

# **21<sup>st</sup> Annual Workshop on Secondary Ion Mass Spectrometry**

## **Organizing Committee:**

Steven Hues, Micron Technology - Chairman  
Greg Gillen, NIST - Chairman  
Richard Lareau, DHS, Chairman

## Monday - May 12, 2008

**12:00- 6:00 PM** Registration & Vendor Exhibitor Setup

**6:00-10:00 PM** Opening Reception

## Tuesday - May 13, 2008

### **Tutorial Program (2008)**

**8:30-9:30 AM** Cluster SIMS of Polymers and Related Materials, Christine Mahoney, NIST

**9:30-10:30 AM** Focused Ion Beam Technology, Fred Stevie, NCSU

**10:30-11:00 AM** **Break**

**11:00-12:00 PM** Spectral Interpretation for TOF SIMS Mass Spectra, Alan Spool, Hitachi Global Storage

**12:00-1:00 PM** **Lunch**

**1:00-2:00 PM** Current Status of Atom Probe Mass Spectrometry, Paul Ronsheim, IBM

**2:00-3:00 PM** Internal Energy Deposition, Measurement and Effects in Mass Spectrometry. Graham Cooks, Purdue University

**3:00-3:30 PM** **Break**

**3:30-4:30 PM** Depth Profiling 101, Artifacts and Profile Interpretation, Joe Bennett, ATDF

**6:00-10:00 PM** **Poster Session/Mixer**

Wednesday – May 14, 2008

## Technical Program

- 7:30-8:15 AM      **Continental Breakfast**
- 7:30-4:00 PM      **Registration & Exhibitor Set up**
- 8:15-8:30 AM      **Welcome and Introductions**

### **Plenary Session 1** **Novel Developments in Mass Spectrometry**

- 8:30-9:00 AM      Ambient Ionization and Handheld Mass Spectrometers, R.G. Cooks, Purdue
- 9:00-9:30 AM      Ion-Nanoparticle Interactions and Characterization of Nanomaterials by TOF-SIMS, Dan Gaspar, PNNL
- 9:30-10:00 AM     SIMS Imaging of Cancer Cells; Kuang Jen Wu, Lawrence Livermore
- 10:00-10:30 AM    **Break**

### **Plenary Session 2** **New Instrumental Developments for SIMS**

- 10:30-10:50 AM    New TOF- SIMS Instrumentation for C<sub>60</sub>- SIMS – Overview, John Vickerman, UMIST
- 10:50-11:20 AM    SIMS Bioimaging with C<sub>60</sub> and a Hybrid Quadrupole-Orthogonal TOF Mass Spectrometer, Nick Winograd, Penn State University
- 11:20-11:50 PM    Imaging, Depth Profiling and MSMS Analysis on the Ionoptika J105, John Fletcher, UMIST
- 12:00-1:20 PM      **Lunch**

### **Related Techniques**

- 1:20-1:40 PM** Development of a FIB and SIMS Instrument, Fred Stevie, NC State University
- 1:40-2:00 PM** XPS, TEM, and SIMS Analysis of FIB Bombarded Surfaces at Various Ga<sup>+</sup> Ion Energies, Lucille Giannuzzi, FEI
- 2:00-2:20 PM** Atom Probe and SIMS as Complementary Techniques for the Observation and Quantitative Measurement of Microstructures, F. Horreard, Cameca
- 2:20-2:40 PM** Die Packaging Preparation using FIB/SIMS, Jeff Chen, Freescale Semiconductor

### **Special Historical Presentation:**

- 2:40-3:20 PM** Thoughts on a 50 Year Journey in SIMS, Georges Slodzian, University Paris, Sud
- 3:20-3:40 PM** **Break**

### **SIMS Business Meeting/ASTM Committee Meeting**

- 3:40-4:00 PM** SIMS Business Meeting (Richard Lareau)  
ASTM Meeting/Workshop - (Chair: Christine Mahoney)
- 4:00-6:00 PM** **Vendor User Meetings- Cameca, Phi, Ion TOF**

### **Vendor Dinner**

- 7:00-10:00 PM** Vendor Dinner

Thursday – May 15, 2008

## Technical Program

**7:30-8:15 AM Continental Breakfast**

**7:30-4:00 PM Registration**

### **Cluster SIMS**

**8:00-8:20 AM** Mass Imaging with Swift Heavy Ions (MeV-SIMS), J. Matsuo, Kyoto University

**8:20-8:40 AM** Glycerol Microdrop Cluster SIMS, Tim Brewer, NIST

**8:40-9:00 AM** Characterization of Individual Silver Nanoparticles and their Chemical Environment via Secondary Emission from Discrete Impacts of Au<sub>n</sub> and C<sub>60</sub>, S. Rakagopalachary, Texas A&M University

**9:00-9:20 AM** Energy Deposition during Molecular Depth Profiling with Cluster Ion Beams, Joe Kozole, Penn State University

**9:20-9:40 AM** High-Rate and Low-Damage Etching of Organic Materials with Large Gas Cluster Ions, S. Ninomiya, Kyoto University

**9:40-10:00 Break**

### **Semiconductors**

**10:00-10:30 AM** SIMS with Sub-keV O<sub>2</sub><sup>+</sup> Beams at Glancing Incidence, Jack Jiang, Freescale Semiconductor

