

Henry S. White

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Education

- 1978 B.S., Chemistry, University of North Carolina
- 1983 Ph.D., Chemistry, University of Texas at Austin

Professional Appointments

University of Utah

- Dean, College of Science, 2014-present
- Chair, Department of Chemistry, 2007-2013
- Distinguished Professor of Chemistry, 2006-present
- Professor of Chemistry, 1993-2006

University of Minnesota

- Associate Professor of Chemical Engineering and Materials Science (tenured), 1990-93
- Assistant Professor of Chemical Engineering and Materials Science, 1984-90

Massachusetts Institute of Technology

- Postdoctoral Associate, Department of Chemistry, 1983-84

Current Research Interests: Electrochemistry; electrical phenomena at interfaces and molecule/nanoparticle transport in high electric and magnetic fields; electrocatalysis; ion-channel recording methods for sensing structural analysis of DNA; nanopore resistive pulse methods; the physics and chemistry of electrogenerated nanobubbles.

Professional Honors:

- 2015 Allen J. Bard Award, The Electrochemical Society
- 2013 Utah Governor's Medal of Science and Technology
- 2012 Fellow of the American Chemical Society
- 2011 Fellow of the American Academy of Arts and Sciences
- 2011 Fellow of the American Association for the Advancement of Science
- 2009 Carl Wagner Memorial Award, The Electrochemical Society
- 2008 American Chemical Society Utah Award
- 2007 W.W. Epstein Outstanding Educator Award, University of Utah
- 2005 D.C. Grahame Award, Physical Electrochemistry Division of the Electrochemical Society
- 2004 American Chemical Society Analytical Division Award in Electrochemistry
- 2004 Distinguished Scholarly and Creative Research Award, University of Utah
- 2003 Students Choice Teaching Award, Associated Students of the University of Utah
- 2003 President, Society of Electroanalytical Chemistry
- 2002 Faraday Medal, Electrochemistry Group, Royal Society of Chemistry
- 2002 Professeur Invité de l'Ecole Normale Supérieure, Paris, France
- 2002 Chair, Gordon Research Conference on Electrochemistry
- 2000 C. N. Reilley Award, Society of Electroanalytical Chemistry
- 1992 Shell Chair of Chemical Engineering and Materials Science, University of Minnesota
- 1987 Office of Naval Research Young Investigator Award in Chemistry
- 1987 McKnight Land-Grant Professorship, University of Minnesota
- 1985 Shell Faculty Career Initiation Award, University of Minnesota
- 1982 Gilbert H. Ayres Award, University of Texas

Plenary and Honorary Lectures

- 2019 *Philip J Elving Lecture* at the University of Michigan, March 2019
2018 *Johannes Coetzee Memorial Lecture* at University of Pittsburgh, April 26, 2018
2018 *Centennial Lecture* at the University of Texas, Nov. 29, 2018.
2018 *JJ Hermans Colloquium*, University of North Carolina, Nov. 13, 2018
2017 *Graduate Student Hosted Colloquium*, Stanford University, Nov. 2017
2016 *Pittsburgh Conference Lecture* at the University of Akron, Oct. 18, 2016.
2015 *Award Lecture*, Allen J. Bard Award of the Electrochemical Society, Chicago, IL.
2014 *Distinguished Lecture*, Waterloo Institute for Nanotechnology, University of Waterloo
2013 *Molecular Science Frontier Lecture Professorship*, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China
2013 *Opening Keynote Lecture*, “ElecNano5,” Bordeaux, France
2012 *Plenary Lecture*, 13th International Symposium on Electroanalytical Chemistry, Changchun, China
2010 *Opening Plenary Lecture*, International Conference on Analytical Sciences and Spectroscopy, Edmonton, Canada
2010 *Vasser Wooley Lecture*, Georgia Tech University
2008 *Plenary Lecture*, International Society of Electrochemistry, Sevilla, Spain
2008 *Plenary Lecture*, Royal Society of Chemistry, Electrochem08, Liverpool, UK
2007 *Molecular Science Forum Lecture Professorship*, Institute of Chemistry, Chinese Academy of Sciences, Beijing
2007 *Plenary Lecture*, 14th Chinese Electrochemical Society Meeting, Yangzhou, China
2007 *Opening Plenary Lecture*, The Iberoamerican & 4th Argentine Meeting on Analytical Chemistry, Buenos Aires, Argentina
2007 *HEKA Lecture Series*, University of Quebec in Montreal
2006 *Kolthoff Lectures*, University of Minnesota
2005 *Opening plenary lecture*, 5th Asian Conference on Electrochemistry, Shanghai, China
2004 *Frontiers in Chemical Research Lectures*, Texas A&M University
2003 *Dow Lecture in Analytical Chemistry*, University of British Columbia
2001 *Research Frontiers in Chemistry Lectures*, University of Iowa
1999 *Albright & Wilson Lectures*, University of Warwick, Coventry, U.K.

Service

Major Departmental & University Since 2000

- Dean, College of Science, 2014-present.
- Chair, University of Utah Budget Principles & Process Working Group, 2014
- Internal Review Committee, Department of Chemical Engineering, 2014
- Chair, Department of Chemistry, 2007-2013
- Chair, Thatcher Building Planning and Construction Committee, 2009-13
- Chair, Chemistry Development Committee, 2007-13
- Crocker Science Center Executive Committee, 2013
- University Honorary Degree Committee, 2013
- University Limited Submission Awards Committee, 2010-13
- USTAR Alternative Energy Cluster Proposal and Faculty Search Committee, 2009-2010
- Internal Review Committee, Department of Biomedical Engineering, 2009
- USTAR NanoBio Cluster Proposal and Faculty Search Committee, 2006-2007
- Member of the University of Utah Graduate Council, 1997-2001

National and International

Editorial Service:

- Associate Editor, *Journal of the American Chemical Society*, 2002 – 2016.

- Publications Task Force, *The Electrochemical Society*, 2014-15.
- Editorial Committee, *Annual Review in Analytical Chemistry*, 2011- present
- Associate Editor, 1997–2001, *Journal of Electroanalytical Chemistry*,
- Editorial Boards
 - Analytical Chemistry*, 2005 – 2007
 - Langmuir*, 2000 - 2008
 - Journal of Electroanalytical Chemistry*, 1994-1997
 - Electrochemistry Communications*, 1998 - 2008

Educational Workshops and Summer Schools:

- “Electrochemical Measurements,” Case Western Reserve University, annually, 2006-2018
- “Fundamentals of Applied Electrochemistry,” Workshop sponsored by the Twin Cities Section of the Electrochemical Society, 2000, 2001, 2005, and 2006
- “Scanning Electrochemical Microscopy,” 2-week ACS-PRF summer school, Austin, TX, June 2003
- “Physical Chemistry at the Nanometer Lengthscale,” 1-week ACS-PRF summer school, Pullman, WA, July 2003

Service on National and International Review Panels:

- International Advisory Board, State Key Laboratory of Physical Chemistry of Solid Surfaces, Xiamen University, China, 2009-present
- Scientific Advisory Board, Oak Ridge National Laboratory DOE Energy Hub Planning, 2011 – 2013.
- Scientific Advisory Board, DOE NEES Energy Frontier Research Center (U. Maryland), 2011-2014.
- External Review Committee, Department of Chemistry, University of Minnesota, 3/2000 – 3/2003
- Tech. Review Panel, National Petroleum Council Study on Future Transportation Fuels, 20010-11
- Review Panel, NIH National Humane Genome Research Institute, March 22-23, 2011.
- Review Panel, U.S. Department of Energy for Energy Frontier Research Centers, 2/25-2/29/09
- Steering Committee of the XiamENS, 2007-09 (CNRS/Xiamen University International Laboratory)
- Subpanel Chair, DOE Basic Needs in Electrical Energy Storage, 4/21-4/25, 2007, Washington, DC
- On-site Review Committee, Stanford University Global Climate & Energy Project, 11/19-11/21, 2006
- On-site Member of NSF Analytical and Surface Chemistry Review Pane, 5/20 – 5/21, 2003
- On-site Reviewer for DOE Chemical Sciences Program, Brookhaven National Laboratory, 5/4 –5/6, 2002
- On-site Reviewer for DOE Chemical Sciences Program, Lawrence Berkeley National Laboratory, 3/6 – 3/9, 2001
- Visiting Committee, Department of Chemistry, Lehigh University, 3/2000 – 3/2003
- Review Panel, NSF Small Business Innovation Research Program, Washington D.C., 1986,1990, 1993
- Review Panel, NSF-EPRI, Research in Electrochemical Synthesis Program, 1994
- DOD Graduate Fellowship Review Panel, Durham, N.C., 1989

Service to Professional Societies and Symposia Organization:

- President, *Society of Electroanalytical Chemistry*, 2003-2005
- Chairman, *Twin Cities Section of the Electrochemical Society*, 1989-1990
- Vice-chairman, Twin Cities Section of the Electrochemical Society, 1988-1989
- Co-Founder and Co-Organizer (with Richard M. Crooks), *Potters Lodge Meeting on Electrochemistry*, Blue Mountain Lake, NY, 1996, 2001, 2003, 2005, 2007, 2009, 2010, 2011, 2013, 2016.
- Co-Chair (with D. Rolison, K. Stevenson, J. Long, and J. McPherson): *Electrochemistry-Enabled NanoS&T*. 235th National Meeting of the American Chemical Society, New Orleans, 2008
- Co-Chair (with D. Rolison, B. Dunn, J. Long): *Micro- and Nanodimensional Batteries*. ECS National Meeting, Los Angeles, 2005
- Chair, Gordon Research Conference on Electrochemistry, 2002, Ventura, CA
- International Advisory Committee for the “Workshop on Magnetism and Electrochemistry,” Galway, Ireland, May 20-23, 2001
- Co-Chairman (with Debra R. Rolison), Symposium: *Electrochemistry at Nanostructured Materials*, ACS National Meeting, Dallas, 1998

