

# SURFACE ANALYSIS 2010

## PROGRAM SCHEDULE

32<sup>nd</sup> Annual Symposium on Applied Surface Analysis  
AVS Florida Chapter and Florida Society for Microscopy  
2010 Annual Joint Symposium and Exhibition

March 7-10, 2010, Student Union Building, UCF, Orlando, Florida

### Sunday, March 7, 2010

- 3:00 pm-6:00 pm      Registration UCF Student Union
- 3:30 pm-5:30 pm      **Young Leaders Session**  
Chairs: Andrew Warren (University of Central Florida)  
Travis Kemper (University of Florida)
- 3:30 pm-3:45 pm      **InGaZnO Thin Film Transistors Fabricated on Flexible Substrates**  
E. A. Douglas<sup>1</sup>, Wantae Lim<sup>1</sup>, D. P. Norton<sup>1</sup>, F. Ren<sup>2</sup>, Young-Woo Heo<sup>3</sup>, and S. J. Pearton<sup>1</sup>, <sup>1,2</sup>University of Florida, <sup>3</sup>Kyungpook National University, Korea
- 3:45 pm-4:00 pm      **Composition and Structure of Nitrogen-Containing Dispersoids in Tri-Modal Metal Matrix Composites**  
Clara Hofmeister, Yong-Ho Sohn, University of Central Florida
- 4:00 pm-4:15 pm      **Enhanced Photoluminescence from Gd<sub>2</sub>O<sub>3</sub>:Eu<sup>3+</sup>/Y<sub>2</sub>O<sub>3</sub> Clustered Nanoparticles**  
Jihun Choi, Teng-Kuan Tseng, Mark Davidson and Paul H. Holloway, University of Florida
- 4:15 pm-4:30 pm      **Investigating Filled Double-Walled Carbon Nanotubes via Raman Spectroscopy**  
Tom Hartsfield<sup>1</sup>, Mariana Sendova<sup>1</sup>, Emanuel Flahaut<sup>2</sup>, <sup>1</sup>New College of Florida; <sup>2</sup>Université Paul Sabatier, Toulouse, France
- 4:30 pm-4:45 pm      **Vacuum-Deposited, Multilayer Organic Photodiodes Exhibiting Strong and Fast Photomultiplication**  
William T. Hammond and Jiangeng Xue, University of Florida
- 4:45 pm-5:00 pm      **Thin Film Metastable Intermolecular Composites**  
Daniel Yates, Kevin R. Coffey, University of Central Florida
- 5:00 pm-5:15 pm      **Composition Dependent Spectroscopy and Morphology of Composite P3ht/Pcbm Nanoparticles**  
Zhongjian Hu, Andre J. Gesquiere, University of Central Florida
- 4:00 pm-5:30 pm      **Poster Session (Students only)**  
Coordinator: Mariana Sendova (New College of Florida)
- 5:30 pm-6:30 pm      **FLAVS Student Chapter Invited Lecturer**  
**Renewable Energy, Green Jobs and SunSmart Schools Plus**  
James M. Fenton, Director, Florida Solar Energy Center,  
University of Central Florida, Cocoa, FL
- Student Reception

## Monday, March 8, 2010

- 7:30 am-5:00 pm      **Registration UCF Student Union**
- 8:00 am-9:00 am      **Poster Session (Students only)**  
Coordinator: Mariana Sendova (New College of Florida)
- 9:00 am-9:05 am      **Welcome and Opening Remarks**  
Program Chair: Maggie Puga-Lambers (University of Florida)
- 9:05 am-10:00 am      **Keynote Address**  
**Characterization of Biomolecule Interactions with Surfaces (Invited)**  
David G. Castner, AVS President, University of Washington
- 10:00 am-10:30 am      **Coffee Break (sponsored by RBD Instruments, Inc)**
- 10:30 am-12:00 pm      Renewable Energy I (Alternative Energies)**  
Chairs: Tim Anderson (Florida Program for Alternative Energies, University of Florida)  
Neelkanth Dhere (Florida Solar Energy Center, University of Central Florida)
- 10:30 am-10:55 am      **Material and Device Properties of High-Efficiency CIGS Solar Cells**  
Rommel Noufi, Director, National Renewable Energy Laboratory, USA (Invited)
- 10:55 am-11:20 am      **Interface Effect and Bulk Carrier Transport in Organic Photovoltaic Cells**  
Franky So, University of Florida (Invited)
- 11:20 am-11:45 am      **Solar Thermal Reforming of Hydrocarbons in Catalytic Reticulate Ceramic Foams**  
Joerg Petrasch, University of Florida (Invited)
- 11:45 am-12:00 am      **Influences of Surfaces, Interfaces and Binders in Downconversion Studies to Develop White Light Emitting Diodes**  
Debasis Bera, Sergey Maslov, Lei Qian and Paul H. Holloway, University of Florida
- 12:00 pm-1:00 pm      **Lunch Break**
- 1:00 pm-2:35 pm      New Instrumental Developments and Applications**  
Chair: Mark Davidson (University of Florida)
- 1:00 pm-1:25 pm      **Lateral and Vertical Surface Characterization of Thin-Film Photovoltaics**  
A.J. Roberts, Kratos Analytical Ltd, UK, C. Moffitt, D.J. Surman, Kratos Analytical Inc, USA, J. Pankow, National Renewable Energy Laboratory, USA (Invited)
- 1:25 pm-1:50 pm      **Photoelectron Spectroscopy of PLZT Thin Films For High Power Energy Storage Applications**  
Jeff Terry, Illinois Institute of Technology (Invited)
- 1:50 pm-2:05 pm      **XPS Depth Profiling Of Solid Oxide Fuel Cell Material**  
Paul Mack, Richard White, Thermo Fisher Scientific, UK; H.M. Meyer III, Oak Ridge National Laboratory, USA
- 2.05 pm-2:20 pm      **Photovoltage and Photoconductivity Probed by Dynamical XPS Measurements**  
Hikmet Sezen, Sefik Suzer, Bilkent University, Turkey

