

DIPANKAR ROY: CURRICULUM VITAE

CONTACT INFORMATION

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EDUCATION

Ph.D., Physics, Rensselaer Polytechnic Institute, Troy, New York, USA
Thesis Advisor: Thomas Furtak
M.Sc., Physics, Calcutta University, India
B.Sc., Physics Honors, Calcutta University, India

PROFESSIONAL APPOINTMENTS

2006- present: Professor, Dept. of Physics, Clarkson University
(Courtesy Appointment in Chemistry since 2004)
1995-2006: Associate Professor, Dept. of Physics, Clarkson University
1989-1995: Assistant Professor, Dept. of Physics, Clarkson University
1986-1989: Postdoctoral Associate, with Late Prof. Andreas Albrecht,
Materials Science Center, Cornell University
1981-1986: Graduate Research and Teaching Assistant,
Rensselaer Polytechnic Institute
1979-1980: Research Associate, Saha Institute, Calcutta, India

ADMINISTRATIVE EXPERIENCE

Executive Officer, Physics Department, Clarkson University, 2000-present

HONORS AND AFFILIATION

Outstanding Advisor Award, Clarkson University, 1995 and 2006
Clarkson Board of Trustees' Recognition for Scholarly Excellence, 2002
Clarkson University Student Athletic Board's Faculty Appreciation Award, 2005
Member: American Chemical Society, American Physical Society, Electrochemical Society, Sigma Pi Sigma, Sigma Xi

RESEARCH

Research Areas

General:

Materials for energy storage and energy conversion devices; surface engineered materials; surface optics; electrochemical studies of surfaces and interfaces

Specific topics:

- Electrochemical studies of nanomaterials for batteries and fuel cells: *Experiment*
- Chemically assembled nanomaterials: *Experiment and some theory*
- Utilization of Electrochemical Impedance Spectroscopy (EIS) for time-resolved studies of interfacial reactions: *Experiment and theory*
- Electrochemical Mechanical Planarization (ECMP) and Chemical Mechanical Planarization (CMP) of electronic materials: *Experiment*
- Electrochemical Surface Plasmon Resonance as a tool for characterizing interfacial reaction kinetics: *Experiment and theory*
- Second harmonic generation (SHG) studies of solid-liquid interfaces: *Experiment and theory*
- Surface enhanced Raman scattering (SERS) studies of solid liquid interfaces: *Experiment and some theory*

Publications in Refereed Journals

81. P. C. Goonetilleke, J. P. Zheng, and D. Roy, Effects of Surface-Film Formation on the Electrochemical Characteristics of LiMn_2O_4 Cathodes of Lithium Ion Batteries, *J. Electrochem. Soc.*, **156**, Issue 9, (2009) A709-A719

80. J.P. Zheng, C.M. Pettit, P.C. Goonetilleke, G.M. Zenger and D. Roy, D.C. Voltammetry of ionic liquid based capacitors: effects of faradaic reactions, electrolyte resistance and voltage scan speed investigated using an electrode of carbon nanotubes in EMIM-EtSO₄, *Talanta*, **78** (2009)1056-1062.

79. J.P. Zheng, D. Roy, Electrochemical examination of surface films formed during chemical mechanical planarization of copper in acetic acid and dodecyl sulfate solutions. *Thin Solid Films* **517** (2009) 4587-4592.

78. C.M. Sulyma, P.C. Goonetilleke and D. Roy, "Analysis of current transients for voltage pulse-modulated surface processing: Application to anodic electro-dissolution of copper for electrochemical mechanical planarization", *Journal of Materials Processing*

Technology **209** (2009) 1189-1198.

77. S. Pandija, D. Roy and S.V. Babu, "Achievement of high planarization efficiency in CMP of copper at a reduced down pressure", *Microelectronic Engineering* **86** (2009) 367-373.

76. J. P. Zheng, B. K. Klug, and D. Roy, "Electrochemical Investigation of Surface Reactions for Chemical Mechanical Planarization of Tantalum in Oxalic Acid Solutions", *Journal of The Electrochemical Society*, **155** (2008) H341-H350.

75. P.C. Goonetilleke and D. Roy, "Relative roles of acetic acid, dodecyl sulfate and benzotriazole in chemical mechanical and electrochemical mechanical planarization of copper", *Applied Surface Science* **254** (2008) 2696-2707.

74. B. K. Klug, C. M. Pettit, S. Pandija, S. V. Babu and D. Roy, "Investigation of dissolution inhibitors for electrochemical mechanical planarization of copper using beta-alanine as a complexing agent", *Journal of Applied Electrochemistry* **38** (2008) 1347-1356.

73. C. V. V. S. Surisetty, P. C. Goonetilleke, D. Roy, and S. V. Babu, "Dissolution Inhibition in Cu-CMP Using Dodecyl-Benzene-Sulfonic Acid Surfactant with Oxalic Acid and Glycine as Complexing Agents", *Journal of The Electrochemical Society*, **155** (2008) H971-H980.

72. S. V. S. B. Janjam, S. Peddeti, D. Roy and S. V. Babu, "Tartaric Acid as a Complexing Agent for Selective Removal of Tantalum and Copper in CMP", *Electrochemical and Solid-State Letters* **11** (2008) H327-H330.

71. S. V. S. B. Janjam, C. V. V. S. Surisetty, S. Pandija, D. Roy, and S. V. Babu, "Oxalic-Acid-Based Slurries with Tunable Selectivity for Copper and Tantalum Removal in CMP", *Electrochemical and Solid-State Letters* **11** (2008) H66-H69.

70. C. M. Pettit⁺ and D. Roy*, "Surface plasmon resonance as a time-resolved probe of structural changes in molecular films: considerations for correlating resonance shifts with adsorbate layer parameters", *The Analyst* **132**, (2007) 524-535.

69. P.C. Goonetilleke⁺ and D. Roy*, "Voltage pulse-modulated electrochemical removal of copper surface layers using citric acid as a complexing agent" *Materials Letters* **61**, (2007) 380-383.

68. Y. Hong, V. K. Devarapalli, D. Roy, and S. V. Babu, "Synergistic Roles of Dodecyl Sulfate and Benzotriazole in Enhancing the Efficiency of CMP of Copper", *Journal of The Electrochemical Society* **154**, (2007) H 444-H 453