- Co-Chairman Symposium: *Electrochemistry of Organized Molecular Interfaces*, ACS Colloid and Surface Science Symposium, National Meeting, Salt Lake City, 1993
- Co-Chairman, Symposium: *Microelectrodes and Microenvironments*, Electrochemical Society National Meeting, New Orleans, 1993
- Co-Chairman, Symposium, *Scanning Tunneling Microscopy*, Electrochemical Society National Meeting, Montreal, 1990
- Co-Chairman, Symposium, *Scanning Tunneling Microscopy*, Electrochemical Society National Meeting, Chicago, 1988

Courses Recently Taught:

- *General Chemistry I* (Chem 1210)
- *General Chemistry II* (Chem 1220)
- *Chemical Separations and Measurements* (Chem 7700)
- *Separations* (Chem 7720)
- *Electrochemistry* (Chem 7730)
- *Instrumentation Electronics* (Chem 7760)

Peer-Reviewed Journal Publications

1. H. S. White and R. W. Murray, "Fluorescence and X-Ray Photoelectron Spectroscopy Analysis of Metal Oxide Electrodes Chemically Modified with Dansylated Alkylaminesilanes," *Anal. Chem.* **51**, 236-39 (1979).
2. F.-R. F. Fan, H. S. White, B. Wheeler, and A. J. Bard, "High Efficiency Photoelectrochemical Solar Cells with n-WSe₂ Electrodes in an Aqueous Iodide Medium," *J. Electrochem. Soc.* **127** 518-19 (1980).
3. F.-R. F. Fan, H. S. White, B. Wheeler, and A. J. Bard, "Photoelectrochemistry and Photovoltaic Systems with n- and p-type WSe₂ in Aqueous Solutions," *J. Am. Chem. Soc.* **102**, 5142-48 (1980).
4. H. S. White, F.-R. F. Fan, and A. J. Bard, "Photoelectrochemistry of n-Type WSe₂ in Acetonitrile," *J. Electrochem. Soc.* **128**, 1045-55 (1981).
5. A. J. Bard, F.-R. F. Fan, A. S. Gioda, G. Nagasubramian, and H. S. White, "On the Role of Surface States in Semiconductor Electrode Photoelectrochemical Cells," *Discuss. Faraday. Soc.* **70**, 19-33 (1981).
6. T. P. Henning, H. S. White, and A. J. Bard, "Biconductive Polymers Produced by Incorporation of Tetrathiafulvalenium in a Polyelectrolyte (Nafion) Matrix," *J. Am. Chem. Soc.* **103**, 3938-39 (1981).
7. T. P. Henning, H. S. White, and A. J. Bard, "Electrochemical Behavior of Solution Species at Nafion Tetrathiafulvalenium Bromide Polymers," *J. Am. Chem. Soc.* **104**, 5862-68 (1982).
8. H. S. White and A. J. Bard, "Electrogenerated Chemiluminescence and Chemiluminescence of the Ru(bpy)₃²⁺- Peroxydisulfate System in Acetonitrile-Water Solutions," *J. Am. Chem. Soc.* **104**, 6891-95 (1982).
9. H. S. White, J. Leddy, and A. J. Bard, "Investigation of Charge Transport Mechanisms in Nafion Polymer Modified Electrodes," *J. Am. Chem. Soc.* **104**, 4811-17 (1982).
10. H. L. Sanchez, H. Steinfink, and H. S. White, "Solid Solubility of Ge, Si, and Mg in Fe₂O₃ and Photoelectrochemical Behavior," *J. Solid State Chem.* **41**, 90-96 (1982).
11. H. S. White, H. D. Abruña, and A. J. Bard, "Improvement in Performance of n-WSe₂ by Electrochemical Polymerization of o-Phenylenediamine at Surface Imperfections," *J. Electrochem. Soc.* **129**, 265-71 (1982).
12. H. S. White, A. J. Ricco and M. S. Wrighton, "Characterization of p-type CdTe Electrodes in Acetonitrile Electrolyte Solutions," *J. Phys. Chem.* **87**, 5140-50 (1983).

13. H. S. White, W. G. Becker, and A. J. Bard, "Photochemistry of the $\text{Ru}(\text{bpy})_3^{2+}$ -Peroxydisulfate System in Acetonitrile-Water Solutions. Evidence for a Long-Lived Photoexcited Ion-Pair," *J. Phys. Chem.* **88**, 1840-46 (1984).
14. H. S. White, G. P. Kittlesen, and M. S. Wrighton, "Chemical Derivatization of an Array of Three Gold Microelectrodes with Polypyrrole: Fabrication of a Molecule-Based Transistor," *J. Am. Chem. Soc.* **106**, 5375-77 (1984).
15. T. J. Lewis, H. S. White, and M. S. Wrighton, "Comparison of the Charge Transport Rate in Two Redox Levels of Polymers Derived from N,N'-Dibenzyl-4,4'-bipyridinium and N,N'-Dialkyl-4,4'-Bipyridinium," *J. Am. Chem. Soc.* **106**, 6947-52, (1984).
16. G. P. Kittlesen, H. S. White and M. S. Wrighton, "Chemical Derivatization of Microelectrode Arrays by Oxidation of Pyrrole and N-Methylpyrrole: Fabrication of Molecule-Based Electronic Devices," *J. Am. Chem. Soc.* **106**, 7389-96 (1984).
17. A. J. Ricco, H. S. White, and M. S. Wrighton, "X-ray Photoelectron and Auger Electron Spectroscopy Study of the CdTe Surface Resulting from Various Surface Pretreatments: Correlation of Photoelectrochemical and Capacitance-Potential Behavior with Surface Chemical Composition," *J. Vac. Sci. and Tech.* **2**, 910-15 (1984).
18. J. W. Thackeray, H. S. White, and M. S. Wrighton, "Poly(3-methylthiophene) Coated Electrodes: Optical and Electronic Properties as a Function of Redox Potential and Amplification of Electrical and Chemical Signals Using Poly(3-methylthiophene)-Based Microelectrochemical Transistors," *J. Phys. Chem.* **89**, 5133-40 (1985).
19. G. P. Kittlesen, H. S. White, and M. S. Wrighton, "A Microelectrochemical Diode Based on the Connection of Two Microelectrodes using Dissimilar Redox Polymers: A Two Terminal Electrochemical Device with Submicron Contact Spacing," *J. Am. Chem. Soc.* **107**, 7373-80 (1985).
20. R. T. Atanasoski, H. S. White, and W. H. Smyrl, "Microelectrodes in Corrosion Studies: Electrodeposition and Corrosion of Cu in $\text{H}_2\text{O}_2/\text{O.1N HCl}$," *J. Electrochem. Soc.* **133**, 2435-36 (1986).
21. M. Maeda, D. J. McClure, and H. S. White, "Electrochemical Behavior and Surface Structure of Pt Thin Films Deposited on Molecularly Smooth Mica," *J. Electroanal. Chem.* **200**, 383-87 (1986).
22. R. A. Malmsten and H. S. White, "Voltammetric Studies Beyond the Solvent Limits with Microelectrodes," *J. Electrochem. Soc.* **133**, 1067-68 (1986).
23. R. A. Malmsten, C. P. Smith, and H. S. White, "Electrochemistry in Concentrated Organic Redox Solutions," *J. Electroanal. Chem.* **215**, 223-35 (1986).
24. R. Morris, D. J. Franta, and H. S. White, "Electrochemistry at Platinum Band Electrodes of Width Approaching Molecular Dimensions. Breakdown of Transport Equations at Very Small Electrodes," *J. Phys. Chem.* **91**, 3559-64 (1987).
25. M. Hagemeister and H. S. White, "CdS/Poly(vinylferrocene)/Au and CdS/Poly-pyrrole/Au Solid-State Cells," *J. Phys. Chem.* **91**, 150-54 (1987).
26. T. Hunter, P. S. Tyler, W. H. Smyrl, and H. S. White, "Digital Impedance Spectroscopy of Poly(vinylferrocene) Modified Electrodes: The Dependence of Charge-Transport Rate and Exchange Current Density on Polymer Oxidation State," *Electrochem. Soc.* **134**, 2198-204 (1987).
27. C. P. Smith, Lj. Atanasoska, M. Maeda, H. S. White, and D. J. McClure, "Ultra-Thin Pt Films on Mica and Measurement of Surface Forces at the Pt/Water Interface," *J. Phys. Chem.* **92**, 199-205 (1988).
28. R. B. Morris, K. F. Fischer, and H. S. White, "Electrochemistry of Organic Redox Liquids. Reduction of 4-Cyanopyridine," *J. Phys. Chem.* **92**, 3506-13 (1988).
29. J. D. Seibold, E. R. Scott, and H. S. White, "Diffusional Transport to Nanoscopic Band Electrodes," *J. Electroanal. Chem.* **264**, 281-89 (1989).
30. Z. Deng, W. S. Smyrl, and H. S. White, "Stabilization of Metal-Metal Oxide Surfaces Using Electroactive Polymer Films," *J. Electrochem. Soc.* **136**, 2152-58 (1989).

