

July 1981 to June 1986 Associate Professor of Chemistry
July 1975 to June 1981 Assistant Professor of Chemistry
Department of Chemistry
Princeton University
Princeton, NJ 08544-1009

Jan. 1975 to June 1975 Postdoctoral Research Associate
Lawrence Berkeley Laboratory
University of California
Berkeley, CA 94720

Oct. 1971 to Jan. 1975 NSF Fellow and Graduate Research Assistant
Department of Chemistry
University of California
Berkeley, CA 94720

May 1971 to Sept. 1971 Research Chemist
May 1970 to Sept. 1970 Radiochemistry Department
Lawrence Livermore Laboratory
Livermore, CA 94550

Honors and Awards

- Putnam Scholar, Kansas State University, 1967-1971
- H.H. King Chemistry Scholarship, Kansas State University, 1967-1971
- *Phi Eta Sigma*
- *Phi Kappa Phi*
- National Science Foundation Graduate Fellow, 1971-1975
- Woodrow Wilson Fellowship Finalist, 1971
- DuPont Young Faculty Grant, 1977
- ACS-Exxon Award in Solid State Chemistry, 1981
- Alexander von Humboldt Foundation Research Fellow, 1985-1986, 1990, 2007
- Fellow of the American Association for the Advancement of Science, 1994
- Visiting Fellow, JILA, University of Colorado, 1999
- Distinguished Visiting Professor, National University of Singapore, 1998, 2000, 2003, 2007, 2010, 2011, 2012, 2014
- Moses Gomberg Lecturer, University of Michigan, 2001
- Fellow of the American Vacuum Society, 2001
- ACS Arthur W. Adamson Award for Distinguished Service in the Advancement of Surface Chemistry, 2006
- ACS Petroleum Research Fund Advisory Board, 2009-2015
- KOSMOS Fellow, Humboldt University-Berlin, 2014-2015

Professional Societies

- *Sigma Xi*
- *Phi Lambda Upsilon* Chemistry Society
- American Chemical Society
- American Association for the Advancement of Science
- American Physical Society
- American Vacuum Society

Department, University and Service to the Discipline

Director of Graduate Studies, Chemistry, 1982-1985, 1993-1996, 2008-2011.
Senior Faculty Recruiting and Long Range Planning Committee, Chemistry, 2005-2010
Graduate Work Committee, Chemistry, 1993 to present

Executive Committee of Princeton Materials Institute, 1994-1996.
Executive Committee of Plasma Science Program, 2005-present
Executive Committee of Environmental Studies Program, 2001-present

University Committee on Conference and Faculty Appeal, 1977-1980, 1998-2001, 2003, 2004
Council of the Princeton University Community, 1986-1989
University Research Board, 2004-2008, 2009
University Committee on Examinations and Standing, 2006-2009, 2010-2011

University Committee on Occupational Health and Safety, 1990-1992
University Committee on Environment, Safety, and Risk Management, 2004-present

Freshman/Sophomore Academic Advisor, 1976-1981, 1982-present
Fellow of Rockefeller Residential College, 1982-present

Affiliated Faculty of Princeton Environmental Institute
Affiliated Faculty of Princeton Institute for the Science and Technology of Materials
E-affiliates Advisory Committee, faculty member, Andlinger Center, 2013

Panelist for Physical Sciences, European Research Commission, 2009 to present
Laboratories of Excellence Jury, ANR (French National Science Foundation), 2010-2011
Centers of Excellence Review Panel, Deutsche Forschungsgemeinschaft, 2011-2012
Severo Ochoa review panel, Spanish Ministry of Science, 2011
Site visit reviewer, Brookhaven National Laboratory, Pacific Northwest National Laboratory, Oak Ridge National Laboratory, Materials Research Laboratories-University of Illinois, Cornell University.
Reviewer for DOE, NSF, AFOSR, ARO, ONR funding agencies.
Reviewer for Physical Review, Science, Journal of the American Chemical Society, Langmuir, Journal of Physical Chemistry, Journal of Chemical Physics, Applied Physics Letters, Journal of Applied Physics, Journal of the Electrochemical Society, Surface Science, Chemical Reviews, Accounts of Chemical Research.