67. S. Pandija, D. Roy and S.V. Babu, "Chemical mechanical planarization of copper using abrasive-free solutions of oxalic acid and hydrogen peroxide", *Materials Chemistry and Physics*, **102**, (2007) 144-151.
66. S. Ramakrishnan, S.V.S.B. Janjam, U.B. Patri, D. Roy, and S.V. Babu, "Comparison of dicarboxylic acids as complexing agents for abrasive-free chemical mechanical planarization of copper", *Microelectronic Engineering* **84** (2007) 80-86.
65. C.M. Pettit⁺, P.C. Goonetilleke⁺, C.M. Sulyma⁺ and D. Roy, "Combining impedance spectroscopy with cyclic voltammetry: Measurement and analysis of kinetic parameters for faradaic and nonfaradaic reactions on thin-film gold", *Analytical Chemistry* **78** (2006) 3723-3729.
64. C.M. Pettit⁺, P. C. Goonetilleke and D. Roy, "Measurement of differential capacitance for faradaic systems under potentiodynamic conditions: Considerations of Fourier transform and phase-selective techniques" *Journal of Electroanalytical Chemistry* **589** (2006), 219-231.
63. K.A. Assiongbon, S.B. Emery, V.R.K. Gorantla, S.V. Babu and D. Roy, "Electrochemical Impedance Characteristics of Ta/Cu Contact Regions in Polishing Slurries used for Chemical Mechanical Planarization of Ta and Cu: Considerations of Galvanic Corrosion", *Corrosion Science* **48** (2006), 372-388.
ScienceDirect's Top 25 Hottest Articles
62. C.M. Pettit⁺ and D. Roy*, "Role of iodate ions in chemical mechanical and electrochemical mechanical planarization of Ta investigated using time-resolved impedance spectroscopy", *Materials Letters* **59** (2005), 3885-3889.
61. Y. Hong, U. B. Patri, S. Ramakrishnan, D. Roy and S.V. Babu, "Utility of dodecyl sulfate surfactants as dissolution inhibitors in chemical mechanical planarization of copper" *Journal of Materials Research* **20** (2005) 3413-3424.
60. K. A. Assiongbon and D. Roy, Electro-oxidation of methanol on gold in alkaline media: Adsorption characteristics of reaction intermediates studied using time resolved electro-chemical impedance and surface plasmon resonance techniques" *Surface Science*, **594** (2005), 99-119. *ScienceDirect's Top 25 Hottest Articles*
59. P. C. Goonetilleke and D. Roy, "Electrochemical-Mechanical Planarization of Copper: Effects of Chemical Additives on Voltage Controlled Removal of Surface Layers in Electrolytes", *Materials Chemistry and Physics* **94** (2005) 388-400.
58. S. B. Emery, J. L. Hubble and D. Roy, "Time Resolved Impedance Spectroscopy as a probe of Electrochemical Kinetics: The Ferro/Ferricyanide Redox Reaction in the Presence of Anion Adsorption on Thin Film Gold", *Electrochimica Acta*, **50** (2005) 5659-5672.

57. D.C. Bradford, E. Hutter, J.H. Fendler and D. Roy, "Surface-Enhanced Infrared Ellipsometry of Self-Assembled Undecanethiol and Dodecanethiol Monolayers on Disordered Gold Nanoisland Substrates", *Journal of Physical Chemistry B*. **109** (2005), 20914-20922.
56. P. C. Goonetilleke, S. V. Babu, and D. Roy, "Voltage-Induced Material Removal for Electrochemical Mechanical Planarization of Copper in Electrolytes Containing NO₃⁻, Glycine, and H₂O₂", *Electrochemical & Solid-State Letters* **8** (2005) G190-193.
55. Y. Hong, D. Roy and S. V. Babu, "Ammonium Dodecyl Sulfate as a Potential Corrosion Inhibitor Surfactant for Electrochemical Mechanical Planarization of Copper," *Electrochemical and Solid-State Letters* **8** (2005) G297-G300.
54. V. R. K. Gorantla, K. A. Assiongbon, S. V. Babu and D. Roy, "Citric Acid as a Complexing Agent in Chemical-Mechanical Planarization of Copper: Investigation of Surface Reactions using Impedance Spectroscopy", *J. Electrochem. Soc.* **152** (2005) G404-G410.
53. V.R.K. Gorantla, S. B. Emery[§], S. Pandija, S.V. Babu and D. Roy, "Chemical effects in Chemical Mechanical Planarization of TaN: Investigation of Surface Reactions in a Peroxide-Based Alkaline Slurry using Fourier Transform Impedance Spectroscopy", *Materials Letters* **59** (2005) 690-693.
52. S. B. Emery, J. L. Hubble, M. A. Darling, and D. Roy, "Chemical Factors for Chemical Mechanical and Electrochemical Mechanical Planarization of Silver Examined using Potentiodynamic and Impedance Measurements", *Materials Chemistry and Physics* **89** (2005) 345-353.
51. D.C. Bradford, E. Hutter, K.A. Assiongbon, J.H. Fendler and D. Roy, "Infrared Ellipsometry of Self-Assembled Octadecylmercaptan on Gold Films and Nanoislands: Effects of Thickness and Morphology of the Gold Layer", *Journal of Physical Chemistry B* **108** (2004) 17523-17530.
50. J. Lu, J. E. Garland, C. M. Pettit, S. V. Babu, and D. Roy, "Relative Roles of H₂O₂ and Glycine in CMP of Copper Studied with Impedance Spectroscopy", *Journal of The Electrochemical Society* **151** (2004) G717-G722.
49. K. A. Assiongbon, S. B. Emery, C. M. Pettit, S. V. Babu and D. Roy, "Chemical Roles of Peroxide-Based Alkaline Slurries in Chemical.Mechanical Polishing of Ta: Investigation of Surface Reactions Using Time-Resolved Impedance Spectroscopy", *Materials Chemistry and Physics* **86** (2004) 347-357.
48. C. M. Pettit⁺, J. E. Garland, M. J. Walters and D. Roy, "Time Resolved Study of Electrode Reactions using Fourier Transform Impedance Spectroscopy: Mutually Correlated Adsorption Kinetics of Cu²⁺ and ClO₄⁻ on gold", *Electrochimica Acta* **49** (2004) 3293-3304.

47. S.B. Emery, J.L. Hubbley and D. Roy, "Voltammetric and Amperometric Analyses of Electrochemical Nucleation: Electrodeposition of Copper on Nickel and Tantalum", *Journal of Electroanalytical Chemistry* **568C** (2004) 121-133.
46. J. E. Garland, C. M. Pettit and D. Roy, "Analysis of experimental constraints and variables for time resolved detection of Fourier transform electrochemical impedance spectra", *Electrochimica Acta* **49** (2004) 2623-2635.
45. D. Roy and J. H. Fendler, "Reflection and Absorption Techniques for Optical Characterization of Chemically Assembled Nanomaterials" (Review), *Advanced Materials* **16** (2004) 479-508.
44. C. M. Pettit, K. A. Assiongbon, J. E. Garland and D. Roy, "Time Resolved Detection of Electrochemical Effects by Surface Plasmon Resonance Measurements: A Simple Technique Using a Large Area Single Cell Photodiode", *Sensors and Actuators B* **96** (2003) 105-113.
43. L.A. Luck, M.J. Moravan, J.E. Garland, B. Salopek-Sondi and D. Roy, "Chemisorptions of Bacterial Receptors for Hydrophobic Amino Acids and Sugars on Gold for Biosensor Applications: A surface Plasmon Resonance Study of Genetically Engineered Proteins", *Biosensors and Bioelectronics* **19** (2003) 249-259.
42. E. Hutter, K.A. Assiongbon, J.H. Fendler and D. Roy, "Fourier Transform Infrared Spectroscopy Using Polarization Modulation and Polarization Selective Geometries: Investigation of Self-Assembled Octadecylmercaptan on a Thin Gold Film", *Journal of Physical Chemistry B* **107** (2003) 7812-7819.
41. J. E. Garland, K. A. Assiongbon, C. M. Pettit and D. Roy, "Surface Plasmon Resonance Transients at an Electrochemical Interface: Time Resolved Measurements Using a Bicell Photodiode", *Analytica Chimica Acta* **475** (2003) 47-58.
40. C. M. Pettit, J. E. Garland, N. R. Etukudo, K. A. Assiongbon, S. B. Emery[§] and D. Roy, "Electrodeposition of Indium on Molybdenum Studied with Optical Second Harmonic Generation and Electrochemical Impedance Spectroscopy", *Applied Surface Science* **202** (2002) 33-46.
39. M.J. Walters, K.A. Assiongbon, D.R. Marr, B.T. Shepardson and D. Roy, "Enhancement of Electrocatalytic Hydrogen Evolution on Tantalum by Sub-Monolayer Electrodeposition of Silver", *International Journal of Hydrogen Energy* **28** (2002) 275-285.
38. J.E. Garland, K. A. Assiongbon, C.M. Pettit, S.B. Emery and D. Roy, "Kinetic analysis of Electrosorption using Fast Fourier Transform Electrochemical Impedance spectroscopy: Underpotential Deposition of Bi³⁺ In The Presence of Coadsorbing ClO₄⁻ on Gold", *Electrochimica Acta* **47** (2002) 4113-4124.

