

DIPANKAR ROY: CURRICULUM VITAE

CONTACT INFORMATION

Physics Department, Clarkson University, Potsdam, NY 13699-5820
E-mail: samoy@clarkson.edu
Web: <http://people.clarkson.edu/~droy/>
Phone: 315-268-6676/2396; Fax: 315-268-7754

EDUCATION

Ph.D., Physics, Rensselaer Polytechnic Institute, Troy, New York, USA (1986)
Thesis Advisor: Thomas Furtak
M.Sc., Physics and B.Sc., Physics, Calcutta University, India

PROFESSIONAL APPOINTMENTS

2010- present: Chair, Dept. of Physics, Clarkson University
2006- present: Professor, Dept. of Physics, Clarkson University
2000-2010 Executive Officer, Physics Department, Clarkson University
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

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 Physical Society.

RESEARCH

General research interests: Materials for energy storage and energy conversion devices; chemical mechanical planarization(CMP); surface engineered materials; surface optics; electrochemical studies of interfaces.

Specific topics of current research:

- Electrochemical studies of advanced materials for batteries and photovoltaic cells
- Chemically assembled nanomaterials
- Utilization of Electrochemical Impedance Spectroscopy (EIS) for time-resolved studies of interfacial reactions
- Electrochemical assessment of CMP and post-CMP consumables
- Electrochemical Surface Plasmon Resonance (SPR) as a tool for characterizing interfacial reaction kinetics
- Second harmonic generation (SHG) studies of solid-liquid interfaces
- Surface enhanced Raman scattering (SERS) studies of solid liquid interfaces

Publications in Refereed Journals

121. D. E. Simpson, K. E. Juda and D. Roy, "Electroanalytical Assessment of the Function of Nickel in Alkaline Electrocatalysis of Glycerol", *Electrocatalysis* **9** (2018) 86-101.
120. M. C. Turk, M. J. Walters and D. Roy, "Tribo-electrochemical investigation of a slurry composition to reduce dissolution and galvanic corrosion during chemical mechanical planarization of Cu-Ru interconnects", *Materials Chemistry and Physics* **201** (2017) 271-288.
119. M. C. Turk, M. J. Walters and D. Roy, "Experimental considerations for using electrochemical impedance spectroscopy to study chemical mechanical planarization systems", *Electrochimica Acta* **224** (2017) 355-368.
118. Y. Wang, M. C. Turk, M. Sankarasubramanian, A. Srivatsa, D. Roy, S. Krishnan, "Thermophysical and transport properties of blends of an ether-derivatized imidazolium ionic liquid and a Li⁺ based solvate ionic liquid", *Journal of Materials Science* **52** (2017) 3719-3740.
117. S. E. Rock, D. E. Simpson, M. C. Turk, J. T. Rijssenbeek, G. D. Zappi and D. Roy, "Nucleation Controlled Mechanism of Cathode Discharge in a Ni/NiCl₂ Molten Salt Half-Cell Battery", *Journal of The Electrochemical Society* **163** (2016) A2282-A2292.
116. M. C. Turk, X. Shi, D. A. J. Gonyer and D. Roy, "Chemical and Mechanical Aspects of a Co-Cu Planarization Scheme Based on an Alkaline Slurry Formulation", *ECS Journal of Solid State Science and Technology* **5** (2016) P88-P99.
115. A. Sreeram, S. Krishnan, S. J. DeLuca, A. Abidnejad, M. C. Turk, D. Roy, E. Honarvarfard and P. G. J. Goulet, "Simultaneous Electronic and Ionic Conduction in Ionic Liquid Imbibed Polyacetylene-Like Conjugated Polymer Films", *RSC Advances* **5** (2015) 88425-88435.