31. H. Kragt, D. J. Earl, J. D. Norton, and H. S. White, "Phase Detection Microscopy of Electrode Surfaces. Measurement of Localized Dissolution of Iron Microelectrodes," *J. Electrochem. Soc.* **136**, 1752-55 (1989).
32. E. R. Scott, H. S. White, and D. J. McClure, "Scanning Tunneling Microscopy of Platinum Films on Mica: Evolution of Topography and Crystallinity During Film Growth," *J. Phys. Chem.* **93**, 5249-52 (1989).
33. S.-H. Suh, L. Mier-y-Teran, H. S. White, and H. T. Davis, "Molecular Dynamics Study of the Primitive Model of 1:3 Electrolyte Solutions," *J. Chem. Phys.* **142**, 203-211 (1990).
34. C. P. Smith, H. L. Kennedy, H. J. Kragt, and H. S. White, "Phase-Measurement Interferometric Microscopy of Microlithographically Fabricated Pt Electrodes," *Anal. Chem.* **62**, 1135-38 (1990).
35. S. Snyder, S. Lopez, H. D. Abruña, and H. S. White, "Scanning Tunneling Microscopy of Dimeric and Polymeric Films Resulting from Reduction of $\text{Re}(\text{CO})_3(\text{v-bipyridine})\text{Cl}$," *J. Am. Chem. Soc.* **112**, 1333-37 (1990).
36. L. Mier-y-Teran, S. H. Suh, H. S. White, and H. T. Davis, "A Nonlocal Free-Energy Density-Functional Approximation for the Electrical Double Layer," *J. Chem. Phys.*, **92**, 5087-5098 (1990).
37. J. D. Norton, H. S. White, and S. W. Feldberg, "Effect of Electrical Double-Layer on Molecular Transport to Microelectrodes," *J. Phys. Chem.* **94**, 6772-6780 (1990).
38. H. S. White, D. J. Earl, J. D. Norton, H. J. Kragt, "In-Situ Topographical Imaging of Electrode Surfaces Using High Resolution Phase-Detection Interferometric Microscopy," *Anal. Chem.* **62**, 1130-34 (1990).
39. Z. Tang, L. Mier-y-Teran, H. T. Davis, L. E. Scriven, and H. S. White, "Non-Local Free-Energy Density Functional Theory applied to the Electrical Double Layer. Part I: Symmetrical Electrolytes," *Molecular Physics*, **71**, 369-92 (1990).
40. L. Mier-y-Teran, Z. Tang, H. S. White, and H. T. Davis, "Non-Local Free Energy Density Functional Approximations for the Electrical Double Layer. Part II: 2:1 Electrolytes," *Molecular Physics*, **72**, 817-30 (1991).
41. H. J. Kragt, C. P. Smith, and H. S. White, "Refractive Index Mapping of Concentration Profiles," *J. Electroanal. Chem.* **278**, 403-407 (1990).
42. C. P. Smith, D. C. Fritz, M. V. Tirrell, and H. S. White, "Phase Measurement Interferometric Microscopy of Thin Films. Analysis of Thickness, Refractive Index, and Microtopography of Polystyrene Films," *Thin Solid Films* **198**, 369-386 (1991).
43. D. J. Earl, H. J. Kragt, C. W. Macosko, and H. S. White, "Electrochemical Behavior of a Cylindrical Microelectrode in Laminar Flow Fields," *Ind. and Chem. Res.* **30**, 264-67 (1991).
44. E. R. Scott, H. S. White, and B. Phipps, "Scanning Electrochemical Microscopy of A Porous Membrane," *J. Memb. Sci.* **58**, 71-87 (1991).
45. J. D. Norton, W. E. Benson, and H. S. White, B. Pendley and H. D. Abruña "Voltammetric Measurement of Bimolecular Electron-Transfer Rates in Low Ionic Strength Solutions," *Anal. Chem.* **63**, 1909-14 (1991).
46. B. Pendley, H. D. Abruña, J. D. Norton, W. E. Benson, and H. S. White, "Voltammetric Analysis of Halfwave Potentials in Low Ionic Strength Solutions. Measurement of Ion Impurity Concentration," *Anal. Chem.* **63**, 2766-71 (1991).
47. N. Casillas, S. R. Snyder, W. H. Smyrl, and H. S. White, "Correlation of Electron-Transfer Rates with the Density of States of Native and Anodically Grown TiO_2 Films," *J. Phys. Chem.* **95**, 7002-07 (1991).
48. S. R. Snyder, T. Foecke, H. S. White, W. W. Gerberich, "Imaging of Stacking Faults in Highly Oriented Pyrolytic Graphite using Scanning Tunneling Microscopy," *J. Mat. Res.* **7**, 341-4 (1992).
49. N. Casillas, S. R. Snyder, and H. S. White, "Fabrication of Molecular Size Platinum Microdisk Electrodes Using the Scanning Tunneling Microscope" *J. Electrochem. Soc.* **138**, 641-2, (1991).
50. J. D. Norton and H. S. White, "Effect of Comproportionation on the Voltammetric Reduction of Methyl Viologen in Low Ionic Strength Solutions," *J. Electroanal. Chem.* **325**, 341-50 (1992).

51. E. R. Scott, H. S. White, and J. B. Phipps, "Direct Imaging of Ionic Pathways in Stratum Corneum Using Scanning Electrochemical Microscopy," *Solid State Ionics*, **53-56**, 176-83 (1992).
52. J. D. Norton, S. A. Anderson, and H. S. White, "Electron Conduction in Organic Solutions," *J. Phys. Chem.*, **96**, 3-6 (1992).
53. L. Zhang, H. S. White, and H. T. Davis, "Simulation of Confined Primitive Electrolytes: Application of a New Method of Summing the Coulomb Field," *Molecular Simulations*, **9**, 247-55 (1992).
54. H. T. Davis, H. S. White, and L. Zhang, "Simulations of Solvent Effects on Confined Electrolytes," *J. Chem. Phys.*, **98**, 5793-9 (1993).
55. J. Hossick Schott and H. S. White, "Field Induced Reconstructions During STM Experiments of Au(111) Surfaces," *Langmuir*, **8**, 1955-1960 (1992).
56. J. Hossick Schott, C. Arana, H. D. Abruña, H. Hurrell Petach, C. M. Elliott, and H. S. White, "Substrate Induced Ordering of Molecular Adsorbates on Au(111)," *J. Phys. Chem.*, **96**, 5222-4 (1992).
57. S. Li, H. S. White, and M. D. Ward, "Scanning Tunneling Microscopy of the Organic Conductor TMTSFX ($X = \text{ClO}_4^-$ and ReO_4^-)," *J. Phys. Chem.*, **96**, 9014-21 (1992).
58. S. Li, H. S. White, and M. D. Ward, "Scanning Tunneling Microscopy of the Organic Semiconductor [(h-C₅Me₅)₂Ru(1,4-[22]-cyclophane)][TCNQ]₄," *Chem. of Materials*, **4**, 1082-1091 (1992).
59. C. P. Smith and H. S. White, "Theory of the Voltammetric Response of Electrodes Coated with Electroactive Molecular Films" *Anal. Chem.*, **64**, 2398-2405 (1992).
60. C. P. Smith and H. S. White, "Voltammetry of Molecular Films Containing Acid/Base Groups," *Langmuir*, **9**, 1-3 (1993).
61. J. Hossick Schott and H. S. White, "Electric Field Phenomena in STM: Tip Deformations and Au(111) Surface Phase Transitions During Tunneling Spectroscopy Experiments," *Langmuir*, **9**, 3471-7 (1993).
62. S. Li, C. W. Macosko, and H. S. White, "Electrochemical Processing of Conducting Polymer Fibers," *Science*, **259**, 957-60 (1993).
63. S. R. Snyder, W. W. Gerberich, and H. S. White, "STM Tip-Induced Transitions of Dislocation Network Structures on the Surface of Highly Oriented Pyrolytic Graphite," *Phys. Rev. B*, **47**, 10, 823-31 (1993).
64. L. R. Zhang, M. Jinno, H. T. Davis, and H. S. White, "Molecular Dynamics and Hypernetted Chain Equations Studies of Soft Core Repulsions in Electrolyte Solutions," *Molecular Simulation*, **12**, 1-21 (1994).
65. J. Hossick Schott and H. S. White, "Halogen Adlayers on Ag(111)," *J. Phys. Chem.*, **98**, 291-96 (1994).
66. E. R. Scott, H. S. White, and J. B. Phipps, "Measurement of Ionophoretic Transport through Porous Membranes Using Scanning Electrochemical Microscopy: Application to *in vitro* Studies of Ion Fluxes through Skin," *Anal. Chem.*, **65**, 1537-45 (1993).
67. S. Li and H. S. White, "Synthesis of Conducting Polymer Composite Fibers in an Electrochemical Flow Cell," *J. Electrochem. Soc.*, **140**, 2473-6 (1993).
68. E. R. Scott, A. I. Laplaza, H. S. White, and J. B. Phipps, "Transport of Ionic Species in Skin. Contribution of Pores to the Overall Skin Conductance," *Pharm. Res.*, **10**, 1699-1709 (1993).
69. S. Li, C. W. Macosko, and H. S. White, "Electrochemical Processing of Electrically Conductive Polymer Films," *Adv. Materials*, **5**, 575-6 (1993).
70. A. J. Bard, H. D. Abruna, C. E. Chidsey, L. R. Faulkner, S. D. Feldberg, K. Itaya, M. Majda, O. Melroy, R. W. Murray, M. D. Porter, M. P. Soriaga, and H. S. White, "The Electrode/Electrolyte Interface - A Status Report," *J. Phys. Chem.*, **97**, 7147-73 (1993).
71. J. Hossick Schott and H. S. White, "Resonant Tunneling through Chemisorbed Halogen Atoms on Ag(111)," *J. Phys. Chem.*, **98**, 297-302 (1994).