37. C.M. Pettit, M.J. Walters and D. Roy, "Effects of Excess Charge at an Electrochemically Controlled Gold Surface Probed with Optical Second Harmonic Generation", *Laser Chemistry* **20** (2002) 57-79.
36. S. Chah, J. Yi, C. M. Pettit, D. Roy, and J. H. Fendler, "Ionization and Reprotonation of Self-Assembled Mercaptopropionic Acid Monolayers Investigated by Surface Plasmon Resonance Measurements", *Langmuir* **18** (2002) 314-318.
35. D. Roy, "Optical Characterization of Multi-Layer Thin Films Using the Surface Plasmon Resonance Method: A Six-Phase Model Based on the Kretschmann Formalism", *Optics Communications* **200** (2001) 119-130.
34. E. Hutter, J. H. Fendler, and D. Roy, "Surface Plasmon Resonance Studies of Gold and Silver Nanoparticles Linked to Gold and Silver Substrates by 2-Aminoethanethiol and 1,6-Hexanedithiol", *Journal of Physical Chemistry B* **105** (2001) 11159-11168.
33. S. Chah, E. Hutter, D. Roy, J. H. Fendler and J. Yi, "The Effect of Substrate Metal on 2-Aminoethanethiol and Nanoparticle Enhanced Surface Plasmon Resonance Imaging", *Chemical Physics* **272** (2001) 127-136.
32. D. Roy, "Surface Plasmon Resonance Spectroscopy of Dielectric Coated Gold and Silver Films on Supporting Metal Layers: Reflectivity Formulas in the Kretschmann Formalism", *Applied Spectroscopy* **55** (2001) 1046-1052.
31. E. Hutter, J. H. Fendler, and D. Roy, "Surface Plasmon Resonance Method for Probing Interactions in Nanostructures: CdS Nanoparticles Linked to Au and Ag Substrates by Self-Assembled Hexanedithiol and Aminoethanethiol Monolayers", *Journal of Applied Physics* **90** (2001) 1977-1985.
30. J.E. Garland, C.M. Pettit, M.J. Walters and D. Roy, "Analysis of Potentiostatic Current Transients at Metal-Liquid Interfaces: Resolving the Effects of a Finite Step Interval", *Surface and Interface Analysis* **31** (2001) 492-503.
29. M.J. Walters, J.E. Garland, C.M. Pettit, D.S. Zimmerman, D.R. Marr and D. Roy, "Weak Adsorption of Anions on Gold: Measurement of Partial Charge Transfer Using Fast Fourier Transform Electrochemical Impedance Spectroscopy", *Journal of Electroanalytical Chemistry* **499** (2001) 48-60. Addition and corrections: **526** (2002) 142.
28. M. J. Walters, C. M. Pettit and D. Roy, "Surface Kinetics of Electrodeposited Silver on Gold Probed with Potential Step and Optical Second Harmonic Generation Techniques", *Physical Chemistry Chemical Physics* **3** (2001) 570-578.
- (Ranked among top one percent of most frequently accessed articles in PCCP (2004)).
27. E. Hutter, S. Cha, J-F. Liu, J. Park, J. Yi, J. H. Fendler and D. Roy, "Role of Substrate

Metal in Gold Nanoparticle Enhanced Surface Plasmon Resonance Imaging", *Journal of Physical Chemistry B* **105** (2001) 8-12.

26. D. Roy, "Comment on Molecular Orientation by Second Harmonic Generation: Self Assembled Monolayers", *Physical Review B* **61** (2000) 13283-13286.

25. M.J. Walters, C.M Pettit, F.X. Bock, D.P. Biss^s and D. Roy, "Capacitance of a Metal-Liquid Interface During Anion Adsorption: Phase Selective Measurements in the Presence of D.C. Voltage Sweep and Finite Solution Resistance", *Surface and Interface Analysis* **27** (1999) 1027-1036.

24. M.A. Lovell, M.J. Walters and D. Roy, "Characterization of Electrodeposited Thin Film of Cadmium on Molybdenum using Optical Second Harmonic Generation", *Physical Chemistry Chemical Physics* **1** (1999) 1985-1993.

23. M. J. Walters and D. Roy, "Interference of Linear and Nonlinear Optical Effects in Second Harmonic Generation from Metal-Liquid Interfaces", *Applied Spectroscopy* **52** (1998) 1554-1568.

22. M. A. Lovell and D. Roy, "Effects of Sub-Surface Oxygen on Electrodeposition of Cadmium on Copper", *Electrochimica Acta* **43** (1998) 2117-2130. Addition and Corrections **44** (1999) 2327.

21. M. A. Lovell, M. J. Walters and D. Roy, "Surface Modification of Copper due to Co-Adsorbed Oxygen and Cadmium Probed with Optical Second Harmonic Generation", *Electrochimica Acta* **43** (1998) 2101-2110.

20. M. A. Lovell and D. Roy, "Optical Second Harmonic Generation from a Catalytically Active Molybdenum Electrode", *Applied Surface Science* **135** (1998) 46-52.

19. G. Nagy and D. Roy, "Optical Second Harmonic Generation as a Probe of Selective Dissolution of Brass", *Langmuir* **11** (1995) 3457-3466. Addition and Corrections, **12** (1996) 1696.

18. G. Nagy and D. Roy, "Surface Charge Dependence of Second Harmonic Generation from Brass", *Langmuir* **11** (1995) 711-715.

17. D. Roy, "DC Field Induced Optical Second Harmonic Generation from Metal-electrochemical Interfaces", *Electrochimica Acta* **39** (1994) 2699-2703. Addition and Corrections **40** (1995) 2557.

16. R. Gao and D. Roy, "Effects of Diffusion Limited Mass Transfer on Metal Underpotential Deposition Voltammograms", *Journal of Applied Electrochemistry* **24** (1994) 1276-1278.

15. G. Nagy and D. Roy, "Optical Characterization of a Partially Ag-Coated Ni Electrode

- with Second Harmonic Generation", *Journal of Physical Chemistry* **98** (1994) 6592-6600.
14. G. Nagy and D. Roy, "Second Harmonic Generation from a Charged Ni Electrode with and without Anion Adsorption", *Surface Science* **320** (1994) 7-16.
13. G. Nagy and D. Roy, "Surface Charge Dependence of Second Harmonic Generation from a Ni Electrode", *Chemical Physics Letters* **214** (1993) 197-202.
12. G. Nagy and D. Roy, "Oxidation of Cu in Halide Electrolytes Studied with Optical Second Harmonic Generation", *Langmuir* **9** (1993) 1868-1877.
11. R. Gao, T. D. Hewitt and D. Roy, "Stark Shift of an Interband Transition in Cu Determined by Surface Charge Measurements", *Journal of Physics and Chemistry of Solids* **54** (1993) 685-690.
10. T. D. Hewitt, R. Gao and D. Roy, "Effects of Surface Charge on the Second Harmonic Generation from a Cu Electrode", *Surface Science* **291** (1993) 233-241.
9. T. D. Hewitt and D. Roy, "Optical Second Harmonic Generation as a Probe of Hydrogen Evolution on Copper", *Chemical Physics Letters* **181** (1991) 407-412.
8. D. Roy and A. C. Albrecht, "Thin-Sheet Photoconductivity in Liquids: Mobility Measurements under the Influence of Space Charge", *Journal of Physical Chemistry* **93** (1989) 2475-2485.
7. D. Roy and T. E. Furtak, "Aspects of the Adsorption of Chloride on Silver Revealed through Surface Enhanced Raman Scattering", *Journal of Electroanalytical Chemistry* **228** (1987) 229-250.
6. D. Roy and T. E. Furtak, "The Origin of the Potential Dependence of the Surface Enhanced Raman Scattering of Chloride on Silver", *Chemical Physics Letters* **129** (1986) 501-504.
5. D. Roy and T. E. Furtak, "Vibrational Characteristics of Silver Clusters in Surface Enhanced Raman Scattering", *Physical Review B* **34** (1986) 5111-5117.
4. D. Roy and T. E. Furtak, "Evidence for Ag Cluster Vibrations in Enhanced Raman Scattering from the Ag/Electrolyte Interface", *Chemical Physics Letters* **124** (1986) 299-303.
3. T. E. Furtak and D. Roy, "The Short Range Mechanism of Surface Enhanced Raman Scattering", *Surface Science* **158** (1985) 126-146.
2. D. Roy and T. E. Furtak, "Characterization of Surface Complexes in Enhanced Raman Scattering", *Journal of Chemical Physics* **81** (1984) 4168-4175.

