN ORSAY HOLDING

ORS object research systems

AMETEK MATERIALS ANALYSIS DIVISION

APPLIED BEAMS

Gold Sponsors

GATAN

ZERO K NANOTECH

Thursday, March 2nd, 2017

7:30 AM Breakfast & Sign-in

Morning Session (Green Auditorium)

8:45 AM **Mike Fasolka**
Acting Director, Material Measurement Laboratory, NIST
Welcome

9:00 AM **Brandon Van Leer**
FEI Company
Advanced S/TEM Sample Preparation Using Xe+ PFIB

9:15 AM **Adam V. Steele**[1], Andrew Schwarzkopf[1], Jabez J. McClelland[2], Brenton Knuffman[1]
[1] ZeroK NanoTech, [2] CNST/NIST
New Ion Source for Focused Ion Beam Applications

9:30 AM **Ed Principe**[1], David Weaver[2], Robert Chivas[3], Michael DiBattista[3], Scott Silverman[3]
[1] TESCAN USA, Incorporated, [2] SRI International, [3] Varioscale Incorporated
Plasma FIB Deprocessing of Integrated Circuits from the Backside

9:45 AM **Lucille Giannuzzi**
EXpressLO LLC
Optimizing Van der Waals Forces for Micromanipulation of FIB Lift Outs

10:00 AM Tobias Volkenandt[1], Fabián Pérez-Willard[1], **Michael Rauscher**[1], Pascal Maria Anger[2]
[1] Carl Zeiss Microscopy GmbH, [2] Carl Zeiss Microscopy, LLC
The Smart Way of Sample Preparation

10:15 AM ***COFFEE BREAK in LR B***

10:45 AM Nicolas Piche[1], Isabelle Bouchard[1], **Mike Marsh**[2]
[1] Object Research Systems, Montreal, Canada, [2] Object Research Systems, Denver, CO, USA
SegmentationTrainer - A Robust and User-Friendly Machine Learning Image Segmentation Solution

11:00 AM **Doug Wei**[1], Chuong Huynh[1], Stephen Kraemer[2]
[1] Carl Zeiss Microscopy, LLC, [2] Harvard University
3D Nanotomography using FIB/SEM and FIB/HIM – A Case Study with Porous Polymer Composite

11:15 AM Hongkyu Yoon[1], Thomas Dewers[1], Thomas Spirka[2], **Kerim Genc**[2]
[1] Sandia National Laboratories, [2] Synopsys Inc.
FIB-SEM imaging of carbonate rocks and digital rock physics

11:30 AM **Trevor Lancon**
Thermo Fisher Scientific
Pore Network Modeling to Explore Structure Interconnectivity

11:45 PM **Kedar Narayan**
Frederick National Labs, Frederick, MDNIH/NCI
3DEM of cells and tissue at Frederick National Lab

Lunch (West Square and Portrait Room)

12:00 PM Lunch

Poster Session (LR B)

1:00 PM **Lisa H Chan**[1], John Mangum[2], Brian Gorman[2]
[1] Tescan USA Inc., [2] Colorado School of Mines
Studying Titanium Dioxide with Correlative Raman-FIB-FESEM Microscopy

Bradley T. De Gregorio, Jonathan P. Winterstein, Rhonda M. Stroud
U.S. Naval Research Laboratory
Multi-Detector Scanning for Interstellar Dust Impact Craters in Aluminum Foil

Ali Hadjikhani, Sina Shahbazmohamadi
CHASE Lab, University of Connecticut
An attempt to quantify an inexpensive method for making a protective layer

Catherine Henry[1,3], Anupriya Aggarwal[2], Stuart Turville[2], Kedar Narayan[3]
[1] National Cancer Institute, [2] The Kirby Institute, University of New South Wales, [3] Frederick National Labs, Frederick, MDNIH/NCI
Quantifying the Location and Frequency of Viral Budding on HIV-Infected Dendritic Cells using CLEM/FIB-SEM

Daniel Goran[1], **Ted Juzwak**[2]
[1] Bruker Nano GmbH, [2] Bruker Nano Analytics
Advanced 3D EBSD data postprocessing for crystal plasticity analysis

Alex Krechmer, Alexander Sorkin, Chris Pawlowicz
TechInsights
Circuit Tracing on Integrated Circuit Using FIB Passive Voltage Contrast Effect