72. N. Casillas, S. J. Charlebois, W. H. Smyrl, and H. S. White, "Scanning Electrochemical Microscopy of Precursor Sites for Pitting Corrosion on Titanium," *J. Electrochem. Soc.* **140**, L142-5 (1993).
73. E. R. Scott, J. B. Phipps, and H. S. White, "Direct Imaging of Molecular Fluxes through Skin," *J. Invest. Dermatology*, **104**, 142-45 (1995).
74. W.-W. Lee, M. D. Ward, and H. S. White, "Depletion Layer Effects on the Response of the Electrochemical Quartz Crystal Microbalance," *Anal. Chem.* **65**, 3232-37 (1993).
75. C. P. Smith and H. S. White, "Theory of the Voltammetric Response of Electrodes of Submicron Dimensions, Violation of Electroneutrality in the Presence of Excess Supporting Electrolyte," *Anal. Chem.* **65**, 3343-53 (1993).
76. N. Casillas, S. Charlebois, W. H. Smyrl, and H. S. White, "Pitting Corrosion of Titanium," *J. Electrochem. Soc.* **141**, 636-42 (1994).
77. J. Hossick Schott and H. S. White, "Halogen Chemisorption on Silver (111). Scanning Tunneling Microscopy of Coadsorbed Halogen Atoms," *Langmuir*, **10**, 486-91 (1994).
78. S. R. Snyder and H. S. White., "Structure and Electrochemical Behavior of Protoporphyrin(IX)Fe(III)Cl Films," *J. Phys. Chem.* **99**, 5626-32, (1995).
79. X. Gao, H. S. White, S. Chen, and H. D. Abruña, "Electric Field-Induced Transitions of Phospholipid Layers on Hg Electrodes," *Langmuir*, **11**, 4554-63 (1995).
80. Q. Li and H. S. White, "Interferometric Measurement of Voltammetric Data in Concentrated Organic Redox Solutions," *Anal. Chem.* **34**, 561-69 (1995).
81. L. Zhang, H. Ted Davis, D. M. Kroll, and H. S. White, "Molecular Dynamics Simulations of Water in a Spherical Cavity," *J. Phys. Chem.* **99**, 2878-84 (1995).
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Patents:

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Invited Seminars and Conference Presentations.

- Introductory Lecturer, Faraday Discussion meeting on “Electrochemistry at Nano-interfaces” June, 26-28 2018, University of Bath
- Johannes Coetzee Memorial Lecture at University of Pittsburgh, April 26, 2018.
- Philip J Elving Lecture at the University of Michigan, March 20, 2018.
- Graduate Student Hosted Colloquium, Stanford University, Nov. 2017
- Electrochemical symposium (Keynote Speaker) of the 100th Canadian Society of Chemistry, May 28th-June 1st, 2017, Toronto.
- Pittsburgh Conference Lecture at the University of Akron, Oct. 18, 2016.
- “Electrochemistry of Single Nanobubbles. Estimating the Critical Size of Bubble-Forming Nuclei for Gas-Evolving Electrode Reactions,” RSC Faraday Discussion – Single Entity Electrochemistry, York, England, Sept 2, 2016.
- “Electrochemistry in Confined Spaces,” Gordon Research Conference on Electrochemistry, Ventura, Jan. 2016.
- “Coulter Counter Voltage Trapping of Nanoparticles with Sub-Nanometer Size Resolution,” Pittcon, Atlanta, GA, 2016.
- “Electric Double Layer Effects on Ion Transport in Nanometer Wide Electrochemical Cells,” U. of Warwick, UK. July 2015.
- “Resistive Pulse Particle Analysis with Sub-nanometer Size Resolution,” U. of Warwick, UK. July 2015.
- “Application of the Latch Sensing Zone in α -Hemolysin for Analysis of dsDNA,” U. Maryland at Baltimore County, Sept. 2015
- “The electrochemical nucleation and physical behavior of hydrogen nanobubbles,” 2015 Electrochemical Society Meeting, Chicago, IL May 2015.
- “Particles and Bubbles,” Potters Lodge Meeting, Blue Mountain, NY. Sept. 2015
- “Electrical Double Layer Effects on Ion Transport in Thin-Layer Solid-State Electrolytes,” American Vacuum Society 62nd Meeting, San Jose, CA. Oct. 2015.
- “The electrochemical nucleation and physical behavior of hydrogen nanobubbles,” 2015 Northwest Regional ACS meeting, Pocatello, ID. June, 2015.
- “Electric Field Effects on Ion Transport in a Nanometer Wide Thin Layer Electrochemical Cell”, PittCon, New Orleans, FL March. 2015.
- “Chemical Noise in Ion Channel Recordings”, PittCon, New Orleans, FL March. 2015.
- “Electrochemistry in Confined Spaces,” Gordon Research Conference on Batteries, Ventura, March 2014.
- "Single-Molecule DNA Enzymatic Analysis Using a Protein Nanopore". *Distinguished Lecture*, Waterloo Institute for Nanotechnology, University of Waterloo, Oct. 2014.
- "Single-Molecule DNA Enzymatic Analysis Using a Protein Nanopore", Georgia Tech University, Oct. 2014.
- “A Hydrogen Nanobubble,” U. Florida (CR Martin Symposium), Nov. 2014.
- “Electrochemistry in Confined Spaces and H₂ Nanobubbles,” Argonne National Laboratory, Nov. 2013.
- Cornell University, Department of Chemical and Biomolecular Engineering, Feb. 2013.
- *Molecular Science Frontier Lecture Professorship*, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China, Dec. 2013
- Keynote Lecture at “ElecNano5,” May 15 -17, 2013, Bordeaux, France.
- York University, Department of Chemistry, Toronto, Canada, Feb. 28, 2013.
- PittCon, Philadelphia, PA, March 21, 2013.
- “Electrochemistry in Confined Spaces”, NEES EFRC Fall Meeting, University of Maryland, Oct. 22, 2012.
- “Transport in 30-Nanometer-Wide Electrochemical Cells,” PittCon, Orlando, FL, March 11-12, 2012.
- “Controlling the Spatial Distribution of Molecules and Particles using Electrochemistry and Nanoscale Structures,” PittCon, Orlando, FL, March 11-12, 2012.
- “Au Nanoparticle Capture in a Protein Ion Channel and a Negative Differential Resistance Nanopore,” 4th Annual Workshop on Electrochemistry, Austin, TX Feb. 11-12.
- Plenary lecture, “High-Field Coulomb Transport in Ultrathin Electrochemical Cells,” 13th International Symposium on Electroanalytical Chemistry, Changchun, China, Aug. 19-22, 2012.
- Gordon Research Conference, Session Chair, Ventura, CA, January 8-13, 2012.

- “High-Field Coulomb Transport in Ultrathin Electrochemical Cells,” Potters Lodge Meeting, Blue Lake, NY, September 7-11, 20011.
- “High-Field Coulomb Transport in Ultrathin Electrochemical Cells,” Pittsburgh Conference, Atlanta, March 13, 2011.
- Cotton Medalist Symposium, Texas A&M University, College State, TX April 6, 2011.
- “Structural Analysis of Single-Base DNA Damage using Protein Nanopores,” 241st ACS Meeting, Anaheim, CA, March 2011.
- Opening Plenary Lecture “Nanopore Analysis of DNA Base Modifications,” International Conference on Analytical Sciences and Spectroscopy, Edmonton, Alberta, August 15, 2010.
- “Structural Analysis of Single-Base DNA Damage using Protein Nanopores,” Trinity College, November 4, 2010.
- “Nanopore Methods for Chemical Analysis,” Students Potters Lodge Meeting on Electrochemistry, Sept., 2010, Blue Lake, NY, Sept. 8. 2010.
- “Nanopore Analysis of DNA Base Modifications,” 240th ACS Meeting, Boston, MA, Aug. 25, 2010.
- “Electrochemistry in Nanopores and Ion Channel Biosensors”, Bioanalytical Gordon Research Conference, Colby-Sawyer College, New London, NH, June 20-25, 2010.
- “Electrochemistry in Nanoscale Domains,” Stress Corrosion Conference, Sun Valley, June 13-18, 2010.
- “Nanopore Structural Analysis of DNA” Department of Chemistry, University of Nebraska, April 23, 2010.
- “Nanopore-Based Chemical Analysis,” 217th ECS Meeting, Vancouver, Canada, April 2010.
- “Nanopore Structural Analysis of DNA” Department of Chemistry, University of Washington, March 29, 2010.
- Inaugural Vasser Wooley Lecture, “Nanopore Structural Analysis of DNA” Department of Chemistry, Georgia Tech University, March 11, 2010.
- “Nanopore Structural Analysis of DNA” Department of Chemistry, Indiana University, April 8, 2010.
- “Ion Channel Recordings using Glass Nanopores,” Department of Chemistry, Arizona State University, Nov. 6, 2009.
- “Single-Molecule Biosensing and Nanopore Methods,” Potters Lodge Meeting on Electrochemistry, Sept.9-13, 2009.
- “Ion Channel Recordings for DNA Sequencing and Cancer Diagnostics”, Applications for Nanotechnology for Cancer Research, University of Utah, April 27, 2009.
- “Electrical Sensors using Synthetic and Biological Nanopores” University of California, Irvine, April, 1, 2009.
- “Electrochemistry in Nanopores and Ion Channel Biosensors”, University of Kansas, April 8, 2009;
- “Electrochemistry in Nanopores and Ion Channel Biosensors”, Kansas State University, April 7, 2009.
- “Ion Channel Recordings using Glass Nanopores, PITTCON, March 11, 2009.
- “Sensitivity and Signal Complexity as a Function of the Number of Ion Channels in a Stochastic Sensor, PITTCON, Chicago, March 8, 2009.
- “Electrochemistry and Ion Channel Recordings using Synthetic and Biological Nanopores” University of North Carolina, March 2, 2009.
- “Electrochemistry and Ion Channel Recordings using Synthetic and Biological Nanopores” University of Arizona, Feb. 19, 2009.
- “Double Layer Controlled Responses at NanoDisk Electrodes and Nanopores,” Zing Conference on Electrochemistry; Feb. 9, 2009.
- “Electrochemistry and Ion Channel Recordings using Synthetic and Biological Nanopores”, Adams College, Feb. 5, 2009.
- “Ion Channel Biosensors” SWAP 2009, San Jose State University, Jan. 16, 2009.
- RSC Electrochem08, Plenary Lecture, “Electrochemistry in Synthetic and Biological Nanopores,” Liverpool, UK, Sept. 16, 2008.
- International Society of Electrochemistry, Plenary Lecture, Sevilla, Spain, Sept. 9, 2008.
- “Electrochemistry in Synthetic and Biological Nanopores,” Queens College, Jan. 2008.
- “Electroanalytical Chemistry using Glass Nanopores,” 235th National Meeting of the ACS, New Orleans, April, 2008.
- “Single Ion Channel Sensors Using Glass Nanopore Membranes,” PittCon, New Orleans, March 2008.