1.T. E. Furtak and D. Roy, "Nature of the Active Site in Surface Enhanced Raman Scattering", *Physical Review Letters* **50** (1983) 1301-1304.

Citations

Updated citation details are listed at:

<http://people.clarkson.edu/~samoy/citation.htm>

Recent Conference Papers, Posters and Presentations (2001-present)

92. D. Roy, "Characterization of Novel Materials for Lithium Ion Batteries", Talk presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 13-15, 2009.

91. J. E. Garland and D. Roy, "Measurement of the Electrical Parameters of a Monocrystalline Silicon Solar Cell by Combining Potentiodynamic and Impedance Techniques", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 13-15, 2009.

90. J. E. Garland, D. J. Crain and D. Roy, "Examination of Resistive Power Losses in a Single Crystal Silicon Solar Cell", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 13-15, 2009.

89. C. M. Sulyma, J. P. Zheng, D. C. Crain, J. E. Garland, C. Goia, I. Halaciuga, D. Goia and D. Roy, "Ball-Milled Lithium Manganese Oxide Nanoparticles as the Active Material for Cathodes in Rapid-Recharge Lithium Ion Batteries", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 13-15, 2009.

88. J. P. Zheng, P.C. Goonetilleke and D. Roy, "Electrochemical Characteristics of a Battery Cathode of Lithium Manganese Oxide in an Electrolyte of Lithium Tetrafluoroborate", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 13-15, 2009.

87. S. B. S. V. Janjam, Brown Peethala, D. Roy and S. V. Babu, "Single dispersion to polish both bulk Cu and residual Cu along with barrier layer", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 13-15, 2009.

86. P.C. Goonetilleke and D. Roy, "Advanced Lithium Ion Batteries", Poster presented at the *CAMP Technical Meeting*, Albany, NY, April 2-3, 2009.

85. C. Surisetty, S. Pandija, D. Roy and S.V. Babu, "Review of Slurry Chemistries for the Planarization of Copper", Paper presented at the Materials Research Society Spring Meeting, 2009, April 13-17, San Francisco, CA.

84. S. S. Moganty, P.C. Goonetilleke, R. E. Baltus, and D. Roy, "Electrochemical Characteristics of Ionic Liquid at Metal Surfaces" [Paper 510d], Paper presented at the AIChE Annual Meeting, November 16-21, 2008, Philadelphia, PA.
83. S. S. Mogantya, P. C. Goonetilleke, R. E. Baltus, and D. Roy, Diffusion coefficients of ferrocene and its derivatives in ionic liquids, Poster presented at the AIChE Annual Meeting, November 16-21, 2008, Philadelphia, PA.
82. S. S. Moganty, J. Close, P. C. Goonetilleke, S. Krishnan, R. E. Baltus and D. Roy, "Electrochemical Supercapacitors Based on Polymerizable Ionic Liquids", Poster presented at the AIChE Annual Meeting, November 16-21, 2008, Philadelphia, PA. Received first place among 161 posters presented to the Materials Engineering and Sciences Division (MESD) of AIChE [Award announcement published in: AIChE-MESD Newsletter, Volume 40, page 2, February 2009].
81. S. V. S. B. Janjam, D. Roy, and S. V. Babu, "Single Dispersion to Polish both Bulk Cu and Residual Cu along with Barrier Layers" Peer-Reviewed Conference Proceeding; *ECS Transactions, Proceedings of the International Semiconductor Technology Conference*, Shanghai, China (March 19-20, 2009).
80. S. B. S. V. Janjam, V. Kamavaram, D. Roy and S. V. Babu, "Single dispersion to polish both bulk Cu and residual Cu along with barrier layer" [Paper # B9], Paper presented at the *International Conference on Planarization Technology (ICPT)*, November 10-12, 2008, Hsinchu, Taiwan.
79. S.B.S.V. Janjam, C. Surisetty, S.V. Babu and D. Roy, "CMP of Ta and Cu", Talk presented at the SRC Fall Review Conference, October 30, 2008, Albany, NY.
78. D. Roy, "High Capacity, Rapid Recharge Lithium Ion Batteries", Talk presented at *CAMP Technical Meeting*, October 16, 2008, Potsdam, NY.
77. S. S. Moganty, P.C Goonetilleke, R. E. Baltus, and D. Roy, "Transport properties of ionic liquids", *American Chemical Society National Fall Meeting*, August 17-21, 2008, Philadelphia, PA.
76. J. P. Zheng, D. J. Crain, P. C. Goonetilleke, and D. Roy, "Electrochemistry of Ruthenium in a Moderately Acidic Nitrate Solution: Considerations for CMP and ECMP", Poster presented at the *13th International CMP Symposium*, Lake Placid, NY, August 10-13, 2008.
75. P. C. Goonetilleke, D. J. Crain, S. V. Babu and D. Roy, "Voltage Pulse Modulated Electrochemical Removal of Ruthenium Surface Layers for Applications in ECMP", Poster presented at the *13th International CMP Symposium*, Lake Placid, NY, August 10-13, 2008.

74. C. M. Sulyma, G. M. Zenger and D. Roy, "Electrochemical Investigation of Surface Reactions Relevant for CMP of Ta and Cu in Succinic Acid Solutions", Poster presented at the *13th International CMP Symposium*, Lake Placid, NY, August 10-13, 2008.
73. D. J. Crain, C. M. Sulyma, J. P. Zheng and D. Roy, "Dilution-Dependent Adsorption Characteristics of 1-Ethyl-3-Methylimidazolium Ethylsulfate ([EMIM][EtSO₄]) Ionic Liquid on a Thin-Film Gold Substrate: Investigation of Surface Kinetics Using Fourier Transform Electrochemical Impedance Spectroscopy (FT-EIS)", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 14-16, 2008.
72. P. C. Goonetilleke, S. Sengupta, T. Pyles, R. R. Revur, A. Tiruvannamalai and D. Roy, "Electrochemical Studies of Nanomaterials for Advanced Lithium-Ion Batteries," Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 14-16, 2008.
71. C. M. Sulyma and D. Roy, "Voltage-Controlled ECMP of Ta in Non-Alkaline Solutions," Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 14-16, 2008.
70. S. B. Janjam, S. Peddeti, V. Kamavarapu, D. Roy and, S. V. Babu, "Role of molecular structure of carboxylic acids as complexing agent in Chemical Mechanical Planarization (CMP) of Cu", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 14-16, 2008.
69. S. V. S. B. Janjam, S. Pandija, V. V. S. C. Surisetty, D. Roy, and S. V. Babu, "Development of a single dispersion for the planarization of Cu and barrier layer", in: Proceedings of the International Semiconductor Technology Conference (ISTC2008), March 15-17, 2008, Shanghai. ECS China (2008).
68. S. V. Babu and D. Roy, "CMP of Ta and Cu", Talk Presented at *Albany Nanotech. Institute*, Albany, New York, February 8, 2008.
67. S. S. Moganty, R. E. Baltus, P. C. Goonetilleke and D. Roy, "Physicochemical Characterization of Ionic Liquids", Conference paper presented at the *American Institute of Chemical Engineers (AIChE) Annual Meeting*, Salt Lake City, Utah, Nov. 4-9, 2007.
66. S. S. Moganty, P. C. Goonetilleke, R. E. Baltus and D. Roy, "Electrochemical Supercapacitors Based on Ionic Liquids", Poster presented at *CAMP Technical Meeting*, October 15-17, 2007, Potsdam, NY.
65. P. C. Goonetilleke, C. Sulyma, G. Zenger, S. Sengupta, T. Pyles, R. R. Revur, and D. Roy, "Electrochemical Characterization of Advanced Nanomaterials for Next Generation Lithium-Ion Batteries", Poster presented at *CAMP Technical Meeting*, October 15-17, 2007, Potsdam, NY.
64. P. C. Goonetilleke, S. S. Moganty, R. E. Baltus and D. Roy, "Electrochemical Characteristics of Ionic Liquids at the Porous Surface of a Paper Electrode of Multiwall