114. X. Shi, D. E. Simpson and D. Roy, "Tribo-Electrochemical Characterization of Ru, Ta and Cu CMP Systems Using Percarbonate Based Solutions", *ECS Journal of Solid State Science and Technology* **4** (2015) P5058-P5067 [Focus Issue on Chemical Mechanical Planarization: Advanced Material and Consumable Challenges].
113. X. Shi, D. E. Simpson and D. Roy, "The role of chemisorbed hydroxyl species in alkaline electrocatalysis of glycerol on gold", *Physical Chemistry Chemical Physics* **17** (2015) 11432-11444.
112. J.E. Garland, D.J. Crain and D. Roy, "Utilization of electrochemical impedance spectroscopy for experimental characterization of the diode features of charge recombination in a dye sensitized solar cell", *Electrochimica Acta* **148** (2014) 62-72.
111. L. Wu, R. I. Venkatanarayanan, X. Shi, D. Roy and S. Krishnan, "Glass Transition, Viscosity, and Conductivity Correlations in Solutions of Lithium Salts in PEGylated Imidazolium Ionic Liquids", *Journal of Molecular Liquids* **198** (2014) 398-408.
110. X. Shi, D. E. Simpson, M. J. Walters, C. M. Pettit and D. Roy, "Electrocatalysis of Hypophosphite on Nickel Investigated Using Time Resolved Fourier Transform Electrochemical Impedance Spectroscopy", *Journal of The Electrochemical Society* **161** (2014) H583-H592.
109. S.E. Rock, X. Shi, J.E. Garland, D. Roy, "Experimental considerations for temperature controlled measurements of fast charge recombination times in dye sensitized solar cells using open circuit voltage decay and impedance spectroscopy", *Measurement* **53** (2014) 71-82.
108. M. C. Turk, D. E. Simpson and D. Roy, "Examination of Salicylaldehyde as a Surface Modifier of Manganese for Application in Chemical Mechanical Planarization," *ECS Journal of Solid State Science and Technology* **2** (2013) P498-P505.
107. D.J. Crain, S.E. Rock, J.E. Garland and D. Roy, "Comparison of D.C. and A.C. Electro-analytical Methods for Measuring Diode Ideality Factors and Series Resistances of Silicon Solar Cells", *Current Applied Physics* **13** (2013) 2087-2097.
106. D.J. Crain, J.P. Zheng and D. Roy, "Electrochemical examination of core-shell mediated Li^+ transport in $\text{Li}_4\text{Ti}_5\text{O}_{12}$ anodes of lithium ion batteries", *Solid State Ionics* **240** (2013) 10-18.
105. S. Rock, W. Lin, D. Crain, S. Krishnan, and D. Roy, "Interfacial Characteristics of a PEGylated Imidazolium Bistriflamide Ionic Liquid Electrolyte at a Lithium Ion Battery Cathode of LiMn_2O_4 ," *ACS Applied Materials & Interfaces*, **5** (2013) 2075-2084.
104. Turk, M. C., Rock, S. E., Amanapu, H. P., Teugels, L. G., Roy, D., "Investigation of Per carbonate Based Slurry Chemistry for Controlling Galvanic Corrosion during CMP

of Ruthenium”, *ECS Journal of Solid State Science and Technology*, **2** (2013) P205-P213.

103. Shi, X., Rock, S. E., Turk, M. C., Roy, D., “Minimizing the effects of galvanic corrosion during chemical mechanical planarization of aluminum in moderately acidic slurry solutions”, *Materials Chemistry and Physics*, **136** (2012) 1027-1037.

102. Lebga-Nebane, J. L., Rock, S. E., Franclemont, J., Roy, D., Krishnan, S., “Thermophysical Properties and Proton Transport Mechanisms of Trialkylammonium and 1-Alkyl-1H-imidazol-3-ium Protic Ionic Liquids”, *Ind. Eng. Chem. Res.*, **51** (2012) 14084-14098.

101. D. J. Crain, J. P. Zheng, C. M. Sulyma, C. Goia, D. Goia and D. Roy, “Electrochemical features of ball-milled lithium manganate spinel for rapid-charge cathodes of lithium ion batteries”, *Journal of Solid State Electrochemistry*, **16** (2012) 2605-2615.

100. C.M. Sulyma, C. M. Pettit, J. E. Garland and D. Roy, "Surface plasmon resonance as a probe of interactions between a thin-film gold electrode and an aqueous supporting electrolyte containing 1-Ethyl-3-methylimidazolium ethyl sulfate ionic liquid", *Surface and Interface Analysis*, **44** (2012) 801-810.

99. S.E. Rock, D.J. Crain, C.M Pettit and D. Roy, “Surface-complex films of guanidine on tantalum nitride electrochemically characterized for applications in chemical mechanical planarization”, *Thin Solid Film*, **520** (2012) 2892-2900.

98. D. J. Crain, J. E. Garland, S. E. Rock and D. Roy, “Quantitative characterization of silicon solar cells in the electro-analytical approach: Combined measurements of temperature and voltage dependent electrical parameters,” *Analytical Methods*, **4** (2012) 106 – 117. *Included in the journal's themed issue on "Future Electroanalytical Developments."*

97. L. V. N. R. Ganapatibhotla, L.Wu, J. P. Zheng, X. Jia, D. Roy, J. B. McLaughlin and S. Krishnan, “Ionic liquids with fluorinated block-oligomer tails: Influence of self-assembly on transport properties”, *Journal of Materials Chemistry*, **21** (2011) 19275-19285.

96. J.E. Garland, D.J. Crain, D. Roy, “Impedance spectroscopy coupled with voltammetry for quantitative evaluation of temperature and voltage dependent parameters of a silicon solar cell”, *Solar Energy*, **85** (2011) 2912–2923.