- “Electrochemistry in Synthetic and Biological Nanopores,” University of California, Santa Barbara, Jan. 2008.
- “Single Ion Channel Sensors Using Glass Nanopore Membranes,” Molecular Sciences Forum Lecture, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China, November 6, 2007.
- “Glass Nanopore Electrodes and Membrane Sensors,” Workshop on Frontiers in Analytical Chemistry, Nanjing University, Nanjing, China, November 3, 2007.
- “Single Ion Channel Sensors Using Glass Nanopore Membranes,” Opening Plenary Lecture, 14th Chinese Electrochemical Society Meeting, Yangzhou, China, November 2, 2007.
- “Publishing in JACS,” 14th Chinese Electrochemical Society Meeting, Yangzhou, China, November 2, 2007.
- “Single Ion Channel Sensors Using Glass Nanopore Membranes,” Department of Chemistry, Xiamen University, Xiamen, China, October 30, 2007.
- “Single Ion Channel Sensors Using Glass Nanopore Membranes,” Opening Plenary Lecture, 4th Argentine Meeting on Analytical Chemistry, Buenos Aires, Argentina, August 27-30, 2007.
- “Two Decades of Electrochemistry at Cornell University,” 234th ACS National Meeting, Boston, MA, August 19-23, 2007.
- “Electrochemistry in Glass Nanopores,” Post Modern Electrochemistry Conference Symposium, 90th Canadian Conference, Winnipeg, Manitoba, May 26-30, 2007
- “Electrochemistry in Synthetic and Biological Pores,” Johns Hopkins University, February 21, 2007.
- “Single Ion Channel Sensors Using Glass Nanopore Membranes,” Western Washington University, Bellingham, WA, February 2, 2007.
- “Single Ion Channel Sensors using Glass Nanopore Membranes,” Gordon Research Conference on Electrochemistry, Ventura, CA, January 17, 2007.
- “Nanopore Electrodes and Transport Through Single Ion Channels” McBain Award Symposium, London, Dec. 12, 2006.
- “Electrochemistry in Nanopores,” Boston Scientific, Minneapolis, MN, Aug. 15, 2006.
- “Nanopore Electrode Sensors” Dept. of Chem., University of Texas at Arlington, March 24, 2006.
- “Electrochemistry Principles”, Electronic Bio Sciences, San Diego, Jan. 19, 2006.
- “Electrochemistry in Glass Pores of Nanometer Dimensions,” Dept. of Chem., Northwestern University, Dec. 13, 2005.
- “Nanopore Electrode Sensors” Department of Chemistry, University of Calgary, Nov. 2005.
- “Nanopore Electrode Sensors” Department of Electrical Engineering, Arizona State University, Sept. 24, 2005.
- “Electrochemistry in Glass Pores of Nanometer Dimensions,” 49th Robert A. Welch Foundation Conference on Chemical Research: “Charge Transfer at Electrodes and Biological Interfaces,” Houston, TX, October 24, 2005.
- “Preparation of Nanopore Sensors and Applications,” 4th Potter’s Lodge Meeting on Electrochemistry, , Blue Lake Mountain, NY, Sept. 2005.
- “Electrochemistry in Nanopores,” Gordon Research Conference, Roscoff, France, June 12 - 17, 2005.
- “Random Walks and Electron Transfer Rates at Nanometer-Scaled Electrodes,” *Grahame Award Lecture*, National ECL Meeting, Quebec City, Canada, May 16, 2005.
- “Random Walks and Electron Transfer Rates at Nanometer-Scaled Electrodes,” 5th Asian Conference on Electrochemistry, Shanghai, China, May 9, 2005. (*Opening plenary lecture*)
- “Electrochemistry in Tight Spaces,” Dept. of Chemistry, University of North Texas, Denton, TX, April 22, 2005.
- “Electrochemistry in Tight Spaces,” Dept. of Chemistry, UC at San Cruz, March 29, 2005.
- “Electrochemistry in Pores of Nanometer Dimensions,” National ACS Meeting, San Diego, March 14, 2005.
- “Electrochemistry in Pores of Nanometer Dimensions,” Southwest Research Institute, San Antonio, March 6, 2005.
- “The Nanopore Electrode,” Pittsburgh Conference, Orlando, FL, Feb. 2005.
- “Analytical Applications of Nanopores,” Pittsburgh Conference, Orlando, FL, Feb. 2005.
- “Electrochemistry in Nanoscale Domains,” Conference on Advanced Materials and Nanotechnology, Queenstown, New Zealand, Feb. 10, 2004.

- “Electrochemistry in Tight Spaces,” Dept. of Chemistry, Queens University, February 4, 2005.
- “Electrochemistry in Tight Spaces,” Dept. of Chemistry, University of Oregon, Jan. 24, 2005.
- “Chemical Analysis Based on Transport in Nanoscale Domains,” Dept. of Math, University of Utah, Nov. 2004.
- “Visualization of Molecular Transport in Skin,” Dept. of Chemistry, Case Western Reserve University, October 2004
- “Electrochemistry in Pores of Nanometer Dimensions,” ACS National Meeting, Philadelphia, August 2004.
- “Electrochemistry in Nanoscale Domains,” Gordon Research Conference on Corrosion, New London, NH, July 2004.
- “The Role of the Electrical Double Layer and Ion Pairing on the Electrochemical Oxidation of Hexachloroiridate(III) at Pt Electrodes of Nanometer Dimensions,” San Antonio, TX, May 2004.
- “Electrochemistry in Tight Spaces,” Nichols Award Symposium, White Plains, NY, April 2004.
- “Visualization and Quantification of Molecular Transport in Membranes using Scanning Electrochemical Microscopy,” United Kingdom’s Annual Scanning Probe Microscopy Meeting, The University of Nottingham, March 2004.
- “Visualization of Molecular Transport in Skin,” Dept. of Biomedical Engineering, U. of Memphis, University, February 2004.
- Frontiers in Chemical Research Lectures (3 lectures), Texas A & M University, Feb. 9 – 11, 2004.
- Dow Lectures in Analytical Chemistry, (2 lectures) University of British Columbia, Nov., 2003.
- “Visualization of Molecular Transport in Skin,” Dept. of Chemistry, Simon Frasier University, November, 2003
- “Visualization of Molecular Transport in Skin,” Dept. of Physics, University of Utah, December, 2003
- “Visualization of Molecular Transport in Skin,” Dept. of Pharmacology and Toxicology, University of Utah, October, 2003
- “Voltammetric Measurement of the Kinetics of Al_2O_3 Dissolution,” Electrochemical Society National Meeting, Orlando, FL, October, 2003.
- “Electronic Defect Structures in Oxide Films,” Potters Lodge Meeting on Electrochemistry, Blue Lake Mountain, NY, Sept. 2003.
- “Electrochemistry at Electrodes of Nanometer Dimensions,” Mini-conference on Nanoscience and Nanotechnology, University of Utah, SLC, April, 2003.
- “Electrochemistry at Electrodes of Nanometer Dimensions,” 225th ACS Meeting, New Orleans, LA, March 2003.
- “Electrochemistry at Electrodes of Nanometer Dimensions,” NSF-EC Nanomaterials Workshop, Cambridge, MA, December, 2002”
- “Nano- and Micro-Scale Electrochemical Approaches to Energy Storage and Corrosion,” Workshop on Energy and Transportation, Challenges for the Chemical Sciences in the 21st Century, The National Academy of Sciences, Washington, DC, Jan. 8, 2002.” “Electrochemistry at Electrodes of Nanometer Dimensions,” NSF-EC Nanomaterials Workshop, Cambridge, MA, December, 2002”
- “Electrochemistry in Magnetic Fields,” Electrochemical Society National Meeting, Salt Lake City, October, 2002.
- “Nanoscale Conductivity Mapping of the Oxide Film on Titanium using Conductivity Atomic Force Microscopy,” ACS South Regional Meeting, Austin, TX November 4, 2002.
- “Electrochemistry at Electrodes of Nanometer Dimensions,” University of Texas at Austin, October 31, 2002.
- “Electrochemistry in Magnetic Fields” Faraday Medal (RSC) Presentation, Electrochemistry 2002, Preston, UK, Sept. 1, 2002.
- “Electrochemical Imaging of Iontophoretic Transport Across Skin,” National School of Chemistry and Physics of Bordeaux, Pessac, France, May 29, 2002.
- “Electrochemically-Active Defect Structure at the Metal/Metal Oxide Interface,” Faraday Discussion 121, Fritz-Haber Institute, Berlin, Germany, April, 15-17, 2002.
- “Electronic Defect Structures in Oxide Films on Al, Ti, and Ta,” 2002 NACE International, Denver, CO, April 7 –12, 2002.
- “Transdermal Drug Delivery using Electrochemistry: Imaging Pathways and Understanding the Mechanism of Iontophoresis in Skin” at University of Missouri at Rolla, Rolla, MO, April 1, 2002.