Carbon Nanotubes”, Poster presented at CAMP Technical Meeting, October 15-17, 2007, Potsdam, NY.

63. Z. P. Zheng, B. K. Klug and D. Roy, “Electrochemical Examination of Dissolution Inhibitor Films for Applications in ECMP of Copper”, Poster presented at CAMP Technical Meeting, October 15-17, 2007, Potsdam, NY.

62. D. Roy, “Time Resolved Electrochemical Impedance Spectroscopy”, Talk presented at General Motors Global Alternative Propulsion Center, Honeoye Falls, NY; May 16, 2007.

61. P. C. Goonetilleke and D. Roy, “Dodecyl Sulfate as a Corrosion Inhibitor and Acetic Acid as a Complexing Agent for Electrochemical Mechanical Planarization of Copper”, Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 16-18, 2007.

60. P. C. Goonetilleke, D. Roy, “Material Removal Efficiency of an Alkaline Electrolyte for ECMP of Ruthenium”, Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 16-18, 2007.

59. S. Pandija, D. Roy and S. V. Babu, “Effect of Anionic Surfactant and Benzotriazole for improving planarization efficiency during Cu CMP”. Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 16-18, 2007.

58. S.V. Babu, D. Roy, S. Ramakrishnan, S. B. Janjam and C. Surisetty, “Role of Molecular Structure of Carboxylic Acids as Complexing Agents in Chemical Mechanical Planarization of Cu. Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 16-18, 2007.

57. C. M. Sulyma, P. C. Goonetilleke and D. Roy, “Analysis of Current Transients for Voltage Modulated ECMP of Copper”, Poster presented at the CAMP Technical Meeting, Canandaigua, NY, May 16-18, 2007.

56. D. Roy, “Novel Electrochemical Applications of Ionic Liquids”, Talk presented at *CAMP Technical Meeting, Potsdam, NY, October 19, 2006*.

55. P.C. Goonetilleke and D. Roy, “Material Removal for ECMP of Ruthenium”, Poster presented at *CAMP Technical Meeting, Potsdam, NY, October 18-20, 2006*

54. C.M. Sulyma, P.C. Goonetilleke and D. Roy, “Analysis of Current Transients for Pulse-Modulated ECMP of Copper”, Poster presented at *CAMP Technical Meeting, Potsdam, NY, October 18-20, 2006*.

53. S. Pandija, Ji Hyan Li D. Roy, and S. V. Babu, "Effect of hydrogen peroxide concentration on planarization efficiency during Cu CMP". Poster presented at CAMP Technical Meeting, October 18-20, 2006.

52. C.M. Sulyma, P.C. Goonetilleke and D. Roy, "Analysis of Current Transients for Voltage Pulse-Modulated Electrochemical Mechanical Planarization (ECMP) of Copper", Poster presented at the *11th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 13-16, 2006.

51. B.K.Klug, C.M.Pettit, S. Pandija, M.L. Anderson, S.V. Babu and D.Roy, "Surface Reactions of Ammonium Dodecyl Sulphate (ADS) and Benzotriazole (BTAH) Dissolution Inhibitors in Chemical Mechanical and Electrochemical Mechanical Planarization of Copper" Poster presented at the *11th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 13-16, 2006.

50. P.C. Goonetilleke and D. Roy, "Material Removal Efficiency of an Alkaline Electrolyte for Electrochemical-Mechanical Planarization (ECMP) of Ruthenium", Poster presented at the *11th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 13-16, 2006.

49. P.C. Goonetilleke and D. Roy, "Examination of Dodecyl Sulphate as a Corrosion Inhibitor and Acetic Acid as a Complexing Agent for Electrochemical-Mechanical Planarization of Copper", Poster presented at the *11th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 14-17, 2005.

48. S. Pandija, Ji Hyan Li D. Roy, and S. V. Babu, "Effect of hydrogen peroxide concentration on planarization efficiency during Cu CMP". Poster presented at the *11th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 13-16, 2006.

47. S. Pandija, Y. Hong, V.K. Devarapalli, D. Roy and S. V. Babu, "Cu Dissolution Inhibition, Planarization Efficiency and Passivation Film Structure", Talk presented at the *11th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 13-16, 2006

46. C.M. Sulyma and D. Roy, " A Possible Route to ECMP of Ta in Non-Alkaline Solutions", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 17-19, 2006.

45. P.C. Goonetilleke and D. Roy, "Faradaic Efficiency of Glycine-Hydrogen Peroxide Solutions in ECMP of Cu", Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 17-19, 2006.

44. S. Ramakrishnan , S. B. Janjam, D. Roy and S.V. Babu, " Investigation of slurry system in the chemical Mechanical Planarization (CMP) of Copper" Poster presented at the *CAMP Technical Meeting*, Canandaigua, NY, May 17-19, 2006.

43. D. Roy, "Electrochemical and Opto-Electrochemical Techniques for Characterization of Surface-Engineered Materials", *Physics Department Colloquium*, April 14, 2006.

42. J. L. Hubble, M.A. Darling, S.B. Emery, D. Roy, "Chemical Factors for Chemical Mechanical Planarization of Silver Studied Using Potentiodynamic and Impedance Measurements". Poster presented at the *National McNair Scholars Conference*, SUNY at Buffalo, NY, July 14-16, 2005.
41. D. Roy, "Characterization and Applications of Nanomaterials Based on Self-Assembled Monolayers", Talk presented at *Future of Physics Seminar Series*, organized by Physics Club & SPS, Clarkson University, November 7, 2005.
40. D. Roy, "Electrochemical Impedance Sensor for Probing Time Resolved Kinetics of Corrosion, Catalysis and other Reactions", Talk presented at *CAMP Annual Fall Meeting*, Clarkson University, Potsdam, NY, October 6, 2005.
39. C.M. Sulyma and D. Roy, "Voltage Controlled Surface Corrosion: A Possible Route to Electrochemical Mechanical Planarization (ECMP) of Ta in Non-Alkaline Solution", Poster presented at *CAMP Annual Fall Meeting*, Clarkson University, Potsdam, NY, October 6, 2005.
38. Y. Hong, D. Roy and S.V. Babu, "Ammonium Dodecyl Sulfate as a Potential Corrosion Inhibitor Surfactant for Electrochemical Mechanical Planarization of Copper" Poster presented at *CAMP Annual Fall Meeting*, Clarkson University, Potsdam, NY, October 6, 2005.
37. Y. Hong, U. B. Patri, S. Ramakrishnan, D. Roy and S.V. Babu, "Utility of Dodecyl Sulfate Surfactant as Dissolution Inhibitors in Electrochemical Mechanical Planarization of Copper" Poster presented at *CAMP Annual Fall Meeting*, Clarkson University, Potsdam, NY, October 6, 2005.
36. D. Roy, "Surface Plasmon Resonance and Electrochemical Impedance Techniques for Probing Reaction Kinetics at Thin Film Interfaces" *Chemistry Department Colloquium*, Clarkson University, Potsdam, NY 13699, September 8, 2005.
35. C.M. Pettit and D. Roy, "An Electrolyte Slurry Using Potassium Iodate Instead of Hydrogen Peroxide for Electrochemical Mechanical Planarization (ECMP) of Ta", Poster presented at the *10th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 14-17, 2005.
34. C.M. Sulyma and D. Roy, "Electrochemical Mechanical Planarization (ECMP) of Ta in Non-Alkaline Solutions", Poster presented at the *10th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 14-17, 2005.
33. P.C. Goonetilleke and D. Roy, "Faradaic Efficiency of Glycine-Hydrogen Peroxide Solutions in Electrochemical-Mechanical Planarization (ECMP) of Cu", Poster presented at the *10th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 14-17, 2005.