**10:30-10:50 AM** Application of TOF-SIMS and LEIS for the Characterization of Ultra-Thin Films, Ewald Niehuis, IonTOF

**10:50-11:10 AM** Information Limits in SIMS Depth Profiling of Thin Films for Semiconductor Technology, A. Budrevich, Intel Corporation

**11:10-11:30 AM** An Accurate Depth Profiles within First Nanometers in Si based Semiconductor Structures using Ultra-Low Ion Impact Energy SIMS, A. Merkulov, Cameca Instruments

**11:30-11:50 AM** Qualitative and Quantitative Analysis of Silicon Oxynitride Layers – Comparison of Different SIMS Based Protocols, Christoph Schnuerer-Patschan, Cameca Instruments

**11:50-12:50 PM** **Lunch**

**Analysis of Organic Materials**

**12:50-1:20 PM** Recent Developments in Organic Depth Profiling with Low Energy Cesium Ions, Laurent Houssiau, Belgium

**1:20-1:40 PM** Desorption Electrospray Ionization Mass Spectrometry of Explosives, Chris Szakal, NIST

**1:40-2:00 PM** 3D Characterization of Drug Elution from a Coronary Stent by TOF-SIMS, Greg Fisher, Physical Electronics

**2:00-2:20 PM** Mass Spectrometry Imaging of Lignocellulosic Materials, Zhen Li, University of Illinois at Urbana-Champaign

**2:20-2:40 PM** Electron Beam and UV Photo-Patterning of Alkanethiolate Self-Assembled Monolayers (SAMs) Adsorbed on GaAs (001), Chuanzhen Zhou, Washington University in St. Louis

**2:40-3:00 PM** **Break**

**Workshop Sponsor Session (Chair: Fred Stevie)**

**3:00-3:20 PM** Physical Electronics

**3:20-3:40 PM** Cameca Instruments

**3:40-4:00 PM** ION TOF

**4:00 PM** **Workshop Outing – Walking Tour of the Alamo, Boat Trip on the Riverwalk, Dinner on your own.**

Friday – May 16, 2008

## Technical Program

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

**Continental Breakfast**

### **Fundamentals**

**8:00-8:20 AM**

Decreased Photofragmentation using Strong-Field Femtosecond Laser Postionization, D. Willingham, Penn State University

**8:20-8:40 AM**

Zero-Energy Depth Profiling?, Peter Williams, Arizona State University

**8:40-9:00 AM**

C<sub>60</sub> Bombardment of Solids: Atomistic, Mesoscale, Analytic Modeling and Depth Profiling Approaches, Barbara J. Garrison, Penn State University

### **Open Session**

**9:00-9:20 AM**

Secondary Ion Emission from Single Projectile Impacts on Nano-Objects, V. Pinnick, Texas A&M

**9:20-9:40 AM**

Probing Surface Topography and Composition with Event-by-Event TOF-SIMS, Li-Jung Chen, Texas A&M

**9:40-10:00 AM**

Advances in Organic Depth Profiling, Rudolf Moellers, IonTOF

**10:00-10:40 AM**

**Break**

**10:40-11:00 AM**

Optical Profiling vs. Stylus Profilometry: Advantages and Disadvantages for measuring SIMS Craters in PV Materials, M. R. Young, NREL

**11:00-11:20 AM**

A Comparative Study of Cluster SIMS and MALDI MSI with Sublimated Matrix in the Investigation of Lipids in Biological Tissues, M. Passarelli, Penn State University

**11:20-11:40 AM**

Inductively Coupled Plasma Source for Improved SIMS Performance, P. Tesch, Oregon Physics

**11:40-12:00 N**

**Closing Remarks**

**Posters:**

Depth Resolution Standards for Cluster SIMS Depth Profiling, Chris Szakal, NIST

Contaminant Analysis of Lithium Niobate Waveguide Devices using Three Dimensional Time-of-Flight Secondary Ion Mass Spectrometry, John A. Chaney, The Aerospace Corporation

Improved Performance of Cs Ion Sputtering for Quadrupole SIMS, Christoph Schnuerer-Patschan, Cameca

Detailed Examination of Microstrips with C<sub>60</sub> –SIMS in the Coincidental Mode, Li-Jung Chen, Texas A&M University

Effect of Low Energy Cs Implantation on Si Emission under Cluster Projectile Impacts, Zhen Li, Texas A&M University

(LiF)<sub>n</sub>F<sup>-</sup> Cluster Ion Emission from KeV Au Cluster Ion Bombardment, F.A. Fernandez-Lima, Texas A&M University

Making Metallic and Semiconductor Thin Films on Alkanethiolate Self-Assembled Monolayers: Characterization Using Time-of-Flight Secondary Ion Mass Spectrometry and Electron Microscope, Peng Lu, Washington University in St. Louis

Semiconductor Characterization using an IMS 1270 SIMS Instrument, Dave Simons, NIST

Mesa Sample Preparation for SIMS Profiling using an Automated Dicing Saw, T. Guenther, Freescale Semiconductor

Strategic Management of the SIMS Lab Resources Providing Support for Process Monitoring and Process Development of a Semiconductor Company, Thanas Budri, National Semiconductor Corporation

3D Visualization for SIMS Analysis, S. E. Reichenbach, University of Nebraska

C<sub>60</sub> Bombardment of Silicon - Comparison of SIMS and TEM, Greg Gillen, NIST