



**MICROSCOPY SOCIETY OF
NORTHEASTERN OHIO, INC.**

An affiliate society of the Microscopy Society of
America and the Microanalysis Society



MSNO 2017 WINTER MEETING

3:00 – 7:15 p.m., Wednesday, March 1st, 2017,
NORD 356 - CWRU Biomedical Engineering
Dept.
Cleveland , OH 44106

Registration, Vendor Exhibitions and Tours	3:00 – 4:30 PM	Registration Vendor Exhibitions FES center tours
Welcoming Remarks	4:30 – 4:45 PM	
Presentation 1 <i>Surface Microscopy and Microanalysis in an Industrial Research and Development Laboratory: General Electric Global Research Center</i>	4:45 – 5:30 PM	Dr. Vincent S. Smentkowski <i>GE-Global Research, Niskayuna, NY 12309 (MAS Tour Speaker)</i>
Dinner	5:30 – 6:30 PM	
Presentation 2 <i>The application of Functional Electrical Stimulation to restore joint motion in individuals with Spinal Cord Injury and other movement disorders</i>	6:30 – 7:15 PM	Jim Uhlir <i>Operations Manager Cleveland FES Center Technical Development Laboratory CWRU Biomedical Engineering Dept.</i>

Please register online at <http://www.msneo.org/2017-Winter-meeting-registration.html> by **Friday, 2/24/2017 at noon.**

Registration is \$20 for members, \$25 for non-members, \$5 for student members, \$10 for student non-members.

A limited number of onsite registrations are available for an additional \$10 cost.

2017 MSNO Winter Meeting Program



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

Vincent S. Smentkowski
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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 surface of materials are designed/functionalized in order to optimize properties and improve device performance; there are other instances where the surface becomes compromised and the material/device performance degrades. Auger Electron Spectroscopy (AES), X-ray Photoelectron Spectroscopy (XPS), and Time of Flight Secondary Ion Mass Spectrometry (ToF-SIMS) are the three most common, and commercially available, surface analysis techniques. These techniques provide complimentary information regarding the composition/microstructure of the surface of a sample. In this presentation, we will introduce AES, XPS, and ToF-SIMS, show typical data, and discuss how the data helped understand mechanisms and/or resolve material problems. We will also introduce techniques which we do not have in-house, but have access to via external collaborations.

Vincent S. Smentkowski obtained a B.S. degree in chemistry from Marshall University in 1987 and a Ph.D. in Physical Chemistry (1994) from the University of Pittsburgh, under the guidance of Prof. John T. Yates, Jr. After completing his degree, Vin accepted a post-doctoral position at Argonne National Laboratory where he designed, built, and tested a novel reflectron analyzer in order to perform Ion Scattering and Recoil Spectrometry (ISARS) measurements of surfaces during thin film growth at ambient pressure. Vin is currently a Senior Scientist in the Nanostructures and Surfaces Laboratory at General Electric Global Research (GEGR) where he performs surface analysis to support research programs at GEGR, GE businesses, and strategic partners. Vin's research is focused on the applications of ToF-SIMS analysis, emphasizing how multivariate statistical analysis tools facilitate data reduction. He also collaborates with external laboratories in order to evaluate advanced microstructural characterization techniques such as Atom Probe Tomography and Helium Ion Microscopy and show the benefits these techniques have for industrial materials.



The application of Functional Electrical Stimulation to restore joint motion in individuals with Spinal Cord Injury and other movement disorders

Jim Uhlir, MS, MBA
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Paralysis, through Spinal Cord Injury (SCI) or stroke, is a devastating condition that leaves the person without the ability to move their hands and/or legs. These people become dependent on their family, a

spouse, or a caregiver for help in completing their daily activities. Since 1986, the Cleveland FES Center has collaborated with CWRU, MetroHealth Medical Center, The Cleveland VA Medical Center, and University Hospitals to develop implantable solutions which provide individuals with SCI more independence in their daily lives. The Technical Development Laboratory designs, develops, and fabricates the neuro stimulation hardware, while the clinical FESC investigators implant and clinically evaluate how effectively these systems restore function to paralyzed individuals. To date, there have been over 250 implanted systems deployed around the world to restore both upper and lower extremity function in individuals with paralysis.

Mr. Uhlir has been with the Cleveland FES Center in various roles for over 20 years. He has been the Operations Manager of the Technical Development Laboratory since 2002, where he has helped spin-out 8 technologies to local start-up neuro stimulation companies. He has an MS in Biomedical Engineering, and an MBA in Bioscience Entrepreneurship – both from CWRU. He also served nearly 10 years as a Navy Submarine Officer, where he earned an MS equivalent in Nuclear Engineering.

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