William McGehee, Thomas Michels, Vladimir Aksyuk, Jabez McClelland
Center for Nanoscale Science and Technology, NIST
Measurement of Ion Damage and Damage Relaxation in Silicon Microdisk Cavities using a Lithium Focused Ion Beam

V. Ray[1], G. Li[2], S. Samsonau[2], E. Chang[3]
[1] Particle Beam Systems & Technology, [2] Princeton International School of Mathematics and Science, [3] University of Maryland
Automating Reconstruction of Focused Ion Beam Current Density Distribution

R. Kirmse, A. Schertel, E. Hummel, P. Anger
Carl Zeiss Microscopy GmbH
Volume Imaging of Cellular Ultrastructure in Vitrified Biological Samples using Cryo FIB/SEM and Light Microscopy

Thomas Spirka[1], Miki Miyazaki[2], **Kerim Genc**[1], Ross Cotton[1], Philippe Young[1]
[1] Synopsys Inc., [2] JSOL Corporation
Image Based Meshing for the Creation of Finite Element Models of Microstructure from FIB SEM Data

M.J. Zachman[1], Z. Tu[2], L.A. Archer[2,3], and L.F. Kourkoutis[1,4]
[1] School of Applied and Engineering Physics, Cornell University, [2] Department of Materials Science and Engineering, Cornell University, [3] School of Chemical and Biomolecular Engineering, Cornell University, [4] Kavli Institute at Cornell for Nanoscale Science, Cornell University
Volume Imaging of Cellular Ultrastructure in Vitrified Biological Samples using Cryo FIB/SEM and Light Microscopy

Afternoon Session (Green Auditorium)

2:30 PM **Andrew J. Smith**[1], Andreas Rummel[1], Miroslava Schaffer[2], Stephan Kleindiek[1]
[1] Kleindiek Nanotechnik, [2] Max Planck Institute of Biochemistry
Using a cryo-compatible Micrograpper for cryo TEM Sample Liftout

2:45 PM **Jiri Dluhoš**[1], Marco Sebastiani[2], Tan Sui[3], Enrico Salvati[3], Christoph Schmid[4], Alexander M. Korsunsky[3]
[1] TESCAN Brno, s.r.o., [2] Roma Tré University, [3] University of Oxford, [4] TU Darmstadt
FIB-SEM Based Techniques for Residual Stress Evaluation at the Micro and Nanoscale

3:00 PM **Sz-Chian Liou**[1], Chuan-Fu Lin[2], Wen-An Chiou[1], Gary Rubloff[1,2]
[1] AIM Lab, Nano Center, University of Maryland, [2] Dept. of Materials Science and Eng., University of Maryland
Application of ToF-SIMS and STEM-EELS in the Study of Rechargeable Battery

3:15 PM **Ali Hadjikhani**, Sina Shahbazmohamadi
CHASE Lab, University of Connecticut
Fabrication of nanofilters using focused ion beam (FIB) and photolithography methods

3:30 PM ***COFFEE BREAK in LR B***

4:00 PM **Steven B. Herschbein**, Carmelo F. Scrudato, George K. Worth, Edward S. Hermann, Raymond L. Wagner
Globalfoundries
Exploring the Perceived Limits of Gallium-based Focused Ion Beam (FIB) Chip Circuit Editing

4:15 PM **Jamil J. Clarke**
Hitachi High Technologies America, Inc.
Auto Micro-Sampling: Development of the Next Generation [Automated] Software for FIB

4:30 PM **Tara Nylese**, Jens Rafaelsen
EDAX
High Speed EDS Data Output with Quality Performance Metrics

4:45 PM **V. Ray**[1], J. Taillon[2], L. S. Riba[2]
[1] Particle Beam Systems & Technology, [2] University of Maryland
Quantifiable Comparative Testing Approach for Evaluating FIB/SEM Instruments

5:00 PM **D. Elswick**, Y. Wang, C. Spence, S. Coyle, M. Hassel Shearer
Gatan, Inc.
Pico-Second Laser Tool for Producing TEM Lamella Larger Area & Enhanced FIB Productivity

5:15 PM Wrap-up

5:30 PM ***Happy Hour at the Growler's Brew Pub, Gaithersburg, MD***