- "Three Dimensional Battery Architectures," University of Utah, College of Science's *Science at Breakfast* Series, March 27, 2002.
- "Electrochemical Kinetics and Transport in Nanoscale Domains. Towards a 3-D Nanoscale Battery" Eveready/Energizer, Cleveland, OH, March 13, 2002.
- "Electrochemistry in Magnetic Field Gradients," PittCon,, New Orleans, LA, March 20, 2002.
- "Magnetic- and Nano-electrochemical Phenomena" Potter's Lodge Workshop on Electrochemistry, Blue Mt. Lake, NY, Sept. 5, 2001.
- "Electrochemical Imaging of Iontophoretic Transport Across Skin," Tufts University (Sponsored jointly by Tufts Chemistry and The New England Section of the Electrochemical Society), Sept 4., 2001.
- "Research Frontiers in Chemistry" Lecture Series, U. Iowa, September, 2001.
- "Molecular Transport Across Skin"
- "Magnetic Field Effects in Electrochemistry"
- "Electrochemistry in Nanoscale Domains"
- "Magnetic Field Effects at Microelectrodes," (Keynote lecture), Connamara, Glaway Ireland, May, 20, 2001.
- "Molecular Transport in Skin," U. Florida, Gainesville, FL, April 25, 2001.
- "Electrochemistry at Electrodes of Submicron Dimensions," U. Michigan, April 19, 2001.
- "Electrochemical Imaging of the Electronic Properties of Oxide Films," PittCon,, New Orleans, LA, March 5, 2001.
- "Imaging Molecular Transport Across Human Skin," ECS Nat'l Meeting, Washington D. C., March 26, 2001.
- "Electrochemistry at Electrodes of Submicron Dimensions," U. Virginia, Charlottesville, VA, Nov. 30, 2000.
- "Visualization and analysis of iontophoretic transport in hairless mouse skin," International Conf. on Colloid and Surface Science, Tokyo, Japan, Nov. 8, 2000.
- J. J. Watkins, B. D. Cope, J. L. Conyers, H. S. White, *Transport Phenomena at Nanoscale Dimensions*," Workshop on Interfaces, Phenomena, and Nanostructures in Lithium Batteries, Argonne, IL, Dec. 13, 2000.
- *Scanning Electrochemical Microscopy Investigations of Aluminum Oxide Films*; May 15, 2000. 197th Meeting of the Electrochemical Society, Toronto, Canada.
- *Scanning Electrochemical Microscopy of Electron-Transfer Activity at Thin Oxide Films*. May 25, 2000, Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID.
- *Scanning Electrochemical Microscopy of Electron-Transfer Activity at Thin Oxide Films*. April 25, 2000. 2000 Spring Meeting of Materials Research Society, San Francisco, CA.
- "Magnetic Field Focusing and Confinement of Electrochemically Generated Reactants. Solution-Phase Ion Beams, Cyclotrons and Traps," Reilley Award Address, PittCon 2000, New Orleans, LA, March 14, 2000.
- "Iontophoretic Transport in Biological and Synthetic Membranes," Gordon Research Conference on Electrochemistry, Ventura, CA., Jan. 16, 2000.
- "Imaging Molecular Transport Across Skin," 197th Meeting of the Electrochemical Society, Toronto, Canada, May 17, 2000.
- "Iontophoretic Transport in Biological and Synthetic Membranes," 198th Meeting of the Electrochemical Society, Phoenix, AZ, Oct. 22-27, 2000.
- "Electrochemistry at Nanostructured Materials: The Scaling of Molecular Transport in Small Domains," ONR/AFSOF Workshop, Washington D.C., Feb. 14, 2000.
- "Magnetic Field Focusing and Confinement of Electrochemically Generated Reactant. Solution-Phase Ion Beams, Cyclotrons, and Traps," Colorado State University, Fort Collins, CO, Oct. 13, 1999.
- "Magnetic Field Focusing and Confinement of Electrochemically Generated Reactant. Solution-Phase Ion Beams, Cyclotrons, and Traps," Michigan State University, East Lansing, MI, Nov. 18, 1999.
- "Scanning Electrochemical Imaging of Oxide Films on Ti," DOE/BES workshop, University of Illinois, Champaign/Urbana, IL, Sept. 17, 1999.
- "Magnetic Field Focusing and Confinement of Electrochemically Generated Reactant. Solution-Phase Ion Beams, Cyclotrons, and Traps," Lehigh University, Bethlehem, PA, Sept. 22, 1999.

- S. B. Basame and H. S. White, "Scanning Electrochemical Microscopy of Electron Transfer Reactions at Thin Films of TiO_2 and Ta_2O_5 ," in Symposium on *New Electroanalytical Methods*, National Meeting of the Electrochemical Society, Seattle, WA, May, 1999.
- K. M. Grant, J. W. Hemmert, and H. S. White, "Ion Focusing in a Magnetic Field. The Electrochemical Vortex and Ion Beam," in Symposium on *New Electroanalytical Methods*, National Meeting of the Electrochemical Society, Seattle, WA, May, 1999.
- "The Electrical Potential Distribution Across Molecular Monolayers on Electrodes," University of Leicester, Leicester, U.K., May 21, 1999.
- "Magnetic Field Effects at Ultramicroelectrodes. Solution-Phase Cyclotrons and Ion Beams," Oxford University, Oxford, U.K., May 20, 1999.
- Albright & Wilson Lectures, University of Warwick, Coventry, U.K., May 17 – 19, 1999.
- "Iontophoresis in Skin. Visualization and analysis of Electroosmotic Flows using the Scanning Electrochemical Microscope,"
- "Magnetic Field Effects at Ultramicroelectrodes. Solution-Phase Cyclotrons and Ion Beams,"
- "The Electrical Potential Distribution Across Molecular Monolayers on Electrodes,"
- "Visualization and Analysis of Iontophoretic Transport in Skin," University of Arizona, Feb. 24, 1999.
- "Directing Current with Magnetic and Electric Fields," DARPA/DSRC Workshop, Washington DC, Dec. 9 1998.
- "Electrochemically generated Magnetic Forces -- Charge and Spin Driven Enhanced Transport," University of Washington, Seattle, Nov. 1998.
- "Electrochemically generated Magnetic Forces -- Charge and Spin Driven Enhanced Transport," Southern Illinois University, Carbondale, October 1998.
- "Scanning Electrochemical Microscopy of Oxide Films: Chemically-Selective and Spatially Localized Redox Activity on Tantalum Oxide," DOE Meeting on Corrosion, Albuquerque, NM, Sept. 19, 1998.
- "Isotope substitution study of the Electrochemical formation of Sulfur Monolayers at Ag(III) ," presented at the *Frontiers in Electrochemistry Awards Symposium* honoring Stephen Feldberg, 216th National Meeting of the ACS, Boston, August 1998.
- "Electrochemically generated Magnetic Forces -- Charge and Spin Driven Enhanced Transport," Naval Research Laboratory, Washington, D.C., August 1998.
- "Magnetic Field Effects at Ultramicroelectrodes: Voltammetric Behavior in Large and Non-Uniform Fields" 193rd Meeting of the Electrochemical Society, San Diego, May 6, 1998.
- "Imaging Electroosmotic Flow in Porous Membranes" 193rd Meeting of the Electrochemical Society, San Diego, May 4, 1998.
- "Ultramicroelectrodes: Applications in Scanning Electrochemical Microscopy" Texas Tech University, April 20, 1998.
- "Imaging Electroosmotic Flow Across Skin "Texas Tech University, University, April 22, 1998.
- "Adsorption Free Energies of n-Alkanethiolates on Metal Surfaces," Texas A & M University, March 27, 1998.
- "Imaging Electroosmotic Flow Across Synthetic and Biological Membranes" National Meeting of the ACS, Dallas, TX, April 2, 1998.
- "Adsorption of Hydrosulfide on Ag(111) . Isotope Effects," National Meeting of the ACS, Dallas, TX, April 2, 1998.
- "Adsorption Free Energies of n-Alkanethiolates on Metal Surfaces," California State University, Nov. 18, 1997.
- "Isotope Effects on a Surface Electrochemical Reaction," Electrochemistry Gordon Conference, Ventura, Ca, January, 1998 (short talk).
- "Electrochemical Measurement of the Adsorption Thermodynamics of Alkanethiolate Monolayers," LB8 Conference on Organized Molecular Films, Asilomar, CA, Aug. 25, 1997.
- "Electrochemical-Engendered Flow in Electric and Magnetic Fields" - ONR Workshop, Atlanta, April 3, 1997.
- "Adsorption Free Energies of n-Alkanethiolates on Metal Surfaces," California State University, Nov. 18, 1997.
- "Adsorption Free Energies of n-Alkanethiolates on Metal Surfaces," University of Illinois, Urbana, Oct. 3, 1997.

