17th Annual Workshop on Secondary Ion Mass Spectrometry

Organizing Committee:

Greg Gillen, NIST - Chairman
Steven Hues, Motorola - Chairman
Richard Lareau, Transportation Security Admin - Chairman

Technical Program

Monday, Evening, May 17, 2004

7:00-10:15 PM Opening reception, registration and exhibit setup

Tuesday, May 18, 2004

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

8:00 - 8:15 AM **Welcome and Introductions**

Plenary Session (Chair: Workshop Organizers)

8:15 - 8:45 AM "Ion Beam Damage During Sputtering", Linda Dake, Utica College

8:45 - 9:15 AM "Organic Analysis by TOF SIMS", Scott Bryan, PHI

9:15 -10:15 AM "SIMS Quantification for Depth Profiling Overview, Recent Results for Surfaces and Insulators, and Current Problems", Fred Stevie, North Carolina State University

10:15 -10:35 AM **Morning Break**

Cluster SIMS: Chairs Nick Winograd and John Vickerman

10:35 - 11:05 AM "Polyatomic Ion Beams for ToF-SIMS - Prospects and Challenges"- John Vickerman, UMIST

11:05 - 1:25 AM "Massive Gold Clusters as Projectiles for SIMS "Emile Schweikert, Texas A&M

11:25 - 11:45 AM "Molecular Depth Profiling of Polymer Multilayers by Time of Flight Secondary Ion Mass Spectrometry", Matt Wagner,NIST

11:45 - 12:05 PM "XPS Depth profiling with C_{60}", Scott Bryan, PHI

12:05 - 12:25 PM "TOF-SIMS Imaging with a C_{60} Probe" , Nick Winograd, Penn State

12:25-12:45 PM "Fundamentals and Applications of a New Bi-Cluster Liquid Metal Ion Source" F. Kollmer, ION- TOF GmbH

12:45 - 1:45 PM **Lunch**

SIMS for Insulator Analysis/Isotopic and Geological Analysis (Chair: Albert Fahey)

1:45- 2:05 PM "Isotopic Measurements of Uranium", Albert Fahey, NIST

2:05- 2:25 PM "Interactions of Gaseous Nitric Acid with Surfaces of Environmental Interest", D.J. Gaspar, Pacific Northwest National Laboratory

2:25 - 2:55 PM "Determining Relative Sensitivities for Metals in Volcanic Glass using TOF-SIMS", Ed Vincenze, Smithsonian Institution

2:55-3:15PM "Magnetic Sector Analysis of Bulk Insulators Using O_2^+ Primary Beam With Electron Beam Adjacent to Analysis Area", Fred Stevie, North Carolina State University

3:15 - 3:30 PM **Afternoon Break**

Vendor Technical Session (Chair: Fred Stevie, NC State University)

3:30-3:50 AM Introduction to the new Cameca IMS 7F and IMS 1280, Michel Schuhmacher

3:50-4:10 AM Physical Electronics

4:10-4:30 AM ION-TOF

4:30-5:10 PM **SIMS Workshop Business Meeting and**
ASTM Meeting-ASTM Chair Christine Mahoney
Discussion of Standards Needs for Biomaterials/Pharmaceuticals/ Semiconductors
Dave Simons – Semiconductor Industry
Scott Bryan – Biomaterials and Pharmaceuticals
Kathy Lloyd – Organics and Polymers
Albert Fahey – Instrument Standards

Instrument Users Meetings

5:10 – 6:30 PM Tentative: Cameca, Ion TOF, PHI

6:30 - 7:00 PM Social Mixer

7:00 - 10:00 PM Vendor Sponsored Banquet and After Dinner Presentations
Chairs: Fraser Reich, Kore Technology and Fred Stevie, NC State University

After dinner sales presentations

Wednesday, May 18, 2004

7:30 - 8:00 AM Continental Breakfast

Semiconductor Characterization- (Joe Bennett and Jerry Hunter)

8:00-8:30 AM "Depth Profiling As in SiGe", Paul Ronsheim, IBM

8:30-8:50 AM "Variations in B and As RSFs in HfSiO Films"
Meredith Beebe, International SEMATECH

