

Surface and Microanalysis Science Division

Outputs and Interactions

1. Publications

1a. Publications in Print

Coplen, T.B., Brand, W.A., Gehre, M., Groening, M, Meijer H.A.J., Toman, B., Verkouteren, R.M., ***“New Guidelines for ¹³C Measurements,”*** Anal. Chem., 78, 2439-2441 (2006).

Batteas, J.D., Garno, J.C., Xu, C., Bazzan, G., and Drain, C.M., ***“Designing Supramolecular Porphyrin Arrays for Surface Assembly and Patterning of Optoelectronic Materials,”*** Metal-Containing and Metallosupramolecular Polymers and Materials, ACS Symposium Series 928, 168-183 (2006).

Beebe, J.M., Kim, B.S., Gadzuk, J.W., Frisbie, C.D., and Kushmerick, J.G., ***“Transition from Direct Tunneling to Field Emission in Metal-Molecule-Metal Junctions,”*** Physical Review Letters, 97, 026801 (2006).

Dobbins, R.A., Fletcher, R.A., Benner, B., and Hoeft, S., ***“Polycyclic Aromatic Hydrocarbons in Flames, In Diesel Fuels, and in Diesel emissions,”*** Flame and Combustion, 144, 773-781 (2006).

Egelhoff, W. F., Jr., McMichael, R. D., Dennis, C. L., Stiles, M. D., Johnson, F., Shapiro, A. J., Maranville, B. B., and Powell, C. J., ***“Soft Magnetic Layers for Low-Field-Detection Magnetic Sensors,”*** Thin Solid Films 505, 90 (2006).

Egelhoff, W. F., Jr., McMichael R. D., Dennis, C. L., Stiles, M. D., Shapiro, A. J., Maranville, B. B., and Powell, C. J., ***“Suppression of Orange-Peel Coupling in Magnetic Tunnel Junctions by Pre-Oxidation,”*** Appl. Phys. Letters 88, 162508 (2006).

Fletcher, R.A., ***“Reducing Uncertainty in Particle Size Measurement for Liquid Filter Testing,”*** Proceeding of the American Filtration and Separation Society Meeting Filtration, 6(2), 140-145 (2006).

Holbrook, R.D., DeRose, P.C., Leigh, S.D., Rukhin, A.L., and Heckert, N.A., ***“Excitation-Emission Matrix Fluorescence Spectroscopy (EEM) for Natural Organic Matter Characterization – A Quantitative Evaluation of Calibration and Spectral Correction Procedures,”*** Applied Spectroscopy, 60(7), 791-799 (2006).

Holbrook, R.D., Yen, J.H., and Grizzard, T.J., ***“PARAFAC Modeling of Organic Matter Derived from Surface Water Samples within the Occoquan Watershed (Northern Virginia, US),”*** Science of the Total Environment, 361(1-3), 249-366 (2006).

Holbrook, R.D., Wagner, M.S., Mahoney, C.M., and Wight, S.A., ***“Investigating Activated***

Sludge Flocs using Microanalytical Techniques: Demonstration of ESEM and ToF-SIMS for Wastewater Applications, Water Environment Research, 78(4), 381-387 (2006).

Jablonski, A., Tanuma, S., and Powell, C. J., ***“New Universal Expression for the Electron Stopping Power for Energies between 200 eV and 30 keV,”*** Surf. Interface Anal. 38, 76 (2006).

Jablonski, A., Tanuma, S., and Powell, C. J., ***“A Predictive Formula for the Electron Stopping Power,”*** Journal of Surface Analysis, 13, 170 (2006).

Jablonski, A. and Powell, C. J., ***“A Universal Algorithm for Calculating the Backscattering Factor in Quantitative Auger Electron Spectroscopy,”*** Surf. Science, 601, 965 (2007).

Jach, T.J., Durbin, S., Kim, S., and Gopalan, V., ***“Observations of 180° Ferroelectric Domains through Lithium Niobate using Bragg and Laue X-ray Topography with the Application of Electric Fields,”*** Ceramics Transactions 196, 119 (2006).

Jach, T.J., Bakulin, A.S., Durbin, S.M., Pedulla, J., and Macrander, A.T., ***“Variable Magnification of Kirkpatrick-Baez Optics for Synchrotron X-ray Absorption Microscopy,”*** Journal of Research, Natl. Inst. Stand. Technol. 111, 219 (2006).

Kushmerick, J.G., Blum, A.S., and Long, D.P., ***“Metrology for Molecular Electronics,”*** Analytica Chimica Acta, 568, 20-27 (2006).

Kover, L., and Powell, C. J., ***“Report on the 42nd IUVSTA Workshop Electron Scattering in Solids: From Fundamental Concepts to Practical Applications,”*** Surf. Interface Anal. 38, 88 (2006).

Newbury, D.E., ***“X-ray Spectrometry and Spectrum Image Mapping at Output Count Rates above 100 kHz with a Silicon Drift Detector on a Scanning Electron Microscope,”*** Scanning, 27, 227-239 (2005).

Newbury, D.E., and Myklebust, R.L., ***“Simulation of Electron-excited X-ray Spectra with NIST-NIH Desktop Spectrum Analyzer (D TSA),”*** Surface and Interface Analysis, 37, 1045-1053 (2005).

Newbury, D.E., ***“Misidentification of Major Constituents by Automatic Qualitative Energy Dispersive X-ray Microanalysis: A Problem that Threatens the Credibility of the Analytical Community,”*** Microscopy and Microanalysis, 11, 545-561 (2005).

Newbury, D.E., ***“The New X-ray Mapping: X-ray Spectrum Imaging above 100 kHz Output Count Rate with the Silicon Drift Detector,”*** Microscopy and Microanalysis, 12, 26-35 (2006).

Newbury, B.D., Notis, M.R., and Newbury, D.E., ***“Revisiting the Zinc Composition Limit of Cementation Brass,”*** Historical Metallurgy, 39, Part 2, 75-81 (2005).

Novotny, L., and Stranick, S.J., "***Near-Field Optical Microscopy and Spectroscopy with Pointed Probes***," *Annu. Rev. Phys. Chem.*, 57, 303-331 (2006).