- 2:20 pm-2:35 pm      **A Novel Large Area Imaging NEXAFS Spectrometer Enabling Rapid Combinatorial Chemical and Structural Analysis**  
Daniel A. Fischer, Chernojaye, National Institute of Standards and Technology, USA, Kirk Scammon, University of Central Florida, Peter Sobol, Edward Principe, Synchrotron Research, Inc., Florida Institute of Technology
- 2:35 pm-3:00 pm      **Coffee Break (sponsored by Kratos Analytical, Inc)**
- 3:00 pm-4:30 pm      Advances in Scanning Ion and Secondary Electron Microscopy**  
Chair: Lucille Giannuzzi (FEI Company, USA)
- 3:00 pm-3:25 pm      **Helium Ion Microscopy**  
David C. Bell, Harvard University (**Invited**)
- 3:25 pm-3:50 pm      **An Inductively Coupled Plasma Ion Source for High Resolution Surface Analysis and Engineering**  
Noel S. Smith, P. P. Tesch, N. P. Martin and R. W. Boswell, Oregon Physics LLC, USA (**Invited**)
- 3:50 pm-4:15 pm      **Extreme High Resolution Scanning Electron Microscopy (XHR SEM) using a Monochromator**  
Richard J. Young, FEI Company, USA (**Invited**)
- 4:15 pm-4:30pm      **Emerging SEM Technology to Advance Energy Research**  
Natasha Erdman, Naoki Kikuchi, Regina Campbell, and Vernon E. Robertson, JEOL USA Inc
- 4:30 pm-7:00 pm      Poster Session**  
Coordinator: Mariana Sendova (New College of Florida)
- Reception (Sponsored by Thermo Fisher Scientific)

## Tuesday, March 9, 2009

- 8:00 am-5:00 pm      **Registration UCF Student Union**
- 8:30 am-10:10 am      Renewable Energy II (Photovoltaics)**  
Chairs: Neelkanth Dhere (Florida Solar Energy Center, University of Central Florida)  
Tim Anderson (Florida Program for Alternative Energies, University of Florida)
- 8:30 am-8:55 am      **Thin Film PV Research Program at USF**  
Chris Ferekides, University of South Florida (**Invited**)
- 8:55 am-9:20 am      **Research in the National Center for Photovoltaics at NREL: Past, Present, and Future**  
Ryne P. Raffaele, Director, National Center for Photovoltaics, National Renewable Energy Laboratory, USA (**Invited**)
- 9:20 am-9:45 am      **The Surface Science of Cu(In,Ga)Se<sub>2</sub>**  
Angus Rockett, University of Illinois (**Invited**)
- 9:45 am-10:10 am      **Lead for Solar System Integration**  
Kevin Lynn, US Department of Energy (**Invited**)
- 10:10 am-10:40 am      **Coffee Break (Sponsored by JEOL USA, Inc)**