PUBLICATIONS

1. S.L. Bernasek and R. Graham Cooks, "The β -cleavage Reaction in Ethers", *Organic Mass Spectrometry* **3**, 127 (1970).
2. R. Graham Cooks and S.L. Bernasek, "Carbon Scrambling Upon Electron Impact", *J. Am. Chem. Soc.* **92**, 2129 (1970).
3. S.L. Bernasek, W.J. Siekhaus and G.A. Somorjai, "Molecular Beam Study of Hydrogen-Deuterium Exchange on Low and High Miller Index Platinum Single Crystal Surfaces", *Phys. Rev. Lett.* **30**, 1202 (1973).
4. S.L. Bernasek and G. A. Somorjai, "Molecular Beam Scattering from Clean and Carbon Monoxide Covered Platinum(111) Crystal Surfaces", *J. Chem. Phys.* **60**, 4552 (1974).
5. S.L. Bernasek and G. A. Somorjai, "Molecular Beam Scattering from Solid Surfaces", *Progress in Surface Science* **Vol. 5, Part 4**, (1975), p. 377.
6. R.P. Merrill, S.L. Bernasek and G. A. Somorjai, "Scattering of Helium and Deuterium from Single-Crystal Pt(111) Compared from Two Different Laboratories", *J. Vac. Sci. Technol.* **12**, 655 (1975).
7. S.L. Bernasek and G. A. Somorjai, "Small Molecule Reactions on Stepped Single Crystal Platinum Surfaces", *Surface Sci.* **48**, 204 (1975).
8. S.L. Bernasek and G. A. Somorjai, "Molecular Beam Study of the Mechanism of Catalyzed Hydrogen-Deuterium Exchange on Platinum Single Crystal Surfaces", *J. Chem. Phys.* **62**, 3149 (1975).
9. S.L. Bernasek, "Molecular Beam Scattering Studies of Energy Transfer and Chemical Reactions on Well Characterized Platinum Surfaces", Ph.D. Dissertation, University of California, Berkeley, 1975.
10. S.T. Ceyer, R.J. Gale, S.L. Bernasek and G. A. Somorjai, "Scattering of Thermal Helium Beams from High Miller Index (Stepped) Platinum Crystal Surfaces", *J. Chem. Phys.* **64**, 1934 (1976).
11. S.L. Bernasek, Book review, "Chemisorption and Magnetization", *J. Am. Chem. Soc.* **98**, 5731 (1976).
12. S.L. Bernasek and G.E. Staudt, "Chemisorption Induced Segregation of Impurities at Transition Metal Surfaces", *J. Catal.* **45**, 372 (1976).
13. T.N. Tommet and S.L. Bernasek, "Simple Two Axis Sample Manipulator", *Rev. Sci. Instrum.* **48**, 399 (1977).
14. J.W. Pyper, R.J. Dupzyk, R.D. Friesen, S.L. Bernasek, C.A. May, A.W. Echeveria and L.F. Tolman, "Hydrogen-Deuterium Exchange in Water Vapor: The Mass Spectrometer Sensitivities and the Equilibrium Constant", *Int. J. Mass Spect. and Ion Phys.* **23**, 209 (1977).