Powell, C. J., and Jablonski, A., "***Dependence of Calculated Electron Effective Attenuation Lengths on Transport Mean Free Paths Obtained from Two Atomic Potentials***," *Surf. Interface Anal.* 38, 1348 (2006).

Powell, C. J., Werner, W. S. M., and Smekal, W., "***Refined Calculations of Effective Attenuation Lengths for SiO₂ Film Thicknesses by X-ray Photoelectron Spectroscopy***," *Appl. Phys. Letters* 89, 252116 (2006).

Powell, C. J., Werner, W. S. M., and Smekal, W., "***Distinguishability of N Composition Profiles in SiON Films on Si by Angle-Resolved X-ray Photoelectron Spectroscopy***," *Appl. Phys. Letters* 89, 172101 (2006).

Schultz, Z.D., Gurac, M.C., and Richter, L.J., "***Broadband Coherent anti-Stokes Raman Spectroscopy Characterization of Polymer Thin Films***," *Applied Spectroscopy* 60(10), 1097-1104 (2006).

Seferos, D.S., Blum, A.S., and Kushmerick, J.G., "***Single-Molecule Charge Transport Measurements that Reveal Technique-Dependant Perturbations***," *Journal of the American Chemical Society*, 128, 11260-11267 (2006).

Stapleton, H.M., Brazil, B., Holbrook, R.D., Benedict, R., Konstantinov, A., and Mitchelmore, K.L., "***In Vivo and In Vitro Debromination of Decabromodiphenyl Ether (BDE 209) by Juvenile Rainbow Trout and Common Carp***," *Environmental Science and Technology*, 40(15), 4653-4658 (2006).

Verkouteren, R.M., Gillen, G., and Taylor, D.W., "***Piezoelectric Trace Vapor Calibrator***," *Rev. Sci. Instrum.*, 77, 085104 (2006).

Wight, S. A., and Powell, C. J., "***Evaluation of the Shapes of Auger- and Secondary-Electron Linescans across Interfaces with the Logistic Function***," *J. Vac. Sci. Tech. A* 24, 1024 (2006).

Yi, T., Harper, Jr., W.F., Holbrook, R.D., and Love, N.G., "***The Role of Particle Size and Nitrification in removal of 17-ethinylestradiol in Bioreactors***," *Journal of Environmental Engineering - ASCE*. 132(11), 1527-1529 (2006).

Yu, L.H., Zangmeister, C.D., and Kushmerick, J.G., "***Probing Structural Contributions to Charge Transport across Ni-Octanedithiol Multilayer Junctions***," *Nano Letters*, 6, 2515-2519 (2006).

Walker, M.L., Richter, L.J., and Moffat, T.P., "***Competitive Adsorption of PEG/Cl-(SPS/MPS) on Cu: An In-Situ Ellipsometric Study***," *Journal of the Electrochemical Society*, 153(8), C557-C561 (2006).

Zangmeister, C.D., Robey, S.W., van Zee, R.D., Kushmerick, J.G., Naciri, J., Yao, Y., Tour, J.M., Varughese, B., Xu, B., and Reutt-Robey, J.E., ***“Fermi Level Alignment in Self-assembled Molecular Layers: the Effect of Coupling Chemistry,”*** Journal of Physical Chemistry B, **110**, 17138-17144 (2006).

1b. Manuscripts In Press

Anderson, I.M., ***“A Method for Partially Incoherent Imaging of Crystalline Specimens in Conventional TEM,”*** Ultramicroscopy, (in press).

Chesnick, I., Todorov, T., Centeno, J., Newbury D.E., Small, J.A., and Potter, K., ***“Manganese-Enhanced Magnetic Resonance Microscopy of Mineralization,”*** Journal of Magnetic Resonance Imaging, (in press).

Currie, L.A., ***“On the Detection of Rare, and Moderately Rare, Nuclear Events,”*** Journal of Radioanalytical and Nuclear Chemistry, (in press).

Fahey, A., J., Gillen, J.G., Chi, P., and Mahoney, C.M., ***“Performance of a C₆₀ + Ion Source on a Dynamic SIMS instrument,”*** Applied Surface Science, (in press).

Gillen, J.G., Batteas, J.D., Michaels, C.A., Chi, P.H., Small, J.A., Windsor, E.S., Fahey, A.J., Verkouteren, J.R., and Kim, K.J., ***“Depth Profiling Using C₆₀ + SIMS – Deposition and Topography Development During Bombardment of Silicon,”*** Applied Surface Science, (in press).

Gillen, G., Wight, S., Mahoney, C., and Lareau, R., ***“Characterization of High Explosive Particles Using cluster Secondary Ion Mass Spectrometry,”*** Rapid Communications in Mass Spectrometry, (in press).

Gu, X., Votruba-Drzal, P.L., Michaels, C.A., Jasmin, J., Martin, D., Nguyen, T., and Martin, J.W., ***“Mechanical and Depth Profiling of UV-Degraded Polymeric Systems Using Nanoindentation and Micro-FTIR Imaging,”*** Proc. Adhesion. Soc., (in press).

Gu, X., Michaels, C.A., Votruba-Drzal, P.L., Jasmin, J., Martin, D., Nguyen, T. and Martin, J.W., ***“Probing Photodegradation Beneath the Surface: A Depth Profiling Study of UV-degraded Polymeric Coatings with Micro-Chemical Imaging and Nanoindentation,”*** Proc. Int. Coat. Exp. (in press).

Gurau, M.C., Delongchamp, D.M., Vogel, B.M., Lin, E., Fischer, D.A., and Sambasivan, L.J., ***“Ordering in Poly (3-alkylthiophene) Thin Films Determined with Polarized Optical Spectroscopies,”*** (in press).

Jach, T.J., Ritchie, N., Ullom, J., and Beall, J. ***“Quantitative Analysis with the Transition Edge Sensor Microcalorimeter X-ray Detector,”*** Advances in X-Ray Analysis, (in press).