10:40 am-12:00 pm	<b>Depth Profiling, Quantification and Data Interpretation</b> Chair: Chris Szakal (National Institute of Standards and Technology)
10:40 am-11:05 am	<b>3D TOF-SIMS Imaging of Organic and Inorganic Specimens with FIB Sectioning and C<sub>60</sub> Ion Polishing</b> <u>Gregory L. Fisher</u> <sup>1</sup> , Christopher Szakal <sup>2</sup> , Greg Gillen <sup>2</sup> , and Scott R. Bryan <sup>1</sup> , <sup>1</sup> Physical Electronics, USA, <sup>2</sup> NIST, USA (Invited)
11:05 am-11:20 am	<b>ToF-SIMS Depth Profiles of Enzymatically Degraded Poly(peptide urethaneureas)</b> <u>Gilad Zorn</u> , Felix I. Simonovsky, Jeremy Brison, Buddy D. Ratner and David G. Castner, University of Washington
11:20 am-11:35 pm	<b>MCs<sub>x</sub><sup>+</sup> Depth Profiling using Cluster Primary Ions</b> E. Niehuis, F. Kollmer, R. Moellers, D. Rading, ION-TOF GmbH, Germany; R. Kersting, B. Hagenhoff, TASCAN GmbH, Germany; <u>A. Schnieders</u> , TASCAN USA, Inc., ION-TOF USA, Inc.; N. Havercroft, ION-TOF USA, Inc.
11:35 am-12:00 pm	<b>Problems with Data Acquisition and Processing in X-ray Photoelectron Spectroscopy</b> John T. Grant, University of Dayton (Invited)
12:00 pm-1:00 pm	Lunch Break
1:00 pm-1:45 pm	<b>Depth Profiling, Quantification and Data Interpretation</b> Chair: Chris Szakal (National Institute of Standards and Technology)
1:00 pm-1:15 pm	<b>Application of an Improved Maximum Entropy Method (MEM) Algorithm for the Analysis and Interpretation of Angle Resolved XPS Results</b> G. Mishra, K. Mcack, Kratos Analytical Ltd, Manchester, UK; <u>C. Moffitt</u> , Kratos Analytical Inc, USA
1:15 pm-1:30 pm	<b>Reconstruction of Depth Profiles from Angular and Energy Distribution of Photoelectron</b> <u>G. Tasneem</u> , W.S.M Werner, W.Smekal, Vienna University of Technology, Austria
1:30 pm-1:45 pm	<b>Spectroscopic Analysis of High Temperature Electrical Contacts on SiC Using AES and FIB FE-SEM</b> <u>Dorothy Lukco</u> , ASRC Aerospace Inc., USA; Robert S. Okojie, NASA Glenn Research Center, USA and Chuck Blaha, Jacobs Sverdrup, USA
1:45 pm-2:50 pm	<b>Characterization of Nano/Bio Materials</b> Chair: Swadesh Santra (University of Central Florida)
1:45 pm-2:10 pm	<b>Redox-active Radical Scavenging Nanomaterials</b> Ajay Karakoti, Sanjay Singh, Janet M. Dowding, Sudipta Seal and <u>William T. Self</u> , University of Central Florida (Invited)
2:10 pm-2:35 pm	<b>Surprisingly Long-Range Surface Enhanced Raman Scattering (SERS) on Au-Ni Multisegmented Nanowires</b> David Wei, University of Florida (Invited)
2:35 pm-2:50 pm	<b>Optical Interactions and Energy Transfer in Silver Nanocomposite Glasses</b> <u>J. A. Jiménez</u> , M. Sendova, New College of Florida; S. Lysenko, H. Liu, University of Puerto Rico
2:50 pm-3:10 pm	Coffee Break (Sponsored by <u>Physical Electronics, Inc</u> )

3:10 pm-4:15 pm	<b>Optical Techniques for Applied Surface Analysis</b> Chair: Andre Gesquiere (University of Central Florida)
3:10 pm-3:35 pm	<b>Optical Spectroscopy for Stress Measurements in Aerospace Materials</b> Seetha Raghavan, University of Central Florida (Invited)
3:35 pm-4:00 pm	<b>Plasmon Enhanced Near-Field Interactions in Metallic Nanostructures and Devices</b> Pieter G. Kik, University of Central Florida (Invited)
4:00 pm-4:15 pm	<b>Studies of Molecular Mechanisms of Adsorption and Surface Chemical Reactions of Aromatic vs. Thioaromatic Compounds by the Combination of the Surface and Bulk-Sensitive Operando UV-VIS Diffuse Reflectance Spectroscopy (DRS) and Operando ESR</b> <u>Alexander Samokhvalov</u> , Evert C. Duin, and Bruce J. Tatarchuk, Auburn University
4:15 pm-4:45 pm	<b>Student Poster Competition Award Ceremony</b> Coordinator: Mariana Sendova (New College of Florida)
5:00 pm-6:30 pm	<b>ASTM E-42 Meeting</b>

