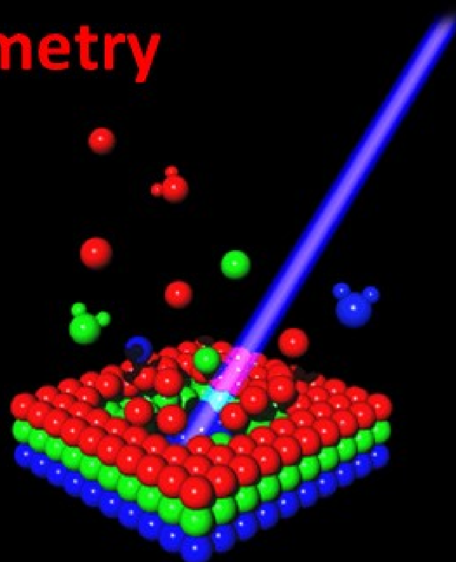
26th Annual Workshop on Secondary Ion Mass Spectrometry



May 27-30, 2014
Gaylord National Convention Center
National Harbor, MD

www.simsworkshop.org

26th Annual Workshop on Secondary Ion Mass Spectrometry and Related Techniques

Scientific/Program Committee:

Greg Gillen, NIST

Steven Hues, Micron Technology

Joe Bennett, Novati Technologies, Inc.

Christopher Szakal, NIST

Tim Brewer, NIST

Thomas Forbes, NIST

Shin Muramoto, NIST

Jerry Hunter, Virginia Tech

Fred Stevie, NCSU

Karen Bair, Director, Annual Workshop on SIMS

Carol Paterick, SIMS WWW/Database Coordinator

Nathan Havercroft, IonTOF

Michael Clark, Dow Chemical

Special Thanks to Our Corporate Sponsors:

IONTOF

Physical Electronics

Cameca Instruments

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Tuesday - May 27, 2014 (Travel Day)

1:00 - 6:00 PM Conference Registration /Vendor Exhibitor Setup/

6:00 - 9:00 PM Welcome Reception

Wednesday - May 28, 2014

7:30 - 8:00 AM **Continental Breakfast/Conference Registration**

8:00 - 8:10 AM Welcome and Introductions – Program Committee

Plenary

8:10 - 8:50 AM Atom Probe Tomography: Technology and Semiconductor Applications, David Larson, Cameca Instruments

8:50 - 9:30 AM Massive Cluster Bombardment of Organics, Arnaud Delcorte, Université Catholique de Louvain

9:30 - 10:10 AM TOF-SIMS of Ancient Insects, Yulia Goreva, Smithsonian Institute

10:10 - 10:30 AM **Break**

10:30 - 11:10 AM Strategies for Improving Precision of Low Abundance Isotope Ratio Analyses: Lessons Learned for ^{36}S Analyses using the IMS 1280, John Cliff, University of Western Australia

Instrumentation/Imaging

11:10-11:30 AM Applications of a “FIB-TOF-SIMS” with Mass Resolving Power >3000, Lex Pillatsch, Swiss Federal Laboratories for Materials Science and Technology

11:30-11:50 AM SIMS-based Correlative Microscopy for High-Resolution, High-Sensitivity Nano-Analytics, Tom Wirtz, Centre de Recherche Public - Gabriel Lippmann

11:50-12:10 PM Optimized Analysis of Imaging TOF-SIMS Data, Amy Walker, University of Texas at Dallas

12:10-1:10 PM **Lunch**

Geological/Isotopic/Elemental

1:10 - 1:30 PM Determination of C/N ratios with NanoSIMS, Angela Vogts, Leibniz-Institute for Baltic Sea Research

1:30 - 1:50 PM Improvements of Isotopic Ratio Reproducibility using EMs and O^- Primary Beam Performance on the Cameca NanoSIMS 50L, Francois Hillion, Cameca Instruments

1:50 - 2:10 PM Evaluating New Approaches for Single Particle Actinide Analysis, Chris Szakal, NIST

2:10 - 2:30 PM Initial Results from Secondary Ion Mass Spectrometer-Single Stage Accelerator Mass Spectrometer at the Naval Research Laboratory, Kamron Fazel, Naval Research Laboratory

2:30 - 2:50 PM On the Use of Energy Offsetting in TOF-SIMS Analysis, Scott Bryan, Physical Electronics

2:50 - 3:20 PM **Break**

Inorganic/Semiconductor Applications

3:20 - 3:40 PM A Comparison of the Analytical Figures of Merit for Time of Flight Secondary Ion Mass Spectrometry and Laser Ablation Inductively Coupled Plasma Mass Spectrometry, Stacia Wegst-Uhrich, University at Buffalo