95. J.P. Zheng, D.J. Crain, and D. Roy, “Kinetic aspects of Li intercalation in mechano-chemically processed cathode materials for lithium ion batteries: Electrochemical characterization of ball-milled LiMn_2O_4 ”, *Solid State Ionics* **196** (2011), 48-58.

94. S.E. Rock, D.J. Crain, J.P. Zheng, C.M. Pettit, D. Roy, "Electrochemical investigation of the surface-modifying roles of guanidine carbonate in chemical mechanical planarization of tantalum", *Materials Chemistry and Physics* **129** (2011) 1159– 1170
93. J.E. Garland, D.J. Crain, J.P. Zheng, C.M. Sulyma and D. Roy, "Electro-analytical Characterization of Photovoltaic Cells by Combining Voltammetry and Impedance Spectroscopy: Voltage Dependent Parameters of a Silicon Solar Cell under Controlled Illumination and Temperature", *Energy and Environmental Science*, **4** (2011) 485-498.
92. J. P. Zheng, S. S. Moganty, P. C. Goonetilleke, R. E. Baltus, and D. Roy, "A Comparative Study of the Electrochemical Characteristics of [Emim+][BF4-] and [Bmim+][BF4-] Ionic Liquids at the Surfaces of Carbon Nanotube and Glassy Carbon Electrodes", *J. Phys. Chem. C*, **115** (2011) 7527–75372
91. C. M. Sulyma, C. M. Pettit, C. V. V. S. Surisetty, S. V. Babu and D. Roy, "Electrochemical investigation of the roles of oxyanions in chemical–mechanical planarization of tantalum and tantalum nitride", *J Appl Electrochem*, **41** (2011) 561–576.
90. B. C. Peethala, D. Roy, and S. V. Babu, Controlling the Galvanic Corrosion of Copper during Chemical Mechanical Planarization of Ruthenium Barrier Films *Electrochem. Solid-State Lett.*, **14** (2011) H306-H310.
89. L. V. N. R. Ganapatibhotla, J.P. Zheng, D. Roy and S. Krishnan, "PEGylated Imidazolium Ionic Liquid Electrolytes: Thermophysical and Electrochemical Properties", *Chemistry of Materials*, **22** (2010) 6347–6360.
88. C. M. Sulyma and D. Roy, "Voltammetric current oscillations due to general and pitting corrosion of tantalum: Implications for electrochemical mechanical planarization", *Corrosion Science* **52** (2010) 3086-3098.
87. S.V.S.B. Janjam, B.C. Peethala, J. P. Zheng, S.V. Babu and D. Roy, "Electrochemical investigation of surface reactions for chemically promoted chemical mechanical polishing of TaN in tartaric acid solutions", *Materials Chemistry and Physics* **123** (2010) 521-528.
86. J.P. Zheng, P.C. Goonetilleke, C.M. Pettit and D. Roy, "Probing the electrochemical double layer of an ionic liquid using voltammetry and impedance spectroscopy: A comparative study of carbon nanotube and glassy carbon electrodes in [EMIM]⁺[EtSO₄]⁻", *Talanta*, **81** (2010) 1045-1055.
85. C. V. V. S. Surisetty, B. C. Peethala, D. Roy, and S. V. Babu, "Utility of oxy-anions for selective low pressure polishing of Cu and Ta in chemical mechanical planarization", *Electrochemical and Solid-State Letters*, **13** (2010) H244-H247.

84. C. M. Sulyma and D. Roy, "Electrochemical characterization of surface complexes formed on Cu and Ta in succinic acid based solutions used for chemical mechanical planarization", *Applied Surface Science*, **256** (2010) 2583-2595.
83. S. V. S. B. Janjam, B. C. Peethala, D. Roy and S. V. Babu, Chemical mechanical planarization of TaN wafers using oxalic and tartaric acid based slurries, *Electrochemical and Solid-State Letters*, **13** (2010) H1-H4.
82. S. S. Moganty, R. E. Baltus and D. Roy, "Electrochemical windows and impedance characteristics of [Bmim⁺][BF₄⁻] and [Bdmim⁺][BF₄⁻] ionic liquids at the surfaces of Au, Pt, Ta and glassy carbon electrodes", *Chemical Physics Letters*, **483** (2009) 90-94.
81. P. C. Goonetilleke, J. P. Zheng, and D. Roy, "Effects of Surface-Film Formation on the Electrochemical Characteristics of LiMn₂O₄ 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, 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 Nanoscale 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. Assiongon, 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. Assiongon, 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. Hubble 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. Assiongon, 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^s 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 Bi^{3+} In The Presence of Coadsorbing ClO_4^- 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[§] 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 on [Google Scholar](#)

h-index (January 2018): 33

i-10 index (January 2018): 96

Conference Papers, Posters and Presentations (2001-present)

163. C. A. Johnson, S. Wei and D. Roy, "Tribo-Electrochemical Examination of Glycine as a Complexing Agent for Potential Application in Abrasive-Free CMP of Cobalt", Poster presented at the 21st International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY (August 2017).