32. Y. Hong, D. Roy, and S.V. Babu, "Ammonium Dodecyl Sulfate as a Potential Corrosion Inhibitor Surfactant for Electrochemical Mechanical Planarization of Copper" Poster presented at the *10th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 14-17, 2005.
31. Y. Hong, U. B. Patri, S. Ramakrishnan, D. Roy and S.V. Babu, "Utility of Dodecyl Sulfate Surfactant as Dissolution Inhibitors in Electrochemical Mechanical Planarization of Copper" Poster presented at the *10th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 14-17, 2005.
30. S. Pandija, D. Roy, and S. V. Babu, "Performance of Dodecyl Anionic Surfactants as Dissolution-Inhibitors in Oxalic acid based slurries for Copper CMP". Poster presented at the *10th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 14-17, 2005.
29. S.V. Babu, S. Pandija, Y. Hong, P. C. Goonetilleke, D. Roy, "Complexing Agents and Surfactants in CMP and ECMP of Copper", Talk presented at the *10th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 14-17, 2005.
28. S. Pandija, D. Roy, and S. V. Babu, "Role of Oxalic acid in Slurry for Copper CMP" Poster presented at the *ACS Colloid and Surface Science Symposium*, Clarkson University, Potsdam, NY, June 12-14, 2005.
27. S.B. Emery, K.A. Assiongbon, C.M. Pettit, J.L. Hubble, V.R.K. Gorantla, S.V. Babu, D. Roy, "Electrochemical Impedance as a Probe of Galvanic Corrosion in Chemical Mechanical Planarization", Poster presented at the *CAMP Annual Technical Meeting*, Canandaigua, NY, May 11-13, 2005.
26. S. Pandija, D. Roy, and S. V. Babu, "Role of Oxalic acid in Slurry for Copper CMP" Poster presented at the *CAMP Annual Technical Meeting*, Canandaigua, NY, May 11-13, 2005.
25. S. B. Emery, K.A. Assiongbon, C.M. Pettit, V.R.K. Gorantla, S. Pandija, S.V. Babu, D. Roy, "Chemical Roles of Hydrogen Peroxide in CMP of Ta and TaN". Poster presented at the *CAMP Annual Technical Meeting*, Canandaigua, NY, May 11-13, 2005.
24. P.C. Goonetilleke, D. Roy, " Electrochemical Mechanical Planarization of Cu for Semiconductor Device Fabrication", Poster presented at the *CAMP Annual Technical Meeting*, Canandaigua, NY, May 11-13, 2005.
23. S. B. Emery, K.A. Assiongbon, C.M. Pettit, V.R.K. Gorantla, S. Pandija S.V. Babu, D. Roy, "Chemical Roles of Hydrogen Peroxide in CMP of Ta and TaN". Poster presented at the *9th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 8-12, 2004.
22. S.B. Emery, K.A. Assiongbon, C.M. Pettit, J.L. Hubble, V.R.K. Gorantla, S.V.

Babu, D. Roy, "Electrochemical Impedance as a Probe of Galvanic Corrosion in Chemical Mechanical Planarization", Poster presented at the *9th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 8-12, 2004.

21. J. L. Hubble, M.A. Darling, S.B. Emery, D. Roy, "Chemical Factors for Chemical Mechanical Planarization of Silver Studied Using Potentiodynamic and Impedance Measurements". Poster presented at the *9th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 8-12, 2004.

20. S. B. Emery, K.A. Assiongbon, C.M. Pettit, V.R.K. Gorantla, S. Pandija, S.V. Babu, D. Roy, "Chemical Roles of Hydrogen Peroxide in CMP of Ta and TaN in Alkaline Slurries". Poster presented at the *CAMP Annual Fall Meeting*, Clarkson University, Potsdam, NY, October 21, 2004.

19. J. L. Hubble, M.A. Darling, S.B. Emery, D. Roy, "Chemical Mechanical Planarization of Silver Studied Using Potentiodynamic and Impedance Measurements" Poster presented at the *CAMP Annual Fall Meeting*, Clarkson University, Potsdam, NY, October 21, 2004.

18. D. Roy, "Nanomaterials for Surface Plasmon Based Chemical and Biological Sensors", Talk presented at *Future of Physics Seminar Series* organized by Physics Club & SPS, Clarkson University, October 28, 2004.

17. C.M. Pettit, K.A. Assiongbon, D. Roy, "A surface Plasmon Resonance (SPR) Sensor for Probing Reaction Kinetics at Nanostructured Thin Film Interfaces", Poster presented at the *CAMP Annual Technical Meeting*, Canandaigua, NY, May 12-14, 2004.

16. J. L. Hubble, M.A. Darling, S.B. Emery, D. Roy, "Chemical Factors for Chemical Mechanical Planarization of Silver Studied Using Potentiodynamic and Impedance Measurements". Poster presented at the *9th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 8-12, 2004.

15. S.B. Emery, K.A. Assiongbon, C.M. Pettit, J.L. Hubble, V.R.K. Gorantla, "Electrochemical Impedance as a Probe of Galvanic Corrosion in Chemical Mechanical Planarization", Poster presented at the *9th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 8-12, 2004.

14. S. B. Emery, K.A. Assiongbon, C.M. Pettit, V.R.K. Gorantla, S. Pandija S.V. Babu, D. Roy, "Chemical Roles of Hydrogen Peroxide in CMP of Ta and TaN". Poster presented at the *9th International Symposium on Chemical Mechanical Planarization*, Lake Placid, NY, August 8-12, 2004.

13. J. L. Hubble, M.A. Darling, S.B. Emery, D. Roy, "Chemical Mechanical Planarization of Silver Studied Using Potentiodynamic and Impedance Measurements"

Poster presented at the CAMP Annual Fall Meeting, Clarkson University, Potsdam, NY (October 21, 2004).

12. S. B. Emery, K.A. Assiongbon, C.M. Pettit, V.R.K. Gorantla, S. Pandija S.V. Babu, D. Roy, "Chemical Roles of Hydrogen Peroxide in CMP of Ta and TaN in Alkaline Slurries". Poster presented at the *CAMP Annual Fall Meeting*, Potsdam, NY (October 21, 2004).

11. J. Lu, J.E. Garland, C.M. Pettit, S.V. Babu, and D. Roy, Electrochemical Studies of Copper Chemical Mechanical Polishing Mechanism: Effects of Oxidizer Concentration, published in: *Materials Research Society Proceedings*, Editors: D. S. Boning, K. Devriendt, M. R. Oliver, D. J. Stein, I. Vos, p. F 6.4, Volume 767, *Materials Research Society*, Warrendale, 2003 (peer-reviewed conference proceeding). Talk presented at *MRS Spring Meeting*, San Francisco, CA (April 21-25, 2003).