Kim, K.J., Simons, D.S., and Gillen, J.G., ***“Quantitative Depth Profiling of an Alternating Pt/Co Multilayer and a Pt-Co Alloy Multilayer by SIMS using a Buckminsterfullerene C₆₀,”*** Applied Surface Science, (in press).

Kim, K.J., Moon, D.W., Park, C.J., Simons, D.S., Gillen, J.G., Jin, H., and Kang, H.J., ***“Quantitative Surface Analysis of Fe-Ni Alloy Films by XPS, AES and SIMS,”*** Surface and Interface Analysis, (in press).

Mahoney, C.M., Gillen, G., and Fahey, A.J. ***“Temperature-Controlled Depth Profiling in Poly (methylmethacrylate) (PMMA) Using Cluster SIMS: I. Investigation of Depth Profile Characteristics,”*** Analytical Chemistry, (in press).

Mahoney, C.M., Gillen G., Fahey, A.J., Xu, C., and Batteas, J.D., ***“Temperature-Controlled Depth Profiling in Poly methylmethacrylate (PMMA) Using Cluster SIMS II. An Investigation of Sputter-Induced Topography, Chemical Damage and Depolymerization Effects,”*** Analytical Chemistry, (in press).

Mahoney, C.M., and McDermott, M.K. ***“Characterization of drug-eluting Stent (DES) materials with SIMS,”*** Applied Surface Science, (in press).

Mahoney, C.M., Yu, Jinxiang, Fahey, A.J., and Gardella, J.A., Jr., ***“SIMS Depth Profiling of Polymer Blends with Protein Based Drugs,”*** Applied Surface Science, (in press).

Michaels, C.A., ***“Mid-Infrared Imaging with a Solid Immersion Lens and Broadband Laser Source,”*** App. Phys. Lett. (in press).

New bury, D.E., ***“Developments in Instrumentation for X-ray Microanalysis in Low Voltage Scanning Electron Microscopy,”*** Developments in Instrumentation for X-ray Microanalysis in Low Voltage Scanning Electron Microscopy, (in press).

Simons, D.S., and Lindstrom, R.M., ***“Round Robin of Arsenic Implant Dose Measurement in Silicon by SIMS,”*** International Conference on Secondary Ion Mass Spectrometry, Proceedings 15th Applied Surface Science, (in press).

Simons, D.S., ***“Summary of ION/TC 201 Standard: XIII. ISO 18114: 2003 – Surface Chemical Analysis –Secondary Ion Mass Spectrometry – Determination of Relative Sensitivity Factors from Ion-Implanted Reference Materials,”*** Surface and Interface Analysis, (in press).

Sung, L.P., Michaels, C.A., Forster, A., Comer, J., Lucas, J., and Votruba-Drzal, P.L., ***“Correlating Surface Morphology to Damage Response in Polymer Coatings through Instrumented Scratch Testing,”*** Proc. Int. Coat. Exp. (in press).

Turner, S., Sieber, J.R., Vetter, T.W., Zeisler, R., Marlow, A.F., Moreno-Ramirez, M.G., Davis, M.E., Kennedy, G.J., Borghard, W.G., Yang, S., Navrotsky, A., Toby, B.H., Kelly, J.F., Fletcher, R.A., Windsor, E.S., Verkouteren, J.R., and Leigh, S.D, ***“Characterization of Chemical Properties, Unit Cell Parameters and Particle Size Distribution of Three Zeolite Reference***

Materials: RM 8850 Zeolite Y, RM 8851 Zeolite A and RM 8852 Ammonium ZSM 5 Zeolite,” Microporous and Mesoporous Materials Journal, (in press).

Verkouteren, R.M., Windsor, E.S., Fletcher, R.A., Maditz, R., Smith, W.P., and Gillen, J.G., **“Inkjet Metrology and Standards for Ion Mobility Spectrometry,”** International Journal of Ion Mobility Spectrometry, (in press).

Walker, M.L., Richter, L.J., and Moffat, T.P., **“Potential Dependence of Competitive Adsorption of PEG, Cl⁻, and SPS/MPS on Cu: An In Situ Ellipsometric Study,”** Journal of the Electrochemical Society, (in press).

2. Talks

Anderson, I.M., and Scott, J., **“Pre-Meeting Workshop: Low Voltage XEDS,”** Australian Conference on Microscopy and Microanalysis, Sydney, Australia, February 5, 2006. Invited

Anderson, I.M., **“EFTEM Spectral Imaging: Robust Qualitative Analysis at the Nanometer Scale,”** Australian Conference on Microscopy and Microanalysis, Sydney, Australia, February 7, 2006. Invited

Anderson, I.M., **“Large Angular Convergence Scanned Beam Illumination (LACSBI): Mitigation of Unwanted Diffraction Effects in TEM Imaging,”** Cornell Workshop, Ithaca, NY July 18, 2006.

Anderson, I.M., **“Large Angular Convergence Scanned Beam Illumination (LACSBI): Mitigation of Unwanted Diffraction Effects in TEM Imaging,”** Microscopy and Microanalysis Meeting, Chicago, IL, July 31, 2006.

Anderson, I.M., Scott, J., and Levine, Z., **“Three-Dimensional Nanoscale Chemical Imaging via EFTEM Spectral Imaging,”** Microscopy and Microanalysis Meeting, Chicago, IL, August 2, 2006.

Anderson, I.M., Scott, J., Klein, K., Melechko, A., and Simpson, M., **“Screening of Individual Nanostructures with STEM-EELS and EFTEM Spectral Imaging,”** Microscopy and Microanalysis Meeting, Chicago, IL, August 3, 2006.

Conny, J.M., **“Understanding Systematic Measurement Error in Thermal-Optical Analysis: Response surfaces and Surface Confidence Intervals,”** The 24th Annual American Association for Aerosol Research Conference, Austin, TX, October 18, 2005.

Conny, J.M., **“NIST-EPA Agreement on Measurements and Standards for Aerosol Carbon: Sampling Regional PM_{2.5} for the Chemometric Optimization of Thermal-Optical Analysis,”** The 24th Annual American Association for Aerosol Research Conference, Austin, TX, October 20, 2005.