162. C. A. Johnson, S. Wei and D. Roy, "Experimental Considerations for using Tribo-Electrochemical Measurements to Study Metal CMP Systems", Poster presented at the

21st International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY (August 2017).

161. C. A. Johnson, S. Wei and D. Roy, “Measuring and Controlling the Rates of Tribo-Corrosion at a Pad-Metal Interface in CMP”, Poster presented at the 21st International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY (August 2017).

160. D. Roy, “Tribo-Electrochemical Characterization of Metal CMP Systems”, Talk presented at the 20th International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY (August 2016).

159. C. A. Johnson, S. Wei, M. C. Turk and D. Roy, “Electrochemical Evaluation of an Alkaline Solution for Post-CMP Cleaning using Thin Film and Bulk Disc Samples of Copper”, Poster presented at the 20th International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY (August 2016).

158. D. E. Simpson, X. Shi, and D. Roy, “A Percarbonate Based Alkaline Slurry Formulation for the CMP of Ru, Ta and Cu Assessed by Tribologically Controlled Electrochemical Measurements”, Poster presented at the 20th International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY (August 2016).

157. D. Roy, “Electroanalytical Characterization of Electrode Materials for Direct Alcohol Fuel Cells”, Talk presented at the Center for Advanced Materials Processing (CAMP) Annual Technical Meeting, May 19, 2016, Canandaigua, NY.

156. D. E. Simpson, X. Shi and D. Roy, “Electrochemical Probes of Anode Performance for Direct Alcohol Fuel Cells”, Poster presented at the CAMP Annual Technical Meeting, May 19, 2016, Canandaigua, NY.

155. M. C. Turk, D. A. Gonyer and D. Roy, “Tribo-electrochemical Characterization of a Percarbonate Based Slurry for Chemical Mechanical Planarization of Cobalt and Copper”, Poster presented at CAMP Annual Technical Meeting, May 19, 2016, Canandaigua, NY; and at the 20th International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY (August 2016).

154. C. A. Johnson, S. Wei and D. Roy, “Effects of Silica Abrasives on the Tribo-Corrosion Mechanism of Cobalt Planarization Using an Alkaline Slurry Formulation”, Poster presented at the CAMP Annual Technical Meeting, May 19, 2016, Canandaigua, NY; ; and at the 20th International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY (August 2016).

153. A. Sreeram, S. Krishnan, S. J. DeLuca, M. C. Turk, D. Roy, E. Honarvarfard and P. Goulet, “Simultaneous Electronic and Ionic Conduction in Ionic Liquid Imbibed Conjugated Polymer Films” - Talk presented at the American Chemical Society Fall Meeting, Boston, MA (August 2015).

152. M. C. Turk and D. Roy, "Impedance Spectroscopy as a Tool for Measuring Temperature Dependent Ionic Conductivities of Lithium Ion Battery Electrolytes" [Received 3rd prize in the overall best poster category], Poster presented at CAMP Annual Technical Meeting, Canandaigua, NY (May 2015).
151. X. Shi, D.E. Simpson and D. Roy, "Investigation of Alkaline Electrocatalysis at a Gold Anode for Application in Direct Glycerol Fuel Cells", Poster presented at CAMP Annual Technical Meeting, Canandaigua, NY (May 2015).
150. S. Krishnan, Y. Wang, M.C. Turk, M. Sankarasubramanian and D. Roy, "Thermomechanical and Electrical Properties of Ionic Liquid Imbibed PEG Gels", Poster presented at CAMP Annual Technical Meeting, Canandaigua, NY (May 2015).
149. S. Krishnan, Y. Wang, M. Sankarasubramanian, X. Shi, M.C. Turk and D. Roy, "Thermomechanical and Electrical Properties of Ionic Liquid Imbibed Poly(ethylene glycol) Gels Designed for Use in Lithium Batteries", Presented at the 2014 AIChE Annual Meeting, Atlanta, GA (November 2014).
148. D. Roy, "Electrochemical and Microstructural Characteristics of Nickel Cathodes in Half-Cells of Sodium Metal Halide Batteries", Talk presented at the [CAMP](#) Annual Technical Meeting, May 14-16, 2014.
147. X. Shi, D. E. Simpson, C.M. Pettit, M.J. Walters and D. Roy, "Electrocatalysis of Hypophosphite on Ni for Applications in the Fabrication of Surface Engineered Films and Alloys", Poster presented at the [CAMP](#) Annual Technical Meeting, May 14-16, 2014.
146. D. Gonyer, S. E. Rock, G. D. Zappi, J.T. Rijssenbeek and D. Roy, "Electrochemical and Microstructural Features of a Nickel Cathode Examined in a Half-Cell Configuration of Sodium Metal Halide Batteries", Poster presented at the [CAMP](#) Annual Technical Meeting, May 14-16, 2014.
145. S.E. Rock, X. Shi, J. E. Garland and D. Roy, "Investigation of Temperature Dependent Charge Recombination in a Dye Sensitized Solar Cell Using Open Circuit Voltage Decay Measurements, Poster presented at the [CAMP](#) Annual Technical Meeting, May 14-16, 2014.
144. J. P. Zheng, D. J. Crain, S. E. Rock, M. C. Turk and D. Roy, "Electrochemical Characterization of Fast-Discharge Electrodes for Lithium", Poster presented at the [CAMP](#) Annual Technical Meeting, May 14-16, 2014 [received 3rd prize in the best poster category].
143. S. Deluca, M. Sankarasubramanian, M. C. Turk, A. Sreeram, D. Roy and S. Krishnan, "Synthesis and Characterization of Dual-Conducting Polymer Electrolyte Membranes", Poster presented at the [CAMP](#) Annual Technical Meeting, May 14-16, 2014.

