



# CDMMS MEETING

General Electric Global Research Center  
Thursday, March 10<sup>th</sup>, 2011  
6:00-8:00pm

Cost: \$5 students, \$10 members, \$20 non-members (\$5 to attend talk only)  
New membership and/or renewal membership dues will also be collected at this time:  
\$25 for professionals and \$10 for students

**PLEASE EMAIL IAN TO RSVP BY MARCH 3<sup>RD</sup>**  
[spinelli@ge.com](mailto:spinelli@ge.com)

## AGENDA

Social hour and buffet dinner at 6:00pm  
Talk by Dr. Vincent S. Smentkowski at 7:00pm

## MENU

Large Fruit Platter  
California Mixed Salad  
Lasagna  
Grilled Sesame Chicken Salad  
American Cookie Platter  
Assorted Sodas

## TALK

Surface Microscopy and Microanalysis in an Industrial Research and Development  
Laboratory: General Electric Global Research Center

### **Vincent S. Smentkowski**

The top few nanometers of a sample is defined as the surface. The surface is where most chemical reactions take place. There are many instances where the surfaces of materials are designed/functionalized in order to optimize the properties and improve device performance. Auger Electron Spectroscopy (AES), X-ray Photoelectron Spectroscopy (XPS), Time of Flight Secondary Ion Mass Spectrometry (ToF-SIMS) and Scanning Probe Microscopy (SPM) are the four most common, and commercially available, surface analysis techniques. These techniques provide complimentary information regarding the composition/microstructure of the surface of a sample. As an analyst in an industrial characterization organization, we obtain a variety of “real-life” samples that need to be analyzed including, but not limited to, nanomaterials, thin films, polymers with high mass molecular additives, metallographic samples, as well as biological specimens. The talk will start with an overview of the GE Global Research Center in order to define the mission of the research center and to illustrate the range of internal programs and materials that we are using (and need to be characterized). I will then describe data sets that were collected on a diverse range of GE materials in order to demonstrate the information obtained when surface analysis instruments are utilized.



Dr. Vincent S. Smentkowski joined GE Global Research in 1997. He is presently a Senior Scientist in the characterization organization. His areas of expertise include ToF-SIMS, and the applications of multivariate statistical analysis (MVSA) techniques to reduce the dimensionality of complex data sets. Vin is also evaluating novel microstructural characterization techniques including atom probe tomography and the helium ion microscope. Prior to joining GE, Vin held a post-doctorial appointment at Argonne National Laboratories where he was part of a team that designed, built, and tested ion scattering instrumentation for real-time, in-situ, surface analysis of thin films during deposition at mTorr pressures. This work resulted in a 1997 R&D 100 Award. Vin obtained his Ph.D. in physical chemistry from the University of Pittsburgh under the guidance of Prof. John T. Yates Jr. Vin is the 2009-2010 founding chair of the Hudson Mohawk Chapter of the American Vacuum Society (AVS), the 2011 chair of the Applied Surface Science Division of AVS, and the co-chair of the 33<sup>rd</sup> Annual Symposium on Surface Analysis\*. Vin served as the co-chair for the 2006, 2008, and 2010 surface analysis symposia at the Microscopy and Microanalysis meetings. Recently, Vin was appointed the MAS co-chair for the 2012 Microscopy and Microanalysis meeting. The March 2011 issue of *Microscopy Today* is dedicated to surface analysis; Vin served as the first guest editor for this issue. Vin holds 6 US Patents, 78 externally published papers, 80 internal GE reports, and numerous invited talks. In 2010 Vin was appointed a Fellow of AVS “for exceptional contributions in the field of industrial surface analysis, including multivariate statistical analysis of ToF-SIMS data”.

\* <https://www2.avs.org/divisions/assd/SurfaceAnalysis2011/default.html>



For more information, please visit: [www.CDMMS.org](http://www.CDMMS.org)