Fahey, A.F., "***Precision Isotopic Measurement of Anthropogenic Uranium with the Cameca IMS 1270***," 19th Annual SIMS Workshop, Palm Springs, CA, May 17, 2006.

Fletcher, R.A., "***Removal Efficiencies of Particles from cloth and Planar Surfaces by Air Jet Impingement***," Annual Meeting of American Association for Aerosol Research, Austin, TX, October 18, 2005.

Fletcher, R.A., "***Test Particles for Calibration and Verification of Explosives Test Instrumentation***," Annual Meeting of American Association for Aerosol Research, Austin, TX, October 18, 2005.

Fletcher, R.A., "***Intercomparison of Three Techniques to Measure Aerosol Concentration for NIST Traceable Metrology***," Annual Meeting of American Association for Aerosol Research, Austin, TX, October 18, 2005.

Fletcher, R.A., "***NIST Traceable Method to Measure Aerosol Concentration***," Particle Workshop 2006, Gaithersburg, MD, April, 1 2006.

Fletcher, R.A., "***Generation and Characterization of Test Particles for Verification of Explosive Trace Detection Systems***," 2006 International Aerosol Conference, St. Paul, NM, September 14, 2006.

Fletcher, R.A., "***Verification of Aerosol for Gas Mask Fit Test Systems for First Responders***," DHS Review, Gaithersburg, MD, August 29, 2006.

Gillen, J.G., "***Surface Chemistry and Sampling for Trace Detection***," Trace Explosives Detection Conference, Miami, FL, June 15, 2006.

Gillen, J.G., "***3D Molecular Imaging Using Cluster SIMS***," 19th Annual SIMS Workshop, Palm Springs, CA, May 19, 2006.

Holbrook, R.D., "***Characterizing Natural Organic Matter using Fluorescence Spectroscopy and PARAFAC***," American Chemical Society Northeast Regional Meeting, Binghamton, NY, October 6, 2006.

Holbrook, R.D., "***Investigating the Characteristics and Behavior of Organic Material in Natural Systems using Fluorescence Spectroscopy***," 34th Northeast Regional American Chemical Society Meeting, Binghamton, NY, October 6, 2006.

Holbrook, R.D., "***Endocrine Disrupting Compounds: An Overview Targeting the Water and Wastewater Treatment Community***," CSAWWA/CWEA/WWOA Spring Meeting, College Park, MD, May 5, 2006.

Jach, T.J., "***Real-Time Observations of Long-Range Strains on 180° Ferroelectric Domain Walls with the Application of Electric Fields in Lithium Niobate Using X-ray Topography***," National Center for Neutron Research, NIST, October 11, 2005. Invited

Jach, T.J., "**High Resolution Microcalorimeter Detectors for X-ray Spectroscopy,**" American Physical Society, Baltimore, MD, March 15, 2006. Invited

Jach, T.J., "**Strains Observed in 180° Domain Walls in LiNbO₃ with Laue Topography,**" American Physical Society, Baltimore, MD, March 16, 2006.

Jach, T.J., "**The NIST Microcalorimeter X-ray Detector,**" Argonne National Laboratory, Argonne, IL, March 30, 2006. Invited

Jach, T.J., "**Quantitative Analysis on an Electron Probe with the NIST Transition Edge Sensor Microcalorimeter X-ray Detector,**" Microscopy and Microanalysis 2006 Meeting, Chicago, IL, July 31, 2006.

Jach, T.J., "**Quantitative Analysis on an Electron Probe with the NIST Transition Edge Sensor Microcalorimeter X-ray Detector,**" 55th Annual Denver X-ray Conference, Denver, CO, August 9, 2006.

Klouda, G.A., "**A Highly Flexible Minimum Dead time, Data Intensive Acquisition System for Characterizing Low-level Decay Events Constructed with Commercial Off-the-shelf Hardware,**" Conference on Methods and Applications of Radioanalytical Chemistry VII (MARC VII), Kona, HI, April 3, 2006.

Klouda, G.A., "**Seasonal Aerosol concentrations at Summit Greenland: Organic Carbon, Elemental Carbon and 14C Abundance of Total Carbon,**" Conference on Methods and Applications of Radioanalytical Chemistry VII (MARC VII), Kona, HI, April 3, 2006.

Kushmerick, J.G., "**New Tools for Molecular Electronics,**" Materials Research Society 2005 Fall Meeting, Hynes Convention Center, Boston, MA, November 29, 2005.

Kushmerick, J.G., "**New tools for Molecular Electronics,**" International Semiconductor Device Research Symposium, Bethesda, MD, December 7, 2005.

Kushmerick, J.G., "**Nanotechnology Applied for Development of Novel Electronic Devices and Systems,**" Washington Academy of Sciences, Washington, DC, January 17, 2006.

Kushmerick, J.G., "**New tools for Molecular Electronics,**" University of California, Santa Barbara, Materials Department; Santa Barbara, CA, May 26, 2006.

Li, J. and Anderson, I.M., "**Rocking-Beam Variable Coherence Electron Microscopy: An Alternative Approach to Fluctuation Electron Microscopy,**" Microscopy and Microanalysis Meeting, Chicago, IL, August 1, 2006.

Mahoney, C.M., "**Low Temperature Depth Profiling of Drug Eluting Stent Coatings with Cluster SIMS,**" 19th Annual SIMS workshop, Palm Springs, CA, May 19, 2006.

Mahoney, C.M., ***“3D characterization of biomaterials with cluster SIMS,”*** Microscopy and Microanalysis 2006 Meeting, Chicago, IL, August 3, 2006.

Mahoney, C.M., ***“Characterization of Polymeric Drug Delivery Systems with Cluster SIMS,”*** Gordon Research Conference, Big Sky, MT, August 20, 2006.

Marinenko, R.B., ***“Evaluation of Titanium Carbide Specimens for Microanalysis Reference Standards,”*** Microscopy and Microanalysis 2006 Conference, Chicago, IL, July 31, 2006.

Michaels, C.A., ***“High Spatial Resolution Infrared Imaging With a Solid Immersion Lens,”*** Eastern Analytical Symposium, Somerset, NJ, November 14, 2006.