- "Measurable Influences of the Interfacial Electrical Double Layer on Electron-Transfer Reactions at Microelectrodes and Redox-Active Monolayers," University of California, Irvine, April 29, 1997.
- "Electrochemical Measurement of The Thermodynamic Stability of Alkanethiolate Monolayers," Auburn University, April 27, 1997.
- "Electrochemical Measurement of The Thermodynamic Stability of Alkanethiolate Monolayers," University of California, Davis, April 17, 1997.
- "Electrochemical-Engendered Flow in Electric and Magnetic Fields" - ONR Workshop, Atlanta, April 3, 1997.
- "Magnetic Field Control of Interfacial Potential and Current at Microelectrodes: Applications in Fundamental Studies of Transport Phenomena and Solution Phase Focusing and Trapping," Pittsburgh Conference, Atlanta, GA, March, 1997.
- "Reevaluation of the Accessible Experimental Time Window for Electrochemical Methods Using Microelectrodes," Pittsburgh Conference, Atlanta, GA, March, 1997.
- "Theory and Measurements of Double Layer Effects at Self-Assembled Monolayers," 191st Meeting of the Electrochemical Society, Montreal, May, 1997.
- "Electrochemistry in Concentrated Organic Redox Solutions. Unusual Reaction Mechanisms and Transport Phenomena," 191st Meeting of the Electrochemical Society, Montreal, May, 1997.
- "Electrochemical Measurement of The Thermodynamic Stability of Alkanethiolate Monolayers on Ag(111) and Au(111)," Vanderbilt University, Feb. 24, 1997.
- "Scanned Probe Analysis of Electroosmotic Transport in Ion-Selective Membranes," ARPA Contractors Meeting, Wash. D.C. Oct., 1996.
- "Imaging Molecular Transport in Skin using Scanning Electrochemical Microscopy," Gallaxo-Wellcome, Inc., Nov. 5, 1996.
- "Magnetic Field Control of the Interfacial Potential Distribution and Voltammetric Currents Using Microelectrodes," University of North Carolina, Chapel Hill, Nov. 4, 1996.
- "Reevaluation of the Accessible Timewindow in Electrochemical Measurements," Potter's Lodge Workshop on Electrochemistry, Blue Mt. Lake, NY, Sept. 4, 1996.
- "Magnetic Field Control of the Interfacial Potential Distribution and Voltammetric Currents Using Microelectrodes," ACS Rocky Mountain Conference, Denver, July 7, 1996.
- "Imaging Molecular Transport in Skin using Scanning Electrochemical Microscopy," ACS Great Lakes Regional Meeting, Illinois State University, May 21, 1996.
- "Electrochemistry Without Solvent or Ions," University of Minnesota, May 30, 1996.
- "Direct Imaging of Molecular Transport in Skin and Synthetic Porous Membranes," ALZA, Inc., Palo Alto, CA, 1996.
- "Electrochemistry in Highly Concentrated Organic Redox Solutions," Duke University, Feb. 1996.
- "Electrochemistry in Highly Concentrated Organic Redox Solutions," N.C. State University, Feb. 1996.
- "Experiments in Photoluminescence, Chemiluminescence, and Electrogenated Chemiluminescence," Science and You Seminars, University of Utah, Nov. 1995.
- "STM and Scanning Tunneling Spectroscopy of Ag Halide Monolayers," Brigham Young University, Oct. 1995.
- "Electrochemistry and STM of Molecular and Atomic Adsorbates," Colorado Springs, Feb. 1995
- "Redox-Charge-Induced Surface Potential Transients," Office of Naval Research Contractors Meeting, University of California at Los Angeles, Jan. 1995.
- "Redox-Charge-Induced Surface Potential Transients," ACS Colloid and Surface Science Symposium, Salt Lake City, UT, June 1995.
- "Theory of Electric-Field Induced Surface Conformational Transitions: Applications to Interfacial Structure, Ion Adsorption, and Biological Membranes," Joint Northwest and Rocky Mountain Regional ACS Meeting, Park City, UT, June 1995.
- "Scanning Electrochemical Microscopy of Electroactive Sites on Thin TiO₂ Films," Annual Meeting of the National Association of Corrosion Engineers, Houston, TX, Mar. 1995.
- "Electrochemistry in Concentrated Organic Redox Solutions Using Microelectrodes," Pittsburgh Conference, Chicago, March 1995.
- "Scanning Electrochemical Microscopy of Precursor Sites for Pitting Corrosion on Ti," *Gordon Research Conference on Corrosion*, New Hampshire, August 1994.

- "Electrochemistry of Organic Redox Liquids," 45th Meeting of the International Electrochemistry, Porto, Portugal, August 1994.
- "Electrochemistry of Highly Concentrated Organic Redox Solutions," Annual Meeting of the Federation of Analytical Chemists and Spectroscopy Society, St. Louis, MO, Oct. 1994.
- "Concentrated Organic Redox Solutions," Utah State University Nov. 1994.
- "Concentrated Organic Redox Solutions," Brigham Young University, Nov. 1994.
- "STM and Tunneling Spectroscopy of Halogen Adlayers on Ag(111)," Polaroid, Boston, MA., July 1994.
- "STM and Tunneling Spectroscopy of Halogen Adlayers on Ag(111)," Cornell University, April 1994.
- "Scanning Electrochemical Microscopy of Iontophoretic Fluxes Through Mammalian Skin," University of Texas, March 1994.
- "Scanning Electrochemical Microscopy of Iontophoretic Fluxes Through Mammalian Skin," Texas A & M University, March 1994.
- "STM and Tunneling Spectroscopy of Halogen Adlayers on Ag(111)," Naval Research Laboratories, Washington D.C., Sept. 1993.
- "Structural Investigations of Halogen Coated Ag(111) Surfaces," Pittsburgh Conference 1994, Chicago, IL April 1994.
- "Scanning Electrochemical Microscopy of Ti Electrodes. Identification of Precursor Sites of Pitting," DOE Contractors Meeting, Colorado School of Mines, Sept. 1993.
- "Halogen Layers on Ag(111)," 206th ACS National Meeting, Chicago, IL, Aug. 1993.
- Quartz Crystal Microbalance Measurements of Variations in Depletion Layer Properties During Cyclic Voltammetry," ECS National Meeting New Orleans, Oct. 1993.
- "Effect of the Electrical Double Layer on Chronoamperometric and Voltammetric Measurements Using Microelectrodes," ECS National Meeting, New Orleans, Oct. 1993.
- "Scanning Electrochemical Microscopy of Iontophoretic Fluxes Through Mammalian Skin" ECS National Meeting, New Orleans, Oct. 1993
- "Scanning Electrochemical Microscopy of Skin: Quantitative Measurements of Iontophoretic Fluxes," Becton Dickinson Research Center, Research Triangle Park, NC, Feb. 5, 1993.
- "Halogen Adlayers on Silver (111)," Pittsburgh Conference, Chicago, March 1993.
- "Electric-Field Assisted Interfacial Chemistry," Center for Interfacial Biopolymers, University of Utah, October 1992.
- "Scanning Tunneling Microscopy and Atomic Force Microscopy of Electroactive Films," *Gordon Research Conference on Electrochemistry*, Ventura, CA, January 1992.
- "Scanning Tunneling Microscopy of Electroactive Molecular Films," University of Puerto Rico, November 1992.
- "Tip-Induced Surface Phase Transitions," National Meeting of the Electrochemical Soc., Toronto, October 1992.
- "Theory of the Interfacial Potential Distribution of Electrodes Coated with Electroactive Adsorbates," National Meeting of the Electrochemical Soc., Toronto, October 1992.
- "Simulations of Solvent Effects on Confined Electrolytes," National Meeting of the Electrochemical Soc., Toronto, October 1992.
- "Electronic and Structural Properties of Electroactive Molecular Films," Penn State University, Department of Chemistry, April 1992.
- "Tunneling Spectroscopy of TiO₂ Films," Annual Meeting of the National Association of Corrosion Engineers, Nashville, TN, April 1992
- "An STM Investigation of the Molecular and Electronic Structure of Electroactive Films," Eastman Kodak Company, Rochester, NY, March 1992.
- "Electrochemistry of Concentrated Solutions," University of New Mexico, Department of Chemistry, March 1992.
- "Scanning Tunneling Microscopy of Electroactive Molecular Films," Sandia National Laboratories, March 1992.
- "Scanning Tunneling Microscopy of Electroactive Molecular Films," University of Iowa, Department of Chemistry, March 1992.
- "Electronic and Structural Properties of Electroactive Molecular Films," University of Utah, Department of Chemistry, January 1992.