142. S. Krishnan, L. Wu, D. Roy, Simon Rock, “PEG and fluoroalkyl functionalized ionic liquids as electrolyte solvents for lithium ion batteries”, Talk presented at the 2014 Annual Meeting & Exhibition of the Minerals, Metals & Materials Society (TMS), Symposium Session: Nanostructured Materials for Rechargeable Batteries and for Supercapacitors, II; February 16-20, 2014, San Diego, CA.

141. L. Wu, R. I. Venkatanarayanan, J. L. Lebga-Nebane, X. Shi, J. B. McLaughlin, D. Roy and S. Krishnan, “Ionic Liquid Electrolytes for Lithium Ion Batteries—Effect of Lithium Salts On Thermal and Transport Properties”, Talk presented at the AIChE meeting [Session 12G04 - Physical Properties for Chemical Product Design], Nov 3-8, 2013, San Francisco, CA.

140. D. Roy, Material Characterization for Advanced Batteries in the Electro-Analytical Approach. Talk presented at the *Fall Meeting* of the Center for Advanced Material Processing, Potsdam, New York, October 14-15, 2013.

139. D. E. Simpson, M. C. Turk, and D. Roy, Examination of Salicylaldehyde as a Surface Modifier of Manganese for Controlling Galvanic Corrosion in Chemical Mechanical Planarization. Poster presented at the *Fall Meeting* of the Center for Advanced Material Processing, Potsdam, New York, October 14-15, 2013.

138. S. E. Rock, D. A. Gonyer, G. D. Zappi, J. T. Rijssenbeek and D. Roy, Electrochemical and Microstructural Features of a Nickel Cathode Examined in a Half-Cell Configuration of Sodium Metal Halide Batteries. Presented at the *NY-BEST Technology Conference*, Syracuse, New York, September 25, 2013.

137. M. C. Turk, S.E. Rock, G. D. Zappi, J. T. Rijssenbeek, D. Roy, Exchange Current and Activation Energy of the Main Cathode Reaction of a Sodium Nickel Chloride Battery: Voltammetric Measurements using a Half-Cell. Presented at the *NY-BEST Technology Conference*, Syracuse, NY, September 25, 2013.

136. S. E. Rock and D. Roy, Electrochemical Analysis of the “Corrosion” Mechanisms of Chemically Promoted CMP. Poster presented at the *18th International Symposium on Chemical-Mechanical Planarization*, Lake Placid, New York, August 11-14, 2013.

135. M. C. Turk, S. E. Rock, H. P. Amanapu, L. G. Teugels and D. Roy, A Percarbonate Based Slurry Solution for Controlling Galvanic Corrosion in the CMP of Ruthenium. Poster presented at the *18th International Symposium on Chemical-Mechanical Planarization*, Lake Placid, New York, August 11-14, 2013.

134. X. Shi and D. Roy, Analysis of Potential-pH Correlations and Mixed Potential Reactions for Designing Metal CMP Slurry Solutions. Poster presented at the *18th International Symposium on Chemical-Mechanical Planarization*, Lake Placid, New York (August 2013).