Michaels, C.A., ***“Characterization of Thermoplastic Olefin Laminates by ATR-IR Spectroscopy,”*** Polymer Interface Consortium Meeting at Eastman Chemical, Kingsport, TN, May 23, 2006.

Michaels, C.A., ***“High Spatial Resolution IR Microscopy: Focal Plane Arrays and Solid Immersion Lenses,”*** Dow Chemical Company, Freeport, TX, June 26, 2006.

Michaels, C.A., ***“High Spatial Resolution Infrared Imaging with a Solid Immersion Lens and a Broadband Laser Source,”*** The Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Orlando, FL, September 27, 2006.

Newbury, D.E., ***“Electron-excited Energy Dispersive X-ray Spectrometry at High Speed and at High Resolution: Silicon Drift Detectors and Microcalorimeters,”*** Frontiers of Electron Microscopy in Materials Science, Kasteel Vaalbroek, Holland, September 27, 2005.

Newbury, D.E., ***“Electron-excited X-ray Spectrometry at High Speed and at High Resolution: Silicon Drift Detectors and Microcalorimeters,”*** The University of Oxford, Oxford, United Kingdom, October 3, 2005.

Newbury, D.E., ***“Silicon Drift Detectors (SDD): X-ray Spectrometry and Spectrum Imaging Above 100 kHz Output Count Rate, and What To Do With All This Data,”*** Midlands Microanalysis Group, University of Loughborough, Loughborough, United Kingdom October 5, 2005.

Newbury, D.E., ***“Overview of Quantitative Particle Analysis by SEM/EDS AFTAC,”*** AFTAC, Melbourne, Florida, October 13, 2005.

Newbury, D.E., ***“Not Just a Pretty Picture: X-ray Mapping is 50 Years Young, the Best is Yet to Come, and the Future is Now!”*** Appalachian Regional Microscopy Society, Boone, NC, October 20, 2005.

Newbury, D.E., ***“Blunders in Automatic Peak Identification of Major Constituents by Electron-excited Energy Dispersive X-ray Microanalysis,”*** Appalachian Regional Microscopy Society, Boone, NC, October 21, 2005.

Newbury, D.E., ***“Improved Performance in Electron-excited Energy Dispersive X-ray Spectrometry with the Silicon Drift Detector (SDD): Output Count Rates Above 100 kHz with Application to X-ray Imaging,”*** Conference on Atomic Level Characterization, Kona, Hawaii, December 8, 2005.

Newbury, D.E., ***“Blunders in Automatic Qualitative Energy Dispersive X-ray Microanalysis: An Emerging Crisis that Threatens Our Credibility as an Analytical Community,”*** Rocky Mountain Chapter of ASM and Denver Area Microbeam Analysis Society, Golden, CO, April 6, 2006.

Newbury, D.E., ***“Silicon Drift Detectors (SDD): X-ray Spectrometry and Spectrum Imaging above 100,000 cps and What To Do With All This Data,”*** Rocky Mountain Chapter of ASM and Denver Area Microbeam Analysis Society, Golden, CO, April 6, 2006.

Newbury, D.E., ***“The New X-ray Mapping: Applying the Silicon Drift Detector (SDD) for X-ray Spectrometry and Spectrum Imaging with Output Count Rates Above 100 kHz, and What To Do With All This Data!,”*** Metropolitan Microscopy Society, Mahwah, NJ, May 3, 2006.

Newbury, D.E., ***“Advances in X-ray Mapping for Characterization of Microstructures: Silicon Drift Detectors Microcalorimeters, X-ray Spectrum Imaging, and Data Mining,”*** American Geophysical Union Meeting, Baltimore, MD, April 25, 2006.

Newbury, D.E., ***“Automatic Peak Identification in Scanning Electron Microscopy/Energy Dispersive X-ray (SEM/EDS) Microanalysis: Can You Always Trust the Results?”*** American Geophysical Union Meeting, Baltimore, MD, May 25, 2006.

Newbury, D.E., ***“X-ray Mapping is 50 Years Young; the Best is yet to Come; and the Future is Now!”*** Microscopy and Microanalysis Conference, Chicago, IL, July 31, 2006.

Newbury, D.E., ***“Misidentification of X-ray Peaks by Automatic Peak Identification Procedures: Exploring the Situation for Minor and Trace Elemental Constituents,”*** Microscopy and Microanalysis Conference, Chicago, IL, July 31, 2006.

Newbury, D.E., ***“X-ray Mapping in the Spectrum Image Mode at Output Count Rates Above 100 kHz with the Silicon Drift Detector (SDD),”*** Microscopy and Microanalysis Conference, Chicago, IL, August 2, 2006.

Newbury, D.E., ***“Silicon Drift Detectors: Energy Dispersive X-ray Spectrometry and X-ray Spectrum Imaging at Output Count Rates Above 100 kHz, and What To Do With All This Data!,”*** Advanced Electron Probe Microanalysis Workshop, University of Oregon, September 13, 2006.

Newbury, D.E., ***“Challenges to Successful EDS X-ray Microanalysis in the Low Beam Energy Regime,”*** Advanced Electron Probe Microanalysis Workshop, University of Oregon, September 13, 2006.

Newbury, D.E., ***“The Perils of Automatic EDS Analysis: Blunders in Automated Peak Identification of Major, Minor and Trace Constituents and the Reality of Standardless Analysis,”*** Advanced Electron Probe Microanalysis Workshop, University of Oregon, September 14, 2006.

Nikoobakht, B., ***“Spectroscopic and Electrical Characterization of Buried Metal Interfaces: Metal-Molecule-Silicon Structure,”*** Materials Research Society 2005 Fall Meeting, Boston, MA, December 1, 2005.

Nikoobakht, B., ***“Fabricating Horizontally Grown Ultra Long Semiconductor Nanowires (Case of Zinc Oxide),”*** International Semiconductor Device Research Symposium, Bethesda, MD, December 9, 2005.

Nikoobakht, B., ***“Growth of Ultra-long Horizontally Grown ZnO NWs, their Photoluminescence and Electrical Properties,”*** American Physics Society, Baltimore Convention Center, Baltimore, MD, March 13, 2006.