15. M.A. Langell and S.L. Bernasek, "LEED/Auger Observations of Cubic Sodium Tungsten Bronze Single Crystals", *Surface Sci.* **69**, 727 (1977).
16. M.A. Langell and S.L. Bernasek, "Transition Metal Compound Surfaces", chapter for Progress in Surface Science, **Vol. 9** (1979), p. 165.
17. T.N. Tommet, G.B. Olszewski, P.A. Chadwick and S.L. Bernasek, "Analysis of a Photographic-Vidicon Camera Method of LEED Beam Intensity Measurements", *Rev. Sci. Instrum.* **50**, 147 (1979).
18. P.A. Chadwick and S.L. Bernasek, "Computer Control and Data Acquisition in the Thermal Desorption Experiment", *Chemical, Biomedical, and Environmental Instrumentation* **9**, 227 (1979).
19. S.L. Bernasek, "Heterogeneous Reaction Dynamics", chapter for Advances in Chemical Physics, **Vol. 41**, (1980), p. 477.
20. M.A. Langell and S.L. Bernasek, "Transition Metal Compound Surfaces. 1. The Cubic Sodium Tungsten Bronze (Na_xWO_3) Surface", *J. Vac. Sci. Technol.* **17**, 1287 (1980).
21. M.A. Langell and S.L. Bernasek, "Transition Metal Compound Surfaces. 2. The Tungsten Trioxide, $\text{WO}_3(100)$ Surface", *J. Vac. Sci. Technol.* **17**, 1296 (1980).
22. R.P. Thorman, D. Anderson and S.L. Bernasek, "Internal Energy of Heterogeneous Reaction Products: Nitrogen Atom Recombination on Iron", *Phys. Rev. Lett.* **44**, 743 (1980).
23. C.W. Draper, S.P. Sharma, J.-L. Yeh and S.L. Bernasek, "Examination of Elemental Nonuniformities in Laser Surface Melted Ternary Copper Alloys", *Surf. and Interface Analysis* **2**, 179 (1980).
24. G.B. Olszewski and S.L. Bernasek, "Application of CMTA to LEED Analysis of the Clean Mo(001) Surface - Experimental and Structure Reliability Considerations", Proceedings of the IBM Conference on the Determination of Surface Structure by LEED, (P.M. Marcus and F. Jona, eds.) Plenum:New York (1980), p. 307.
25. G.B. Olszewski and S.L. Bernasek, "Theoretical Scattering Amplitudes for the Atomic Scattering of Low Energy Electrons for Use in Surface Crystallography by Low Energy Electron Diffraction", *J. Appl. Cryst.* **14**, 109 (1981).
26. M.A. Langell and S.L. Bernasek, "High Energy Electron Loss Spectroscopy of $\text{WO}_3(100)$ and $\text{Na}_x\text{WO}_3(100)$ Single Crystal Surfaces", *Phys. Rev.* **B23**, 1584 (1981).
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28. R.P. Thorman and S.L. Bernasek, "An Apparatus for the Direct Measurement of the Internal Energy of Heterogeneous Reaction Products", *Rev. Sci. Instrum.* **52**, 553 (1981).
29. R.P. Thorman and S.L. Bernasek, "The Internal Energy Distribution of Atom-Recombination Product N_2 Desorbing from Polycrystalline Iron", *J. Chem. Phys.* **74**, 6498 (1981).

30. C.J. Schramm, Jr., M.A. Langell and S.L. Bernasek, "Sodium Order/Disorder Transitions on the $\text{Na}_x\text{WO}_3(100)$ Surface", *Surface Sci.* **110**, 217 (1981).
31. S.L. Bernasek and S.R. Leone, "Direct Detection of Vibrational Excitation in the CO_2 Product of Oxidation of CO on a Platinum Surface", *Chem. Phys. Lett.* **84**, 401 (1981).
32. C.W. Draper and S.L. Bernasek, "Directed Energy Production of Novel Metallic Surfaces", Proceedings of the 13th Boulder Damage Symposium, November (1981).
33. S.L. Bernasek, "Studies of Structure and Dynamics in Heterogeneous Reactions", *Israel J. Chem.* **22**, 395 (1982).
34. G.B. Olszewski and S.L. Bernasek, "Sensitivity Analysis of Surface Structural Determinations by Low Energy Electron Diffraction", *J. Chem. Phys.* **79**, 3581 (1983).
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37. S.L. Miles, S.L. Bernasek, and J.L. Gland, "The Adsorption and Decomposition of Methanol on Mo(100): Effects of Surface Oxidation", *J. Phys. Chem.* **87**, 1626 (1983).
38. C.-S. Han and S.L. Bernasek, "Polygonal Fitting for Linearization", *Rev. Sci. Instrum.* **55**, 1510 (1984).
39. J. Levkoff, A. Robertson, Jr. and S.L. Bernasek, "Rotationally Inelastic Scattering of Nitrogen from Fe(111)", Proceedings of the 17th Jerusalem Symposium on Quantum Chemistry and Biochemistry, in Dynamics on Surfaces, (B. Pullman et al., eds.) Reidel:Amsterdam (1984) p. 243.
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43. D.-W. Moon, D.J. Dwyer and S.L. Bernasek, "Adsorption of CO on the Clean and Sulfur Modified Fe(100) Surface", *Surface Sci.* **163**, 215 (1985).
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50. B.M. Biwer and S.L. Bernasek, "Investigation of the Electronic Structure of an Iron-Titanium Nitride Ammonia Synthesis Catalyst", *Appl. Surf. Sci.* **25**, 41 (1986).
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53. P.B. Smith, S.L. Bernasek, J. Schwartz and G.A. McNulty, "Investigation of a Model Catalytic System in Ultrahigh Vacuum: The Adsorption of Tris(allyl)-rhodium on the TiO₂(001) Surface", *J. Am. Chem. Soc.* **108**, 5654 (1986).
54. R.J. Holland and S.L. Bernasek, "Thermal and Photochemical Promotion of Silicon Etching by Carbonyl Difluoride", *J. Appl. Phys.* **60**, 2553 (1986).
55. D.W. Moon, S. Cameron, F. Zaera, W. Eberhardt, R. Carr, S.L. Bernasek J.L. Gland and D.J. Dwyer, "A Tilted Precursor for CO Dissociation on the Fe(100) Surface", *Surface Sci. Lett.* **180**, L123 (1987).
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59. S.L. Bernasek, "State Resolved Dynamics of Chemical Reactions at Surfaces", *Chemical Reviews*, **87**, 91 (1987).
60. P.B. Smith and S.L. Bernasek, "The Adsorption of Water on TiO₂(001)", *Surface Sci.* **188**, 241 (1987).