3:40 - 4:00 PM Towards an Understanding of Cs Retention and Build Up Relationships Between Group III-V and IV Materials, A. Giordani, Virginia Polytechnic Institute and State University

4:00 - 4:20 PM Thermally Dependent Relocation of Cesium and its Effect on SIMS Analysis, Jerry Hunter, Virginia Polytechnic Institute and State University

4:20- 4:40 PM Interface Characterization of Inorganic/Organic Multilayers for OLED Applications using ToF-SIMS, T. Terlier, CEA, Leti

4:40 - 5:00 PM Depth Profiling of Inorganic Thin Films using Large Oxygen Gas Clusters: A Feasibility Study, Derk Rading, IonTOF

5:00 - 5:20 PM A Redesigned Cesium Source for Cameca SIMS Instruments, Peter Williams, Arizona State University

5:20 - 6:30 PM **Free Time**

Vendor Dinner

6:30 – 8:30 PM **Dinner provided with short presentations on latest developments from participating vendors**

Thursday - May 29, 2014

Technical Program

7:30 - 8:00 AM **Continental Breakfast**

Biological/Organic SIMS and Ambient MS

8:00 - 8:20 AM Towards Bioimaging by Massive Cluster Impact (MCI) on a TRIFT Instrument, Jitao Zhang, Arizona State University

8:20 - 8:40 AM Ed Sisco – Ambient Fingerprint Talk

8:40 - 9:00 AM Towards High Spectral and Spatial Resolution Mass Spectrometry Imaging of Biological Tissue Sections by IR-MALSESI, E. Rosen, North Carolina State University

9:00 - 9:20 AM Ambient Ionization Mass Spectrometry Imaging of Forensically Relevant Analytes using Desorption Electro-Flow Focusing Ionization, Thomas Forbes, NIST

9:20 - 9:40 AM TOF-SIMS Imaging and Depth Profiling for the Study of Interfacial Reactions in Ionic Liquids, Kan Shen, Pennsylvania State University

9:40 - 10:10 AM **Break**

10:10 - 10:30 AM Capturing Biomolecules and Biorganisms in 5 km/s Impacts with a Spacecraft: the Search for Life on ENCELADUS, Peter Williams, Arizona State University

10:30 - 10:50 AM Enhanced Molecular Imaging by Laser Ablation Electrospray Ionization Mass Spectrometry with Ion Mobility Separation, Bindesh Shrestha, The George Washington University

10:50 - 11:10 AM Probing the Mechanisms of Sphingolipid Domain Formation in the Plasma Membrane with SIMS, Mary L. Kraft, University of Illinois

11:10 - 11:30 AM Validation of Trace Biological Agent Sample Matching using Imaging Mass Spectrometry, Peter Weber, Lawrence Livermore National Laboratory

11:30 - 11:50 AM Increasing Secondary Ion Yields in TOF-SIMS using Water Cluster Primary Beams, John Vickerman, The University of Manchester

11:50 - 12:10 PM 3D ToF-SIMS Imaging of Biological Materials, David Castner, University of Washington

12:10 - 1:30 PM **Lunch**

Cluster SIMS Depth Profiling

1:30 - 1:50 PM Dual Beam Depth Profiling of Organic Materials: Assessment of Capabilities and Limitations, Ewald Niehuis, IonTOF

1:50- 2:10 PM Low Temperature Plasma for Bevel Crater Profiling of Crosslinking Organic Multilayers: Comparison with C_{60} and Argon Gas Cluster Sources, Shin Muramoto, NIST

2:10-2:30 PM GCIB-SIMS Depth Profiling Analysis – Mike Clark, Dow Chemical

Workshop Sponsor Session – Newest Developments in Instrumentation

2:30 - 2:50 PM PHI

2:50 - 3:10 PM Cameca IMS-7f-Auto: High Throughput & Automation, Paula Peres, Cameca Instruments

3:10 - 3:30 PM Ion TOF

Poster Session/ Reception

3:30- 5:30 PM

1. Analysis of Derivatized Organic Compound on the Silica Surface by TOF-SIMS, Jong S. Jin, Korea Basic Science Center

2. Direct Adhesion of PPS Resin and Triazine Thiol Polymeric Nanofilm Plates on Aluminum by Electrochemical Anodic Oxidation, E. H. Chung, Korea Basic Science Center