Nikoobakht, B., ***“Non-linear Vibrational Spectroscopies for Characterizing Thin Films of Semi-conducting Polymers,”*** American Physics Society, Baltimore Convention Center, Baltimore, MD, March 14, 2006.

Powell, C.J., ***“NIST Databases for Applications in Auger Electron Spectroscopy and X-ray Photoelectron Spectroscopy,”*** 11th Topical Conference on Quantitative Surface Analysis, Peabody, MA, October 28, 2005.

Powell, C.J., ***“Calculations of Electron Inelastic Mean Free Paths from Optical Data for Quantitative Auger Electron Spectroscopy and X-ray Photoelectron Spectroscopy: Approaches, Uncertainties, and Comparisons with Experimental Data,”*** 11th Topical Conference on Quantitative Surface Analysis, Peabody, MA, October 29, 2005.

Powell, C.J., ***“Measurement of Thicknesses of HfO₂, HfSiO₄, ZrO₂, and ZrSiO₄ Films on Silicon by Angle-Resolved X-ray Photoelectron Spectroscopy,”*** AVS 52nd International Symposium, Boston, MA, November 1, 2005.

Powell, C.J., ***“Measurement of Thicknesses of High-Gate-Dielectric Films on Silicon by Angle-Resolved X-ray Photoelectron Spectroscopy,”*** American Physical Society Meeting, Baltimore, MD, March 14, 2006.

Powell, C.J., ***“Calculations of Electron Stopping Powers for Elemental Solids and Compounds,”*** Scanning 2006 Meeting, Washington, DC, April 27, 2006.

Powell, C.J., ***“New Applications of SESSA for Quantitative XPS,”*** Opportunities '06 Meeting, Albuquerque, NM, May 23, 2006.

Powell, C.J., "***Standardization for Surface Chemical Analysis,***" Workshop on Modeling and Data for Electron Spectroscopies: Standardization of Surface Analysis Techniques, Brussels, Belgium, September 13, 2006.

Powell, C.J., "***Use of the XPS Spectrum Simulation Tool SESSA for Improved Characterization of Thin Films,***" Workshop on Modeling and Data for Electron Spectroscopies: Standardization of Surface Analysis Techniques, Brussels, Belgium, September 14, 2006.

Powell, C.J., "***NIST Databases for Applications in Electron Spectroscopy,***" Workshop on Modeling and Data for Electron Spectroscopies: Standardization of Surface Analysis Techniques, Brussels, Belgium, September 14, 2006.

Powell, C.J., "***Calculations of Electron Stopping Powers for Elemental Solids and Compounds,***" Inelastic Mean Free Path Workshop, 11th Joint Vacuum Conference, Prague, September 28, 2006.

Ritchie, N.W., "***High Speed Particle Analysis with a Silicon Drift Detector,***" Microscopy and Microanalysis Meeting, Chicago, IL, July 31, 2006.

Robey, S.W., "***Electronic Structure and the Effects of Chemical Modification in Prototypical 'Molecular Wire' Systems,***" University of Delaware, Delaware, MD, October 12, 2005.

Robey, S.W., "***Change Addition Effects in Phenylene Ethynylene Oligomers: the Effect of –NO₂ Substitution,***" American Physics Society, Baltimore, MD, March 16, 2006.

Schultz, Z., "***Nonlinear Spectroscopic Characterization of Polymer thin Films,***" American Chemical Society National Meeting, Atlanta, GA, March 29, 2006.

Schultz, Z.D., "***The Government Postdoc,***" University of Illinois at Urbana-Champaign, Department of Chemistry Graduate Student Advisory Committee Career Symposia, Urbana, IL, July 29, 2006.

Scott, J.H., "***Measuring Pixel Classification Accuracy using Synthetic Spectrum Images,***" Microscopy and Microanalysis 2006 Conference, Chicago, IL, August 2, 2006.

Scott, J.H., "***Accuracy Issues in Chemical Dimensional Metrology in the TEM, SMAM-2,***" 2nd International Symposium Focused on Standard Materials and Metrology used in Nanotechnology, Chiyoda-ku, Tokyo, Japan, May 26, 2006.

Scott, J.H., "***High Resolution Chemical Analysis using Multidimensional Datasets,***" Australian Conference on Microscopy and Microanalysis, Sydney, Australia, February 6, 2006.

Simons, D.S., "***Ion detectors for SIMS,***" 19th Annual SIMS Workshop, Palm Springs, CA May 18, 2006.

Stranick, S.J., ***“Super Resolution Microscopies for Chemical and Material Analysis on Real World Samples,”*** The Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Quebec City, Canada, October 11, 2005.

Stranick, S.J., ***“Super Resolution Microscopies for Chemical and Material Analysis on Real World Samples,”*** PittCon 2006, Orlando, FL, March 15, 2006.

Teague, L.C., ***“Interfacial Molecular Charge Transport in Patterned Monolayer Films for OLED Applications,”*** Materials Research Society Spring Meeting, San Francisco, CA, April 21, 2006.

Teague, L.C., ***“Interfacial Molecular Charge Transport in Monolayer Films,”*** International Conference on Nanoscience and Technology, Basel, Switzerland, August 2, 2006.

Verkouteren, J.R., ***“Advances in Asbestos Toxicology and Exposure Assessment”*** Society of Toxicology, Review of Asbestos Measurement Methodology in Workshops, San Diego, CA, March 6, 2006.

Verkouteren, J.R., ***“Practical Considerations in Deployment of IMS Detection for Screening Purposes,”*** 15th International Conference on Ion Mobility Spectrometry, Honolulu, HI, July 25, 2006.

Verkouteren, R.M., ***“Inkjet metrology and standards for Ion Mobility Spectrometry,”*** 15th International Conference on Ion Mobility Spectrometry, Honolulu, HI, July 24, 2006.

Walker, M.L., ***“An In-Situ Ellipsometric Study of the Cl-Induced Adsorption of PEG on Ru and Cu UPD/Ru,”*** NOBCCHE Annual Conference, Los Angeles, CA, April 10, 2006.