133. A. Cardin and D. Roy, Electrochemical Characterization of Corrosion Processes at Tantalum, Ruthenium and Copper Electrodes for Applications in Chemical Mechanical Planarization. Poster presented at *SURE Symposium*, Clarkson University, Potsdam, New York (August 2013)

132. Roy, D., Annual Technical Meeting of CAMP, Saratoga Springs, NY, "Electrochemical Examination of New Battery Materials", May 2013.

131. Shi, X., Rock, S. E., Turk, M. C., Roy, D., Presented at *CAMP Annual Technical Meeting*, Saratoga Springs, NY, "Galvanic Corrosion in Aluminum CMP for Replacement Metal Gates", May 2013.

130. Venkatanarayanan, I. R., Wu, L., Lebga-Nebane, J. L., Shi, X., Roy, D., Krishnan, S., Presented at *CAMP Annual Technical Meeting*, Saratoga Springs, NY, "Ionic Liquid Electrolytes for Lithium Ion Batteries - Effect of Lithium Salts on Thermal and Transport Properties", May 2013.

129. Krishnan, S., Losenge Lebga, J., Rock, S. E., Wu, L., McLaughlin, J., Roy, D., *AICHE 2012 Annual Meeting*, Pittsburgh, Pennsylvania, AIChE, Pittsburgh, Pennsylvania, "Thermophysical and Electrochemical Properties of Self-Assembling Amphiphilic Ionic Liquids", October 2012

128. Garland, J. E., Crain, D. J., Rock, S. E., Roy, D., *CAMP Technical Meeting*, Clarkson University, Potsdam, NY, "Electroanalytical Characterization of Resistive Power Losses in a Single Crystal Silicon Solar Cell", October 2012.

127. Rock, S. E., Roy, D., *17th International Symposium on Chemical-Mechanical Planarization*, Lake Placid, NY, "Electrochemical characterization of CMP specific surface films of guanidine formed on tantalum nitride", August 2012.

126. Shi, X., Rock, S. E., Turk, M. C., Roy, D., *17th International Symposium on Chemical-Mechanical Planarization*, Lake Placid, NY, "Reducing galvanic corrosion in the CMP of aluminum for replacement metal gate applications", August 2012.

125. Roy, D., *Annual Technical Meeting of CAMP*, CAMP, Albany, NY, "Electro-Analytical Characterization of Advanced Battery Materials", May 2012.

124. J. B. McLaughlin, S. Krishnan, L. Wu, L. V. N. R. Ganapatibhotla, X. Jia, D. Roy and J.P. Zheng, "Self-Consistent Field Modeling of Microstructure Formation in Fluorinated "Block" Ionic Liquids for Photovoltaic Cells", Talk presented at the 2011 AIChE Annual Meeting, October 16-21, 2011, Minneapolis, MN.

123. D. J. Crain, J. P. Zheng and D. Roy, "Characterization of Rapid-Recharge Li ion Batteries", Poster presented at the CAMP Fall Meeting, October 10-11, 2011.

122. J. E. Garland, D. J. Crain, S. E. Rock and D. Roy, "Electroanalytical Characterization of Resistive Power Losses in a Single Crystal Silicon Solar Cell", Poster presented at the CAMP Fall Meeting, October 10-11, 2011.
121. J. Franclemont, J. Losenge Lebga, S. Krishnan, S.R. Rock, D. Roy, "Protic Ionic Liquids for PEM Fuel Cells", Poster presented at the CAMP Fall Meeting, October 10-11, 2011.
120. D. J. Crain and D. Roy, "Electrochemistry of Ruthenium Examined in a Moderately Acidic Solution for CMP Applications", Poster presented at the 16th International Symposium on Chemical-Mechanical Planarization, Lake Placid, New York, August 7-10, 2011.
119. S.E. Rock, D.J. Crain, J.P. Zheng, C.M. Pettit, D. Roy, "Electrochemical investigation of the surface-modifying roles of guanidine carbonate in chemical mechanical planarization of tantalum", Poster presented at the 16th International Symposium on Chemical-Mechanical Planarization, Lake Placid, New York, August 7-10, 2011.
118. D. J. Crain, J.P. Zheng D. Roy, "Characterization of Electrode Materials for Li ion Batteries with Improved Cyclability", Poster presented at the *Annual Technical Meeting* of CAMP; May 19, 2011.
117. J. Losenge Lebga, S. Krishnan, J.P. Zheng, D. Roy, "Structure-Property Relationship in Protic Ionic Liquids for High-Temperature PEM Fuel Cells", Poster presented at the Annual Technical Meeting of CAMP; May 19, 2011.
116. L. Wu, S. Krishnan, X. Shi, D. Roy, "Electrochemical Properties of Novel PEGylated Electrolyte Blend for Dye Sensitized Solar Cells and Lithium Ion Batteries", Poster presented at the Annual Technical Meeting of CAMP; May 19, 2011.
115. J. E. Garland, D. J. Crain, S. E. Rock, D. Roy, "Electroanalytical Characterization of Resistive Power Losses in a Single Crystal Silicon Solar Cell", Poster presented at the Annual Technical Meeting of CAMP; May 19, 2011.
114. L. Ganapatibhotla, J. P. Zheng, D. Roy and S. Krishnan, "Solid Organic Electrolytes and Ionic Liquids, with Poly(ethylene glycol) and Semifluorinated Alkyl Side Chains, for Photovoltaic and Energy Storage Applications", Presented at the 2010 AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.
113. S.V. Babu and D. Roy, "Analysis of the planarization, dishing and line thinning of structures containing ultra-low-k films", Talk presented at the *Annual Fall Review Conference of the Semiconductor Research Corporation*, Albany Nanotech Center, October 26, 2010.