3. Cleaning Adventitious Hydrocarbon Contamination on SIMS Samples using IBSS Group, GV10X DS Asher, Vince Carlino, IBSS Group

4. Greg Gillen – Fundamentals of DART MASS Spec

5. Measurement of U-236 Particles by SIMS, David Simons, NIST

6. Method for Characterizing the Performance of Ambient Pressure Ionization Sources, Tim Brewer, NIST

7. SIMS Investigation of Surface-Modified Nanomaterials, Chao-Kai Liang, Texas A&M University

8. TOF-SIMS Chemical State Analysis with C_{60}^+ Cluster Ions, Steve Hues, Micron Technology

9. Expanding the Applications of Image Fusion, Jay Tarolli, Pennsylvania State University

10. Ambient Analysis of Cells and Tissues by Laser Ablation Electrospray Ionization Mass Spectrometry in Transmission Geometry, Rachelle Jacobson, George Washington University

11. Characterization of Metabolites and Lipids from Single Pollen Tubes and Grains by LAESI Mass Spectrometry with Ion Mobility Separation, Linwen Zhang, George Washington University

12. Enhanced Molecular Coverage in Negative Ion Mode and Reactive Laser Ablation Electrospray Ionization Mass Spectrometry, Amy Li, George Washington University

13. Quantitative Study of Oxygen Effect on Sputtered Ion Yields at Buried Interface, Zhichun Zhang, IBM Hudson Valley Research Park

14. C_{60}-SIMS Imaging of Exogenous Compounds within Mammalian Cells, Anna Bloom, Pennsylvania State University

15. Metabolite and Lipid Turnover Rates Determined by Pulse-Chase Analysis and Laser Ablation Electrospray Ionization Mass Spectrometry, Sylwia Stopka, George Washington University

16. Probing interface of charged nano-droplets using ion mobility mass spectrometry, Carina Minardi and Kaveh Jorabchi, Georgetown University

17. Plasma-assisted reaction chemical ionization for high-sensitivity elemental quantification of halogens in organic compounds, Ninghang Lin, Haopeng Wang, Kaveh Kahen, Hamid Badiei, and Kaveh Jorabchi, Georgetown University

18. Ed Sisco DART MS

19. Collision-induced Fragmentation and Photodissociation of Polycyclic Aromatic Hydrocarbons During Strong Field fs Laser Post-ionization, Nicholas Popczun, Pennsylvania State University

20. Utilizing Electron Bombardment to Modify Crater Topography, Jay Tuggle, Virginia Tech Nanoscale Characterization and Fabrication Laboratory

Receptions

5:30 - 7:30 PM **Vendor Receptions**

7:30 – 930 PM **Conference full reception**

Friday - May 30, 2014

Technical Program

7:30 - 8:10 AM **Continental Breakfast**

Cluster SIMS Fundamentals

8:10 - 8:30 AM SIMS Imaging with a Doped Ar Cluster Beam, Hua Tian, Pennsylvania State University

8:30 - 8:50 AM Using Laser Postionization to Investigate Secondary Ion Formation, Andreas Wucher, Universität Duisburg-Essen

8:50-9:10 AM Total Sputter Yields for Argon Gas Clusters Measured by a Quartz Crystal Microbalance, Peter Cumpson, Newcastle University

9:10-9:30 AM Understanding Carbon Buildup and SiC Mixing by Molecular Dynamics Simulations of Multi-impact C60 Bombardment of Si, Kristen Kranztman, College of Charleston

9:30 – 9:50 AM Trying to answer the question: What is the optimal cluster size and cluster energy for SIMS experiments? Robert J. Paruch, Pennsylvania State University

9:50 - 10:10 AM **Break**

10:10 - 10:30 AM Investigating Matrix Effects of Molecules with Varying Gas- Phase Basicities in Secondary Ion Mass Spectrometry with Laser Post Ionization, Jordan Lerach, Pennsylvania State University

10:30 - 10:50 AM Applications and Further Development of the High Resolution and Mass Accuracy Cluster SIMS, Christopher Anderton, Pacific Northwest National Laboratory

Nanoscale Characterization

10:50-11:10 AM A Method to Count Nanoparticles or Aggregates of Molecules on Surfaces, Emile Schweikert, Texas A&M University

11:10 - 11:30 AM Detector Dead-Time Effects in Atom Probe Tomography Multi-Hit Detection Events, Frederick Meisenkothen, NIST

11:30 - 11:50 AM Quantitative Analysis at Nanoscale with Single Impacts of Cluster Ions, Stanislav Verkhoturov, Texas A&M University

11:50 AM **Closing Remarks**