## Wednesday, March 10, 2010

8:00 am-3:00 pm	Registration UCF Student Union
8:00 am-10:10 am	<b>Microscopy in the Physical and Biological Sciences</b> Chairs: Helge Heinrich (University of Central Florida) Tony Greco (University of South Florida)
8:00 am-8:25 am	<b>Microscopy and Spectroscopy for probing Nanomaterials</b> <u>Qi Zhang</u> , Kirk Scammon, Mikhail Klimov, Karen Glidewell, Yong-ho Sohn, University of Central Florida (Invited)
8.25 am-8.40 am	<b>X-Ray Microanalysis: reporting Successful Stories featuring Solar Cells and Biological Materials</b> Breno Leite, Thermo Fisher Scientific, USA
8:40 am-9:05 am	<b>How to use Electron Microscopy to teach Sustainability in Engineering</b> Luisa Amelia Dempere, University of Florida (Invited)
9:05 am -9:30 am	<b>Elucidating Property-Structure Relationships of Biological Systems: Implications for Alzheimer's Disease, Flocculation And Drug Delivery Systems</b> Norma A. Alcantar, University of South Florida (Invited)
9.30 am-9.45 am	<b>A Comprehensive Method for the Chemical Mapping of Single Cells with Imaging Mass Spectrometry</b> <u>Christopher Szakal</u> , <sup>a</sup> Kedar Narayan, <sup>b</sup> Jing Fu, <sup>b</sup> Jonathan Lefman, <sup>a</sup> and Sriram Subramaniam <sup>b</sup> , <sup>a</sup> National Institute of Standards and Technology, <sup>b</sup> National Institutes of Health, USA
9:45 am-10:10 am	<b>Biological EM in the 21<sup>st</sup> Century: Cryotechniques, Correlative LM/EM, and Cellular Tomography</b> Kent L. McDonald, University of California at Berkeley (Invited)
10:10 am-10:30 am	Coffee Break (Sponsored by <u>Turbo Vacuum</u> )

<b>10:30 am-12:00 pm</b>	<b>Computational Modeling of Surfaces</b> Chair: Susan Sinnott (University of Florida)
10:30 am -10:55 am	<b>Computational Modeling of Surfaces</b> Patrick Schelling, University of Central Florida (Invited)
10:55 am-11:20 am	<b>Graphitic Nanostructured Materials: Electronic Structure and Mutual Interaction Effects</b> Lilia Woods, University of South Florida (Invited)
11:20 am-11:45 am	<b>Nanoscale Morphology of a Surface Layer of Metal Irradiated by Femtosecond Laser Pulse</b> Vasily V. Zhakhovsky, University of South Florida (Invited)
11:45 am-12:00 am	<b>Electronic Transport Properties in Arrays of DNA Segments</b> <u>E. L. Albuquerque</u> and L. R. da Silva, Universidade Federal do Rio Grande do Norte, Brazil
12:00 pm-1:00 pm	Lunch Break
<b>1:00 pm-2:20 pm</b>	<b>Surface Science</b> Chair: Beatriz Roldan (University of Central Florida)
1.00 pm-1:25 pm	<b>Selectivity and Reactivity of Oxide Surfaces: Insights from Theory and Modeling</b> Talat Rahman, University of Central Florida (Invited)
1:25 pm-1:50 pm	<b>Characterization and Chemical Activity of Au-Based Bimetallic Clusters on TiO<sub>2</sub> (110)</b> Samuel A. Tenney, Wei He, and <u>Donna A. Chen</u> , University of South Carolina (Invited)
1:50 pm-2:15 pm	<b>Control of Molecular Motion at Surfaces</b> Ludwig Bartels, University of California at Riverside (Invited)
2:15 pm-2:35 pm	Coffee Break
<b>2:35 pm-4:15 pm</b>	<b>Thin Films</b> Chair: Ashok Kumar (University of South Florida)
2:35 pm-3:00 pm	<b>Organic and Hybrid Organic-Inorganic Thin Films for Light-Emitting Devices</b> Jiangeng Xue, University of Florida (Invited)
3:00 pm-3:25 pm	<b>Nano Carbon Materials for Multifunctional Application</b> Wonbong Choi, Florida International University (Invited)
3:25 pm-3:50 pm	<b>Diamond Thin Films for RF MEMS Applications</b> Jing Wang, University of South Florida (Invited)
3:50 pm-4:15 pm	<b>Impact of the Er-to-Ni Thickness Ratio on the Formation of Er-Ni Silicide</b> <u>Pui Yee Hung</u> <sup>1</sup> , Wei-Yip Loh <sup>1</sup> , Joel Barnett <sup>1</sup> , Kelly Radar <sup>1</sup> , Pat Lysaght <sup>1</sup> , Prashant Majhi <sup>1,2</sup> , Bill Taylor <sup>1</sup> , Rajarao Jammy <sup>1</sup> , <sup>1</sup> SEMATECH, Albany, NY, <sup>2</sup> Intel assignee, SEMATECH, Austin, TX