8:50-9:10 AM "Data Processing Complexity of Depth Profiles in Compositionally Varying Layers" Temel H. Buyuklimanli, Evans East

9:10-9:30 AM "Characterization of SiON Gate Dielectrics by SIMS: Comparison of TOF and Dynamic SIMS Measurements" Gary Mount, Charles Evans & Associates

9:30- 9:50 "Boron Depth Profiles Using a Magnetic Sector with Impact Energies Down to 200 eV", STMicroelectronics,

9:50 - 10:20 **AM Morning Break**

Biomaterials Characterization (Chair: Christine Mahoney and Matt Wagner)

10:20- 10:40 PM "TOF-SIMS Analysis of Model Biomaterial Surfaces: What We Can Learn from SIMS on SAMs", Dan Graham, University of Washington

10:40 - 11:00 PM "Characterization of Bacillus Endospores studied by TOF-SIMS", Kuang Jen Wu, Lawrence Livermore National Laboratory

11:00 - 11:20 PM "ToF-SIMS Analysis of Commercial Hydrogels Using Cryogenic Sample Handling Techniques" Daniel J. Hook, Bausch and Lomb

11:20 - 11:40 PM "Depth Profiling in PLLA/Pluronic Blends using Time-of-Flight Secondary Ion Mass Spectrometry (TOF-SIMS)", Christine Mahoney, NIST

11:40-12:00 PM "Characterization of Peptides in Films and on Beads with C_{60} "Juan Cheng, Penn State

12:00 – 1:00 PM **Lunch**

TOF SIMS - ( )

1:00- 1:20 PM "Investigations of Contamination in the Surface Analysis Lab", Michaelleen L. Pacholski, Rohm and Hass

1:20-1:40 PM "TOF-SIMS Chemical Imaging Applications in the Pharmaceutical Industry", Kurt Wolf, Evans East.

1:40-2:10 " Qualitative Comparison of Bulk and Surface Modifcations of x-Irradiated PTFE, Gregory Fisher, Los Alamos National Lab.

Molecular Dynamics/Fundamentals (Chair: Peter Williams, ASU)

2:30 - 2:50 PM "Formation and Emission of Ions from Water Ice Bombarded by Energetic Particles", Barbara Garrison, Penn State

2:50 - 3:10 PM **"**Microscope Insights into the Sputtering of Ag(111) Induced by C_{60} and Ga^+ Bombardment, Edward Smiley, Penn State University

3:10 - 3:30 PM **"**Principal and Resolved Factors in SIMS Data Interpretation: PCA and MCR" Richard Ericson, 3M

3:30 - 3:50 PM "Dependence of Ion Beam Induced Segregation of Gold in Silicon on the Concentration and Distribution of Near Surface Oxygen", Richard Sobers, ASU

4:00 - 5:30 PM - Poster Session (Chair: TBD)

1. "Application of Time Interpolation to SIMS Isotopic Ratio Measurements" David Simons and Kevin Coakley, NIST
2. "Thermal Stability of Si and Mg-Implanted GaAs and InP under High-energy Laser Annealing as Evaluated by SIMS." Peter Chi, NIST
3. **"**SIMS backside analysis: Sample Preparation and Application" Eric Windsor, NIST
4. "SIMS Support for the Development of BiCMOS process and its Transfer to Manufacturing by Developing in-line Monitoring Capabilities" T. Budri, National Semiconductor
5. "A Comparison of Quadrupole, Magnetic Sector and TOF-SIMS for Sodium Analysis in a Flat Panel Display Glass and in Silica Coated Flat Panel Display Glass", G. Guryanov, Corning.
6. "Determination of Silicon Content in Hafnium Silicates", Joe Bennett, International Sematech
7. "3D Molecular Imaging", Greg Gillen, Matt Wagner, Christine Mahoney, NIST
8. "Initial Results with the ExxonMobil NanoSIMS"
   W.C. Horn, W.A. Lamberti, ExxonMobil Research & Engineering Company

9. Using ToF-SIMS as a High Throughput Screening Tool for Light-Weight Hydrogen Storage Materials, V.S. Smentkowski, and J.P. Lemmon, General Electric Global Research Center