10. E. Hutter, D. Roy, and J.H. Fendler, "Interactions between nanoparticles and between nanoparticles and substrates" Talk presented at the International Symposium "*Colloidal and Molecular Electro-Optics*" New Orleans, Louisiana (March 24-27, 2003).

9. D. Roy, Electrochemical Impedance Studies of Surface Reactions in CMP of Tantalum and Copper. Talk presented at the *VIIIth International Conference on Chemical Mechanical Polishing*, Lake Placid, New York (August 12, 2003).

8. S. B. Emery, J. L. Hubble, K. A. Assiongbon, C. M. Pettit, D. Roy, "Electrochemical Investigation of Tantalum Oxides in a Peroxide Medium at High pH", Poster presented at the *VIIIth International Conference on Chemical Mechanical Polishing*, Lake Placid, New York (August 10-13, 2003).

7. D. Roy, Catalytic and Galvanic Effects in Chemical Mechanical Polishing of Tantalum. Talk presented at the *CAMP Annual Fall Meeting*, Clarkson University, Potsdam, NY (October 16, 2003).

6. K. A. Assiongbon, S. B. Emery, J. L. Hubble, C. M. Pettit, D. Roy, "Galvanic Corrosion in Chemical Mechanical Polishing (CMP) of Ta/Cu Systems Studied with Electrochemical Impedance Spectroscopy (EIS)", Poster presented at the *CAMP Annual Fall Meeting*, Clarkson University, Potsdam, NY (October 16, 2003).

5. E. Hutter, D. Roy and J.H. Fendler, "Polarization Modulated Infrared Reflection Absorption (PM IRRAS) Spectroscopic and Surface Plasmon Resonance (SPR) Measurements of U-Mercaptoalkanoic Acid Self-Assembled Monolayer (SAM) Protonation Equilibria" (refereed contribution): Talk presented at the symposium S1, *Nanostructured Thin Films: New Routes to Advanced Materials and Applications*, as part of the 203rd Meeting of The Electrochemical Society in Paris, France, April 27-May 2, 2003.

4. E. Hutter, B. Lavine, D. Roy and J. H. Fendler, "Ultrasensitive optical detection of adsorbed nanoparticles, nanotechnology and its role in Homeland Security" Talk presented at the meeting of *Nanoscale Materials, Inc. & Hazardous Substance Research Center*, Kansas State University, KS, June 2-4, 2003.
3. E. Hutter, D. Roy and J.H. Fendler, "Self-assembly of upright 1,6-hexanedithiol monolayers as templates for nanoparticles", Talk presented at the *Electrochemical Society meeting*, Philadelphia, 2002.
2. D. Roy, "Biological and chemical sensors based on surface plasmon resonance in self-assembled nanostructured films", Talk presented at the *CAMP Fall Meeting*, Clarkson University, October 18, 2001.
1. S. Chah, E. Hutter, D. Roy, J. H.Fendler and J. Yi, "The Effect of Substrate Metal on 2-Aminoethanethiol and Nanoparticle Enhanced Surface Plasmon Resonance Imaging", Talk presented at the *6th World Congress of Chemical Engineering*, Melbourne, Australia, September 2001.

Other Publications

1. *Laboratory Manual for Physics I, PH 131*, D. Roy, John Wiley & Sons, New York (2000). ISBN 0-471-40741-0. Third Edition (2008): ISBN 978-0470-41038-7.
2. *Laboratory Manual for Physics II, PH 132*, D. Roy, John Wiley & Sons, New York (2000). ISBN 0-471-40742-9. Third Edition (2008): ISBN 978-0470-41038-7.
3. *Laboratory Manual for Physics for Life Sciences I, PH 141*, D. Roy, John Wiley & Sons, New York (2008). ISBN 978-0-470-41035-6.
4. *Laboratory Manual for Physics for Life Sciences II, PH 142*, D. Roy, John Wiley & Sons, New York (2008). ISBN 978-0-470-41036-3

Recent and Current Funding

Army Research Office (ARO)
Semiconductor Research Corporation
New York State Office of Science, Technology and Academic Research
NanoDynamics
Spectron Glass
National Science Foundation
John Wiley

Graduate Students Supervised in Research

Present graduate students:

Daniel Crain – Ph.D. Candidate
John Garland, Ph.D. Candidate (Currently serving the US Army)
Christopher Sulyma – Ph.D. Candidate
Jianping Zheng - Ph.D. Candidate

Former graduate students:

15. Pubudu Goonetilleke – Ph. D., 2008. *Thesis: Electrochemical Investigations of Advanced Materials for Microelectronic and Energy Storage Devices.* Post-graduation employment: Intel Corp.
14. Brian Klug- M.S., 2007. Post-graduation employment: Systems Engineer, Raytheon.
13. Jennifer Hubble - M.S., 2006. Post-graduation employment: Systems Engineer, Raytheon.
12. Christopher Pettit - Ph. D., 2006. *Thesis: Electrochemical impedance and surface Plasmon resonance studies of reactions at solid-liquid interfaces.* Post-graduation employment: Assistant Professor of Physics, Emporia State University, Kansas.
11. Katherine Masaryk – M.S., 2006. *Thesis: Langmuir and Frumkin Isotherms for analyzing electrosorption reactions in the framework of potentiodynamic impedance spectroscopy.*
10. Kankoe Assiongbon – Ph.D., 2005. *Thesis: Kinetics of electrochemically controlled surface reactions on bulk and thin film metals studied with Fourier transform impedance spectroscopy and surface plasmon resonance techniques.*
9. Jin Lu, Ph. D., 2004, Chemical Engineering (Co-advised with Dr. S.V. Babu) *Thesis: Relative roles of chemicals and abrasives in metal and dielectric chemical mechanical planarization.* Post-graduation employment: Micron Electronics.
8. Michael Walters - Ph.D., 2003. *Thesis: Investigation of adsorption reactions on Au and Ta using electrochemical techniques and optical second harmonic generation.* Post-graduation employment: Senior Optical Process Engineer, Corning Inc.
7. Maurice Lovell - Ph.D., 1999. *Thesis: Second Harmonic Generation Studies of Polycrystalline Copper and Molybdenum in Aqueous Media.* Post-graduation

employments: Postdoctoral Associate Kansas State University; Optical Scientist Richardson Grating Laboratory, Rochester, NY.

6. Kevin Kriescher- MS, 1998 Post-graduation employment: Lumen Intellectual Property Services, CA.

5. James Delaney - M.S., 1996 Post-graduation employments: Scientist, US SPRINT; Systems Engineer, Lucent Technologies.

4. Gabor Nagy - Ph.D., 1996. Thesis: *Optical Second Harmonic Generation Studies of Electrochemical Interfaces*. Postgraduation employments: Postdoctoral Fellow, Columbia University; Research Associate, Nano-Fabrication Laboratory, Cornell University; Scientist, Rockwell International.

3. Steven Hotaling - Ph.D., 1995. Thesis: *The Influence of Transition Metal Dopants on the Properties of Bismuth-Metal-Oxide Sillenites Grown by Czochralski and Hydrothermal Techniques*. Postgraduation employments: USAF Rome Labs, NY; DOD.

2. Renhe Gao - Ph.D., 1993. Thesis: *Thermodynamic and Electronic Aspects of Electrodeposition on Metals*. Post-graduation employments: Research Associate at University of Maryland, College Park; Engineer, Azino Corp.

1. Troy Hewitt - M.S., 1992. Thesis: *Electrochemical and Optical Studies of Metal-Liquid Interfaces*. Post-graduation employment: Research Fellow, Rensselaer Polytechnic Inst., NY.