112. D. Roy, "Electro-Analytical Characterization of Solar Cells", Talk presented at the Center for Advanced Materials Processing Fall 2010 Symposium, Potsdam, NY; October 14, 2010.

111. J. E. Garland, D.J. Crain, and D. Roy, "Dye Sensitized Solar Cell Parameters Studied using Voltametry, Impedance Spectroscopy, and Open Circuit Voltage Decay", Poster presented at the Center for Advanced Materials Processing Fall 2010 Symposium, Potsdam, NY; October 14, 2010.

110. D.J. Crain, J. P. Zheng and D. Roy, "Characterization of Electrode Materials for Rapid-Recharge Li ion Batteries", Poster presented at the Center for Advanced Materials Processing Fall 2010 Symposium, Potsdam, NY; October 14, 2010.

109. J. Lebga, J.P. Zheng, D. Roy and S. Krishnan, "Protic Ionic Liquids and Membranes for High Temperature Proton Exchange Membrane Fuel Cells", Poster presented at the Center for Advanced Materials Processing Fall 2010 Symposium, Potsdam, NY; October 14, 2010.

108. L. Wu, L. Ganapatibhotla, J. P. Zheng, D. Roy and S. Krishnan, "Solid State Organic Electrolytes for Dye-Sensitized Solar Cells", Poster presented at the Center for Advanced Materials Processing Fall 2010 Symposium, Potsdam, NY; October 14, 2010.

107. J. P. Zheng, S. Rock, S. V. S. B. Janjam, S. V. Babu and D. Roy, "Electrochemical Impedance Studies of Surface Reactions for Chemically Enhanced CMP of Tantalum using Oxalic Acid as a Complexing Agent", Poster presented at the 15th International Symposium on Chemical Mechanical Planarization, August 9, 2010.

106. J. P. Zheng, S. V. S. B. Janjam, S. V. Babu and D. Roy, "Chemical Mechanisms of CMP of Cu and Ta in Tartaric Acid based Slurries Investigated with Electrochemical Techniques", Poster presented at the 15th International Symposium on Chemical Mechanical Planarization, August 9, 2010.

105. L. Ganapatibhotla, J. Zheng, D. Roy and S. Krishnan, "PEGylated and fluorinated ionic salts for dye-sensitized solar cells", Poster presented at the Northeast Regional Meeting (NERM 2010), Potsdam, NY June 2 -5, 2010

104. D. Roy, "Some Aspects of Battery Research at CAMP", Talk presented at *CAMP Technical Meeting*, Canandaigua, NY, May 19-21, 2010.

103. D. J. Crain, J. P. Zheng and D. Roy, "Characterization of Electrode Materials for Rapid-Recharge Li ion Batteries with Improved Cyclability", Poster presented at *CAMP Technical Meeting*, Canandaigua, NY, May 19-21, 2010.

102. J. E. Garland, D. J. Crain and D. Roy, "Temperature Dependencies of Dye Sensitized Solar Cell Parameters Studied using Voltametry, Photo-electrochemical

Impedance Spectroscopy, and Open Circuit Voltage Decay Techniques”, Poster presented at *CAMP Technical Meeting*, Canandaigua, NY, May 19-21, 2010.

101. L. Ganapatibhotla, J.P. Zheng, D. Roy and S. Krishnan, “PEGylated and Fluorinated Ionic Salts for Dye-Sensitized Solar Cells and Supercapacitors”, Poster presented at *CAMP Technical Meeting*, Canandaigua, NY, May 19-21, 2010: *Received first prize among 38 contributed posters.*

100. S.V. Babu and D. Roy, “Silicon Material Characterization for Solar Application”, Presented at the Semicon China 2010 Conference (Session V, Device Engineering and Application), Shanghai, China, during March 16-18, 2010.