Walker, M.L., ***“An In-Situ Ellipsometric Study of the Competitive Adsorption of PEG-/Cl-/(SPS/MPS)on Cu,”*** Meeting of the Electrochemical Society, Denver, Colorado, May 9, 2006.

Wight, S.A., ***“Evaluation of the Shapes of Auger and Secondary Electron Line Scans across Interfaces with the Logistic Function,”*** American Vacuum Society Conference, Peabody, MA, October 29, 2005.

Wight, S.A., ***“Chemical Imaging with Auger Electron Spectroscopy,”*** Microscopy and Microanalysis 2006 Conference, Navy Pier Convention Center, Chicago, IL, August 2, 2006.

Wight, S.A., ***“Report from NIST-MAS-AMAS Roadmap Workshop on Variable Pressure/Environmental Scanning Electron Microscopy,”*** Microscopy and Microanalysis 2006 Conference, Chicago, IL, August 3, 2006.

Yu, L., ***“Kondo Resonances and Anomalous Gate Dependence of Electronic Conduction in Single Molecule Transistors,”*** American Physical Society, Baltimore, MD, March 14, 2006.

Yu, L., “*Molecular Tunnel Junctions Incorporating Nickel-Octamedithiol MultilayerThin Film*,” NASA INAC Molecular Conductivity and Sensor Workshop, Charlottesville, VA, July 26, 2006.

3. Cooperative Research Development Agreements (CRADAs) and Consortia

None

4. Patents Issued

None

5. SRM Activities

SRM 1866b Common Commercial Asbestos
SRM 8850 Zeolite Y
SRM 8851 Linde Type A Zeolite
SRM 8852 Ammonium ZSM-5 Zeolite

6. SRD Activities

SRD 100 Simulation of Spectra for Surface Analysis,” (Version 1.1) Powell, C.J.

7. Calibrations

None

8. Committee Assignments

Anderson, I.M.

Microscopy Society of America, Focused Interest Group on Materials Research in an Aberration-Free Environment (Chair)

Member Proposal Review Committee, SHaRE User Facility, Oak Ridge National Laboratory

Cavanagh, R.R.

Fellow American Physical Society

Organizing Committee – NNI Interagency Workshop on Instrumentation and Metrology for Nanotechnology

Conny, J.M.

ASTM D-22 Sampling and Analysis of Atmospheres (Member)

Currie, L.A.

International Union of Pure and Applied Chemistry
Attribution Science Panel

Fahey, A.J.

NASA Planetary Instrument Definitions Proposal Review Panel
ASTM E-42 Surface Analysis (Member)
ASTM E-42.06 Secondary Ion Mass Spectrometry (Member)

Fletcher, R.A.

NFPA T2.9 Contamination Control Committee
U.S. TAG ISO/TC 131/SC6 on Contamination Control (Technical Advisor)
Washington Editorial Review Board (CSTL representative)

Gillen J.G.

ASTM E42 Surface Analysis
ASTM E42.06 Subcommittee on Secondary Ion Mass Spectrometry (Chairman)

Holbrook, R.D.

Member of Water Environment Research Foundation (WERF) Project Steering
Committees for Fate of Estrogenic Compounds During Municipal Sludge
Stabilization and Dewatering (2005-2008, WERF project 04-HHE-6)
Assistant Moderator, WEFTEC Research Symposium on Emerging Contaminants, 2005
and 2006

Jach, T.J.

Secretary, AVS, Mid-Atlantic Chapter
Co-Investigator, NASA Lunar Sortie Team, NASA Langley Laboratory
“Expert of International Standing” (annual large Scientific grant proposal reviews),
Australian Research Council

Marinenko, R.B.

Advisory Group for ISO TC202 on Microbeam Analysis (Member)
ASTM E42 Surface Analysis
ASTM E42.15 Electron Probe Microanalysis/Electron Microscopy (Member)
ASTM E42.96 US TAG for ISO TC202/SC2 on Microbeam Analysis (Member), US
TAG Chairman for TC202
Microbeam Analysis Society, Editor of MicroNews (Newsletter, pub. 3 times/yr)

Newbury, D.E.

ASTM E42 Surface Analysis (Member)
ISO TC202 on Microbeam Analysis (Member)
CSTL/837: Committee to Organize Workshop on Limits to Accuracy in Quantitative
Electron Probe Microanalysis

Powell, C.J.

ASTM Committee E-42 on Surface Analysis (Member)
ASTM Subcommittee E-42.02 on Terminology (Member)
ASTM Subcommittee E-42.03 on Auger-Electron Spectroscopy and X-Ray
Photoelectron Spectroscopy (Member)

International Advisory Board, European Conference on Application of Surface and Interface Analysis (Member)
Organizing Committee, 10th Topical Conference on Quantitative Surface Analysis (Chairman)
Report Committee on Elastic Scattering of Electrons and Positrons, International Commission on Radiation Units and Measurement (Member)
SEMATECH Analytical Laboratory Managers Council (Member)
Surface Chemical Analysis Technical Working Area, Versailles Project on Advanced Materials and Standards (U.S. Representative and Chairman)
Technical Committee 201 on Surface Chemical Analysis of the International Organization for Standards (U.S. Delegate)
Subcommittee 5 on Auger Electron Spectroscopy of ISO/TC 201 (Chairman)
U.S. Technical Advisory Group for ISO/TC 201 on Surface Chemical Analysis (Member)
International Advisory Committee, Second International Symposium on Practical Surface Analysis (Member)
Workshop on Electron Scattering in Solids: From Fundamental Concepts to Practical Applications of the International Union of Vacuum Science, Technique, and Applications (co-chairman)
NIST Workshop on Modeling Electron Transport for Applications in Electron and X-ray Analysis and Metrology (co-chairman)

Richter, L.J.

Division Laser Safety Officer
Division Representative to the CSTL Colloquium Committee

Scott, J.H.

ASTM E42-15 Electron Probe Microanalysis/Electron Microscopy (Member)
ASTM E42.96 US Tag for ISO/TC202/SC2 on Microbeam Analysis (Member)
ISO/Technical Committee 202/Subcommittee 3 (Secretary)

Simons, D.S.