- "Electrochemistry of Concentrated Solutions," University of Utah, Department of Chemistry, January 1992.
- "Scanning Electrochemical Microscopy of Stratum Corneum," ALZA Corp., CA. January 1992.
- "Scanning Tunneling Microscopy of Electroactive Molecules," Brookhaven National Laboratories, November 1991.
- "Experimental and Theoretical Comparison of Electron Tunneling in STM and Electrochemical Environments," National AIChE Meeting, November 1991, Los Angeles.
- "Fabrication of Multilayer Nanostructures Using the STM," National AIChE Meeting, November 1991, Los Angeles.
- "Applications of Phase-Measurement Interference Microscopy in Engineering," B. P. Research, Cleveland, OH, November 1992.
- "Applications of Phase-Measurement Interference Microscopy in Engineering," Minnesota Society of Optical Microscopy, St. Paul, April 1991.
- "Near-Field Microscopies of Inorganic and Biological Materials," Ecolab, Inc., Minneapolis, April 1991.
- "Effect of Surface Electric Fields on Heterogeneous Electron-Transfer and Coupled Homogeneous Reactions," National ACS Mtg., Atlanta, April 1991.
- "Nucleation and Growth of Polymer Films," Pittsburgh Conference, Chicago, March 1991.
- "Scanning Electrochemical Microscopy," Unilever, Inc., NJ, January 1990.
- "Scale Up of Electroorganic Reactions," Minnesota Chapter of AIChE, January 1991.
- "Scanning Tunneling Microscopy and Tunneling Spectroscopy of an Electroactive Molecule," Gordon Research Conference on Electrochemistry, Ventura, CA., January 1991.
- "Scanning Ion Conductance Microscopy," ACS Regional Mtg., New Orleans, December 1990.
- "Scanning Tunneling Microscopy of Adsorbed Organometallic Complexes," ACS Regional Mtg., New Orleans, December 1990.
- "Scanning Tunneling Microscopy of Electroactive Substrates," ECS National Mtg., Seattle, Oct. 1990.
- "Scanning Tunneling Microscopy of Adsorbed and Polymerized Redox Molecules," Electrochemical Society National Meeting, Montreal, May 1990.
- "High Resolution In-Situ Characterization of Reactive Surfaces Using Phase-Detection Interferometric Microscopy," AIChE Meeting, San Francisco, November 1989.
- "Electrochemistry at Nanoscopic Electrodes," ONR/NRL workshop on "Research Opportunities at the Solid/Liquid Interface," Washington, DC, November 1989.
- "Refractive Index Mapping of Current Distribution on Heterogeneous Surfaces," Electrochemical Society National Meeting, Hollywood, FL, October 1989.
- "Phase-Detection Interference Microscopy of Electrode Surfaces," Electrochemical Society National Meeting, Hollywood, FL, October 1989.
- "Surface Force Measurements at Metal Electrodes," Electrochemical Society National Meeting, Hollywood, FL, October 1989.
- "In-Situ Probes of Electrode Surfaces," Electrochemical Society National Meeting, Los Angeles, May 1989.
- "In-Situ Phase Detection Interferometric Microscopy," Electrochemical Society National Meeting, Los Angeles, May 1989.
- "Nanoscope Electrodes," 22nd Great Lakes Regional ACS Meeting, Duluth, MN, May 1989.
- "Transport to Nanoscopic Electrodes and Dispersed Catalysts," ONR/DARPA/SDI Power Sources Meeting, SRI International, Menlo Park, CA, March 1989.
- "Phase Detection Microscopy of Electrodes and Electrochemical Processes," University of Alberta at Edmonton, Dept. of Chemistry, April 1989.
- "Surface Forces and Dynamics at the Electrode/Electrolyte Interface," Indiana University, Dept. of Chemistry, March 1989.
- "In-Situ Phase-Detection Microscopy of Electrode Surfaces," University of Illinois, Dept. of Chemical Engineering, February 1989.
- "Surface Forces and Dynamics at Electrode Interfaces," University of California at Berkeley, Dept. of Chemistry, January 1989.
- "Phase Detection Microscopy of Electrode Surfaces," *Gordon Research Conference on Electrochemistry*, Ventura, CA, January 1989.

- "Surface Forces and Dynamics at Electrode/Electrolyte Interfaces," *Gordon Research Conference on Water and Aqueous Chemistry*, Plymouth, New Hampshire, August 1988.
- "Surface Forces and Dynamics at Electrode/Electrolyte Interface," *Gordon Research Conference on Physical Electrochemistry*, New London, New Hampshire, August 1988.
- "Microelectrode Sensors," Pittsburgh Conference on Analytical Chemistry, New Orleans, February 1988.
- Co-Chair of Physical Electrochemistry Division Symposium on "Tunneling Microscopy and Electrochemistry at the Atomic Scale," National Electrochemical Society Meeting, Chicago, 1988.
- "Surface Forces and Dynamics Investigated Using Electrodes and Electrochemical Cells of Molecular Dimensions," 7th Australian Electrochemistry Conference, Sydney, Australia, February 1988.
- "In-Situ Phase Detection Microscopy of Electrodes," National Electrochemical Society Meeting, Chicago, October 1988.
- "Redox Liquid Electrochemistry," American Chemical Society National Meeting, Los Angeles, September 1988.
- "Surface Forces and Dynamics Investigated Using Electrodes and Electrochemical Cells of Molecular Dimensions," University of Texas, Department of Chemistry, December 1987.
- "Surface Forces and Dynamics Investigated Using Electrodes and Electrochemical Cells of Molecular Dimensions," Texas A&M University, Department of Chemistry, December 1987.
- "Voltammetric Studies in Concentrated Organic Solutions Using Microelectrodes," AIChE 1987 Fall Meeting, Miami, November 1987.
- "Surface Forces and Dynamics Investigated Using Electrodes and Electrochemical Cells of Molecular Dimensions," Electrochemical Society Fall Meeting, Hawaii, October 1987.
- "Fabrication and Properties of Microelectrochemical Devices Derived From Electroactive Polymers," Short Course on Electroactive Polymers, SUNY at New Platz, N. Y., October 1987.
- "Surface Forces at the Metal/Electrolyte Interface," National Bureau of Standards, Gaithersburg, MD, September 1987.
- "Microstructured Electrodes for Chemical Analysis," Dow Chemicals, Midland, MI, June 1987.
- "Corrosion Principles in Microelectronics," ASM Conference on Electronic Packaging and Corrosion in Microelectronics, Minneapolis, MN, April 1987.
- "Solid-State Polymer Photovoltaic Cells," National ACS Meeting, Denver, April 1987.
- "Behavior of Pt Band Electrodes of Molecular Dimension," *Gordon Conference on Electrochemistry*, (open-session presentation) Santa Barbara, CA, January 1987.
- "Electrochemical Properties and Physical Interactions Between Platinized Mica Surfaces," *Gordon Research Conference on Chemistry of Interfaces*, June 1986.
- "Electrochemistry of Concentrated Organic Redox Solutions," International Electroanalytical Symposium, Cherry Hill, NJ, May 1986.
- "Applications of the Surface Forces Microbalance For Studying Electrode Reactions," AIChE 1986 Fall Meeting, Miami, FL, November 1986.
- "Electrochemical Properties and Physical Interactions Between Platinized Mica Surfaces," E.I. duPont de Nemours, Wilmington, DL, June 1986.
- "Electrochemical Studies of Concentrated Organic Redox Systems," Federation of Analytical and Spectroscopic Societies, St. Louis, MO, September 1986.
- "Surface Forces at the Metal/Electrolyte Interface," Federation of Analytical and Spectroscopic Societies, St. Louis, MO, September 1986.
- "Applications of the Surface Forces Apparatus in Electrochemistry," National Research Council Workshop on In-situ Characterization of Electrochemical Processes, Denver, CO, October 1985.
- "Optical and Electrical Properties of Poly(3-methylthiophene)," NSF Workshop on Chemically Modified Electrodes and Semiconductor Photoelectrochemistry, Santa Barbara, CA, September 1984.
- "Chemical Modifications of the Semiconductor Electrode/Electrolyte Interface," Department of Chemistry, Dartmouth College, Hanover, NH, January 1984.
- "Chemical Modifications of the Semiconductor Electrode/Electrolyte Interface," General Motors Research Laboratories, Warren, MI, January 1984.
- "Chemical Modifications of the Semiconductor Electrode/Electrolyte Interface," Department of Chemistry, Florida State University, Tallahassee, FL, December 1983.

- "Chemical Modifications of the Semiconductor Electrode/Electrolyte Interface," Department of Chemical Engineering and Materials Science, Minneapolis, MN, January 1984.
- "Charge-Transport Mechanisms in Nafion Polymer Modified Electrodes," Department of Chemistry, Michigan State University, East Lansing, MI, February 1983.
- "Charge-Transport Mechanisms in Nafion Polymer Modified Electrodes," Department of Chemistry, University of Hawaii, Honolulu, HI, January 1983
- "Charge-Transport Mechanisms in Nafion Polymer Modified Electrodes," Department of Chemistry, University of Wisconsin, Madison, WI, January 1983
- "Charge-Transport Mechanisms in Nafion Polymer Modified Electrodes," Department of Chemistry, University of Illinois, Urbana-Champaign, IL, December 1982.
- "Electrochemical Cells for Converting Sunlight," Renewable Energy Conference, Austin, TX, April 1982.
- "Biconductive Polymers Produced by Incorporation of Tetrathiofulvalenium in a Polyelectrolyte (Nafion) Matrix," Gordon Research Conference on Electrochemistry (open-session presentation), Ventura, CA, January 1981.