99. C. V. V. S. Surisetty, D. Roy and S.V. Babu, “Detailed Investigation of the Chemistry for CMP of Cu Lines and Ta Barriers”, Talk presented at the Annual Fall Review Conference of the Semiconductor Research Corporation, Albany Nanotech Center, Albany, NY, October 26, 2009.

98. 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, Potsdam, NY, October 15, 2009.

97. 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 Center for Advanced Materials Processing Fall 2009 Symposium, Potsdam, NY, October 15, 2009.

96. J. P. Zheng, S. V. S. B. Janjam, S. V. Babu and D. Roy, “Chemical Mechanisms of CMP of Cu and Ta in Tartaric Acid based Slurries Investigated with Electrochemical Techniques.”, Poster presented at the 14th International Symposium on Chemical Mechanical Planarization, August 10, 2009.

95. C.M. Sulyma, C.M. Pettit, S. V. Babu and D. Roy, “Electrochemical Examination of the Roles of Oxyanions in Chemically Dominant Removal of the Surface Layers of a TaN Wafer”, Poster presented at the 14th International Symposium on Chemical Mechanical Planarization, August 10, 2009.

94. D. Roy, “Electrochemical Studies of CMP Systems”, Invited talk, IBM’s Materials Research Council Symposium Series, Presented at IBM, Albany NanoTech, NY; July 31, 2009.

93. D. Roy, “Materials Processing and Characterization for Advanced Lithium Ion Batteries and Photovoltaic Cells”, Talk presented at General Electric Global Research Center, Schenectady, NY; July 10, 2009.

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 *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 *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 *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. Moganty, 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 Funding

General Electric
NYSERDA
Army Research Office (ARO)
Semiconductor Research Corporation
The Solar Energy Consortium (TSEC)
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:

David Simpson - Ph.D. Candidate
Michael Turk- Ph.D. Candidate
Cody Johnson – Ph.D. Candidate
Shen Wei - Ph.D. Candidate
Daegan Gonyer – Ph.D. Candidate (in absentia; currently employed at Raytheon)

Former graduate students:

23. Xingzhao Shi - Ph.D. 2015. Post-graduation employment: Globalfoundries.
Thesis: *Experimental Studies of Selected Aqueous Electrochemical Systems Relevant for Materials Processing in the Fabrications of Microelectronic Components and Direct Alcohol Fuel Cells.*

22. Simon Rock - Ph.D. 2015. Post-graduation employment: Process Engineer, Micron Technology. Thesis: *Material Characterization in the Electro-Analytic Approach for Applications in Chemical Mechanical Planarization and Electrochemical Energy Systems.*
21. Daegan Gonyer, M.S. 2015. Post-graduation employment: Senior Systems Engineer, Raytheon (continuing for Ph.D.)
20. Tyler Mosher- M.S. 2013. Post-graduation employment: Lockheed Martin
19. Daniel Crain - Ph. D. 2012. Thesis: *Electro-Analytical Evaluation of Lithium Ion Batteries and Photovoltaic Cells.* Post-graduation employment: Intel Corp.
18. John Garland - Ph. D. 2011. Thesis: *Electro-Analytical Characterization of Solar Cells.* Post-graduation employment: Intel Corp.
17. Jianping Zheng – Ph.D., 2010. Thesis: *Studies of Aqueous and Non-Aqueous Electrochemical Interfaces for Applications in Microelectronic and Energy Storage Systems.* Post-graduation employment: Globalfoundries.
16. Christopher Sulyma – Ph.D., 2010. Thesis: *Electrochemical Studies of Cu, Ta and TaN Surfaces in Aqueous Solutions for Applications in Chemical-Mechanical and Electrochemical- Mechanical Planarization.* Post-graduation employment: Intel Corp.
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

25. Keith Juda* – Physics major
24. Andrew Cardin - Physics major, Hons. Program
23. George Calvey (Mechanical Eng./Physics double major, 2013)
22. Gregory Zenger (Electrical Engineering & Physics Double Major, 2009)
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)
(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)

* Students from the *McNair Scholars Program*

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)
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).

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, 2008, 2015).

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 Energy, Applied Spectroscopy, Applied Surface Science, 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....., and several other journals.

- ***External Reviewer*** for Physics Program at SUNY Plattsburgh, NY (2013)
- ***External Reviewer*** for Faculty Tenure/Promotion Candidates from several Universities in the United States and abroad

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
Advised about 60% of all (50-60) physics majors during 2000-2011
Advising on an average of 8-10 physics majors annually since 2011

Service: School of Arts and Sciences

- Arts and Sciences Awards Committee, Clarkson University (2012-present)
- 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 (1990-2014t)
- 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):

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