ASTM E-42 Surface Analysis
ASTM E42.06 Secondary Ion Mass Spectrometry
ISO TC201 Surface Chemical Analysis – SC6 Secondary Ion Mass Spectrometry (Chairman of U.S. Delegation)
NIST Ionizing Radiation Safety Committee
Surface Science Spectra (Editorial Board)

Small, J.A.

Advisory Group for ISO TC202 on Microbeam Analysis (Member)
ASTM D22 Sampling and Analysis of Atmospheres (Member)
ASTM D22-05 Indoor Air (Member)
ASTM D22-05.01 Working Group Asbestos (Member)
ASTM E42-15 Electron Probe Microanalysis/Electron Microscopy (Chair)

Stranick, S.J.

NFO-7 Near-Field Optics and Related Techniques (Co-Chairman)
Committee: MRS Information Services Committee, Member 2003-2005
Committee: MRS Academic Affairs Committee, Member 2003-2005
Committee: ACS Awards Committee, Member 2002-2004
Committee: NFO Near-field Optics and Related Techniques Conference, International
Advisory Panel. 2001-2005.

Turner, S.

ASTM D22 Sampling and Analysis of Atmospheres (Member)
ASTM D22.07 Sampling and Analysis of Asbestos (Member)

Verkouteren, J.R.

International Center for Diffraction Data (ICDD), Secretary, Ceramics Subcommittee

Verkouteren R.M.

IAEA Stable Isotope Reference Materials Committee
Water and Environmental Samples
STP/CENR Air Quality Research Subcommittee

Wight, S.A.

ASTM Committee E-42 on Surface Analysis
ASTM E42.15 Electron Probe Microanalysis/Electron Microscopy (Member)
ASTM E42.96 U.S. TA/ISO/TC202 Microbeam Analysis (Member)

Windsor, E.S.

Division 837 Safety Representative

Zeissler, C.J.

NIST Ionizing Radiation Safety Committee Substitute Member
Safety Representative for Ionizing Radiation, Division 837

9. Editorships

Newbury, D.E.

Journal of Microscopy
Microscopy and Microanalysis
SCANNING

Simons, D. S.

Surface Science Spectra (Editorial Board)

Stranick, S.J.

Encyclopedia of Nanosciences and Nanotechnology," (Editorial Board)

10. Seminars

November 22, 2005

S. Tom Picraux, Los Alamos National Laboratory, "Synthesis and Novel Properties of Si/Ge Nanowires" (Sponsor: B. Nikoobakht)

December 9, 2005

Dr. Stephen J. Harris, Ford Research and Advanced Engineering, "Micro Raman Spectroscopy to Determine the Full State of Stress of Silicon. Application to Eutectic Si Particles in Cast Al" (Sponsor: R. Cavanagh)

January 19, 2006

Dan Dougherty, University of Pittsburgh, "STM/STS of Pyridine Chemisorbed on Cu (110)" (Sponsor: S. Robey)

February 23, 2006

Stephen Gross, Ohio State University, "Electronic Properties from CL and Chemical Properties from SIMS: Who tells what and can they be correlated?" (Sponsor: G. Gillen)

March 3, 2006

Nikolai Lebedev, Naval Research Laboratory, "Photo-Induced Electron Transfer at Bio-inorganic Interfaces" (Sponsor: J. Kushmerick)

March 13, 2006

Frank Ramos, "Secondary Ion Mass Spectrometry (SIMS) Analysis of Ferromagnetic Mn-implanted Si and InGaAsP/InP Laser Structures" (Sponsor: G. Gillen)

March 23, 2006

Jörg Zegenhagen, European Synchrotron Radiation Facility, "X-ray Studies of High-k dielectrics on Silicon and Surfaces and Interfaces of Oxides" (Sponsor: T. Jach)

April 10, 2006

Fred Stevie, North Carolina State University, "Focused Ion Beam: Principles and Applications", (Sponsor: B. Nikoobakht)

April 20, 2006

Hrvoje Petek, University of Pittsburgh, "How to capture and manipulate light with nanometer resolution and attosecond precision at a metal surface" (Sponsor: S. Robey)

May 22, 2006

Daniel Koscov, University of MD, "First Principles Study of Electron Transport through Molecules" (Sponsor: S. Robey)

May 22, 2006

Susie Eustis, Georgia Institute of Technology, "Formation Mechanism and Optical Properties of Some Gold Nanoparticles," (Sponsor: B. Nikoobakht)

May 23, 2006

Andrew Moad, Purdue University, "Polarization Effects in Nonlinear Optics: Theory and Experiment," (Sponsor: L. Richter)

June 1, 2006

Tim Brewer, Clemson University, "Glow Discharge: A Multidimensional Optical Emission and Mass Spectrometry Source from Solid Analysis to Metalloproteins" (Sponsor: Greg Gillen)

September 5, 2006

Masahito Oh-e, Japan Science & Technology Agency, and Hitachi Displays, Ltd., "Sum Frequency Vibrational Spectroscopy for Probing Chirality From A Helically Structured Polymer Thin Film" (Sponsor: L. Richter)

September 8, 2006

Dr. Prasad Rangaraju, Clemson University, "Investigation into Prematurely Deteriorated Concrete Exposed to Alkali-Acetate and Alkali-Formate Deicer Solutions" (Sponsor: Jeffrey Davis)

11. Conferences/Workshops/Sessions Sponsored/Co-Sponsored

October 1, 2005

Nano-Optics Symposium, APS Division of Laser Science Meeting Laser Science XXI, Tucson, AZ (Sponsor: C.A. Michaels)

May 11, 2006

Regional AVS Meeting, Newport News, VA (Sponsor: T. Jach)

May 18, 2006

Molecular-Scale Electronic Symposium, MRS Meeting, San Francisco, CA, May 18, 2006 (Sponsor: J.G. Kushmerick)

August 7-11, 2006

Quantitative XRF Session, 55th Annual Conference on Applications of X-ray Analysis, Denver, CO, (Sponsor: T. Jach, Co-Chair).