10. "Cluster Primary Ion Bombardment Facilitates ToF-SIMS Analysis of Biological/Tissue samples", V.S. Smentkowski[1], A. Schnieders[2], F. Kollmer[3], R. Kersting[4], J.A. Ohlhausen[5], P.G. Kotula[5], and M.R. Keenan[5], General Electric Global Research Center

11. "Multi-ion Emission from Massive Gold Cluster Impacts"
    G. J. Hager, R. D. Rickman, S. V. Verkhoturov, and E. A. Schweikert
    Texas A&M University

12. "Secondary Ion and Coincidental Ion Yields Produced by keV Polyatomic Carbon Clusters" J. E. Locklear, S.V. Verkhoturov, and E.A. Schweikert, Texas A&M University

13. "SIMS Depth Profiles of SiGe Layers in Fully Processed Si Wafers." Y.H. Lu, Taiwan Semiconductor

14. "Numerical Approach for Resolving Mass Interferences in Ion Mass Spectrometry", Alexander Pivovarov, Shiva Technologies Inc

15. "SIMS Study of Ta/Cu and Co/Cu Nanostructures". R. Liu, Department of Physics, National University of Singapore

16. "Qualitative Comparison of Bulk and Surface Modification of a-Irradiated PTFE", Gregory Fisher, Los Alamos National Laboratory

17. "Comparative Analysis of Pt/Ru Catalyst Sample using TOF-SIMS and Laser SNMS", A. Schnieders, Ion TOF, USA

18. "Fluorine Chamber Contamination in Dynamic SIMS Quadrupole Instruments", C. Blackmer-Krasinki, Micron Technology

Development of a Thermo-Ionization Source for Efficient Imaging of Alkaline Earth Elements and Metal Containing Molecules" Christelle Guillimier

Quantitative Analysis of Hydrogenated Amorphous Silicon-Germanium Alloys, Robert Reedy, NREL

Understanding Oxygen Enhancement of Secondary Ion Yields of Silicon: Comparison of Experimental Results from Si and Theoretical Model, J. Lorincik, ASU

Multiply Charged Molecular Ions Produced by Sputtering, K. Franzreb, ASU

Mapping Applications of Full Wafer SIMS for sub-90nm semiconductor technology, M. Juhel, STM Microelectronics

6:00 PM Workshop Excursion and Dinner – Location to be determined

Thursday, MAY 20, 2004

7:30 - 8:00 AM Continental Breakfast

Imaging (Chairman Greg Gillen-NIST)

8:00- 8:20 AM "NanoSIMS Applications in Catalysis"
W.A. Lamberti, ExxonMobil Research & Engineering Company,

8:20- 8:40 PM "High Spatial Resolution Imaging of Biological Tissues", Claude Lechene, Harvard Medical School

8:40-9:10 PM "Analysis of TOF-SIMS Spectral Series and Spectral Image Series Using AXSIA", Tony Ohlhausen, Sandia National Laboratory

9:10-9:30 PM "Large Area TOF-SIMS Chemical Mapping: Opportunities and Challenges", Kathy Lloyd, Dupont Corporate Center

9:30- 9:50 AM "High Lateral Resolution SIMS in Material Science: Various Applications of the NanoSIMS, F. Horreard, Cameca

9:50- 10:10 Morning Break

Instrumentation Chairman- Steve Hues, Motorola

10:10 - 10:30 AM "Towards Isotope Ratio Measurement with an Electrometer Array on the Cameca IMS xf" Peter Williams, Arizona State University

10:30 - 10:50 AM "Eucentric Rotating Stage for Cameca IMS-wF and Sc-Ultra, P. Peres, Cameca"

10:50 - 11:10 AM "Full Wafer Analysis of Ion Implanted Wafers" Drew Evans, Full Wafer Analysis

11:10 - 11:30 AM "Development of C_{60} Ion Beam Systems", Rowland Hill, Ionoptika

11:30 - 11:50 PM "TOF SIMS Studies Using a Newly Developed C_{60}^{+} Primary Ion Gun: Fundamental Aspects and Applications, Rudolf Mollers, Ion -TOF

11:50-12:10 PM "The Carnegie Super SIMS: A Progress Report", L.R. Nittler, Carnegie Institution

12:10 PM Closing Remarks