Undergraduate Students Supervised in Research

Present undergraduate student (major field, year of graduating class):

22. Gregory Zenger (Electrical Engineering & Physics Double Major, 2009)

Former undergraduate students (major field, year of graduating class):

21. Zachary Lewis* (Physics, 2008)

20. Sarah Phillips* (Physics, 2007)

19. Scott Aefsky (Physics, 2006)

18. Maria Darling* (Physics, 2006)

17. Chritopher Sulyma- (Physics, 2005)

(currently continuing as a graduate student in our group)

16. Jennifer Hubble* (Physics, 2005)

* Students from the *McNair Scholars Program*

(currently continuing as a graduate student in our group)

15. Bryan Shepardson (Computer Engineering, 2004)
 14. Brian Baseel (Physics, 2003)
 13. Mark Decker (Physics, 2003)
 12. Ryan Kenner (Physics, 2003)
 11. Samuel Emery* (Physics, 2004)
 10. David Marr (Physics, 2003)
 9. Nse Etukudo* (Electrical Engineering, 2002)
 8. Amy Hall (Chemistry, 2001)
 7. Daniel Zimmerman (Physics, 2001)
 6. John Garland* (Physics, 2000)
- (continued as a graduate student in our group)*
5. Peter Arcadi* (Physics, 2000)
 4. David Biss (Physics, 1999)
 3. Francis Bock (Physics, 1998)
 2. Thomas Wu (NSF Young Scholar, 1992)
 1. Troy Hewitt (Physics, 1991)

TEACHING

Teaching Experience*

Courses taught at Clarkson University

- PH 111 (General Physics Lab I)
- PH 112 (General Physics Lab II)
- PH 121 (Freshman Physics Seminar)
- PH 131 (Physics I)
- PH 132 (Physics II)
- PH 207 (Experimental Physics)
- PH 232 (Modern Physics Laboratory)
- PH 251 (Observational Astronomy Laboratory)
- PH 327 (Experimental Physics I)
- PH 328 (Experimental Physics II)
- PH 401 (Physics Course Assistance)
- PH 437 (Experimental Physics III)
- PH 438 (Experimental Physics IV)
- PH 470, 471, 570 (Directed Study - Experimental.)
- PH 380 [Formerly PH 533] (Electromagnetic Theory I)
- PH 381 [Formerly PH 534] (Electromagnetic Theory II)

* A more detailed version of D. Roy's teaching records for 1989-2006 can be found at :
http://people.clarkson.edu/~samoy/DR_teaching.htm

ES 558 (Characterization of Materials; Team-taught with Eng. Faculty)
PH 523/323 (Optics)
PH 539 (Physics of Atoms & Molecules)
PH 580, 581 (Directed Study - Theory)
PH 681, PH 682 (Directed Study - Experiment)
PH 683, PH 684 (Graduate Seminar I, II)
PH 690 (Current Literature)
PH 679 (Quantum Theory of Solids)

Work in the area of Physics Education:

I was responsible for developing Computerized Freshman Physics Laboratories at Clarkson University during 1998-99 (NSF funded project). More details about this project can be found at: http://people.clarkson.edu/~samoy/dw_lab.htm

During 1998-99, I was responsible for developing new laboratories (introduced in fall 1999) for "Physics for Life Sciences" (PH 141, PH 142). I authored the Laboratory Manuals (unpublished) currently used for these courses. In addition, two Laboratory Manuals (both published) for our calculus based Introductory Physics courses were authored by me: *Laboratory Manuals for Physics I and II*, John Wiley & Sons, New York (2001).

I was responsible for developing new laboratories for Modern Physics (PH 232) and Experimental Physics (PH 327 and PH 328) during 1995-97. I authored the Laboratory Manuals (unpublished) currently used for these courses. In addition, I was closely involved with the initial stage (1997-99) of development of the *Freshman Physics Team Design Program* currently offered by our Physics Department.

SERVICE

Professional Service

Reviewer of proposals for

National Science Foundation,
Department of Energy
American Chemical Society
Ohio State Research Foundation

Reviewer of manuscripts for

Analytical Chemistry

Applied Spectroscopy
Analytical Biochemistry
Electrochimica Acta
Journal of Applied Physics A
Journal of Chemical Physics
Journal of Electrochemical Society
Journal of Physical Chemistry B
Journal of Physics and Chemistry of Solids
Int. Journal of Hydrogen Energy
Langmuir
Materials Letters
Materials Chemistry and Physics
Optics Communications
Electrochemical and Solid State Letters

Participation in Summer Programs for Underrepresented Groups and High School Students

- Served as Mentor for eight Undergraduate Research Scholars for the R. McNair Program during 1998-2005. These students (and their research work) are listed at: http://www.clarkson.edu/~samoy/dw_under.htm
- SCOPES and HORIZONS Coordinator for High-School Students
- Research Guide, NSF Young Scholar Program
- Research Mentor for HEOP Summer Research Scholar Program

Service: Departmental

- Freshman Recruiting Coordinator, Clarkson Physics Department, 1989-present
- Transfer Students' Coordinator, Physics Dept, 1989-present
- Graduate Committee Member, 1989-present
- Organizer and presenter of Physics Academic Presentation at Admission's *Open House* (twice in the fall and once in the spring, annually), 1990-present
- Organizer and presenter, Physics Freshman Orientation (annual event), 1990-present
- Physics-Representative at Family Weekend Events (every fall, 1993-present)
- Routinely interviewed with and conducted lab tours for prospective freshman students (1989-present)
- Undergraduate Laboratory Development Committee, 1992-present
- Presenter of Annual Physics Awards on University Recognition Day, 1993-2004
- Freshman Physics Laboratory Coordinator, 1993-present
- Physics Double Major Curriculum Coordinator, 1998-present
- Undergraduate Admission and Retention Committee (Chair, 1999)
- Physics & Chemistry Joint Curriculum Committee (Fall 1999)
- Class Scheduling Coordinator for Student Administrative Services, 1999-present
- Physics Faculty Search Committee, 2000

- Executive Officer, Physics, 2000-present
- Maintenance of Faculty-, Undergraduate- and Course-Pages of Physics Department Website, Clarkson University, 1999-2006
- Coordinator, ABET Review for Physics, October 2002
- Coordinator, Mid-term Middle States Accreditation Review for Physics, March 2003

Undergraduate Advising

All Clarkson Physics Majors during 1991-94 and 1996-97
All Clarkson Physics Majors, Classes of 1995-97 during 1995
All Clarkson Physics Majors, Classes of 2000-2003 during 1997-1999
Advising about 60% of all (50-60) physics majors since 2000

Service: School of Arts and Sciences

- Building Safety Committee (1993-2000)
- School of Science Curriculum Integration Committee (1994-1998)
- School of Science Reorganization Committee (Spring 1999)
- School of Arts and Sciences Academic Affairs Committee (2005-)

Service: University

- Senate Committee on Academic Standards (2003-2005)
- Sigma Pi Sigma and Physics Club Advising (1990-present)
- Faculty Senate (1994-96)
- Clarkson Chapter of “Teaching, Learning & Technology Roundtable”, 1998-99
- Campus-wide Freshman Year Committee, 1999
- President’s Committee to Review Graduation Requirement, 1999, 2002
- Communications Graduation Requirement Committee, 2000
- Faculty Mentoring Committee, 2001
- Honors Council Member (2002-2003)
- Clarkson University Honors Council Research Committee

Service on Graduate Thesis Committees (Excluding those of my own students):

I have served on external Thesis Committees of numerous PhD and MS Degree candidates at Clarkson University during 1989-2005. A detailed listing of these projects is presented at the following website:

http://people.clarkson.edu/~samoy/grad_com.htm