61. K. Cannon, G.S. McNulty, P.B. Smith, S.L. Bernasek and J. Schwartz, "Attachment of Organorhodium Complexes to Metal Oxides: Chemical and Physical Characterization", *Chemically Modified Surf.* **2**, 175 (1987).
62. K. Lenz, B. Poelsema, S.L. Bernasek and G. Comsa, "Lateral Distribution of Coadsorbed H and CO on Pt(111) Studied by TEAS", *Surface Sci.* **189/190**, 431 (1987).
63. A.P. Norton, S.L. Bernasek and A.B. Bocarsly, "Mechanistic Aspects of the Photooxidation of Water at the n-TiO₂ Interface: Optically Induced Transients as a Kinetic Probe", *J. Phys. Chem.*, **92**, 6009 (1988).
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67. P.B. Smith, S.L. Bernasek and J. Schwartz, "The Interaction of Tris(allyl)rhodium with (001) Titanium Dioxide", *Surface Sci.* **204**, 374 (1988).
68. J.-P. Lu, M.R. Albert, S.L. Bernasek and D.J. Dwyer, "Adsorption State Conversion of CO on Fe(100)", *Surface Sci.* **199**, L406 (1988).
69. M.R. Albert, J.-P. Lu, S.L. Bernasek, S.D. Cameron, and J.L. Gland, "The Mechanism of the Decomposition of Methanethiol on Fe(100)", *Surface Sci.*, **206**, 348 (1988).
70. A.L. Helms, Jr., C.W. Draper, D.C. Jacobson, J.M. Poate and S.L. Bernasek, "Epitaxy and Defects in Laser Irradiated, Single Crystal Bismuth", *J. Mat. Res.*, **3**, 1097 (1988).
71. G.J. Orloff, S.L. Bernasek, G.L. Wolk, and R.J. Coyle, "Laser Assisted Etching of Lithium Niobate", *Materials Research Society Symposium Proceedings*, **126**, 251 (1988).
72. P.B. Smith and S.L. Bernasek, "Electron Loss Spectroscopy of Water Adsorption on Aluminum (111) and (100)", *J. Electron Spec.*, **49**, 149 (1989).
73. G.-Q. Xu, R.J. Holland, S.L. Bernasek and J.C. Tully, "Dynamics of Cluster Scattering from Surfaces", *J. Chem. Phys.*, **90**, 383 (1989).
74. T.C. Chang, J. Schwartz and S.L. Bernasek, "Thermal Evolution of an Oxide Bound Organometallic Complex in Ultra High Vacuum: Stepwise Conversion of Tris(allyl)rhodium to Rhodium Metal on TiO₂(001)", *J. Am. Chem. Soc.*, **111**, 758 (1989).
75. C.C. Cho and S.L. Bernasek, "Molybdenum Deposition from the Decomposition of Molybdenum Hexacarbonyl", *J. Appl. Phys.*, **65**, 3035 (1989).

76. J.-P. Lu, M.R. Albert, and S.L. Bernasek, "Adsorption and Dissociation of CO on Fe(100) at Low Coverage", *Surface Sci.*, **217**, 55 (1989).
77. J.-P. Lu, M.R. Albert, S.L. Bernasek and D.J. Dwyer, "The Adsorption of Oxygen on the Fe(100) Surface", *Surface Sci.*, **215**, 348 (1989).
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85. J.-P. Lu, M.R. Albert, and S.L. Bernasek, "The Decomposition of Surface Methoxy on Clean and Oxygen Post Dosed Fe(100): Control of Reaction Selectivity", *Catalysis Lett.*, **6**, 245 (1990).
86. S.L. Bernasek, J.-P. Lu, M.R. Albert, and W.H. Hung, "Small Molecule Reactions on the Clean and Modified Fe(100) Surface", in *Structure-Activity and Selectivity Relationships in Heterogeneous Catalysis*, R.K. Grasselli and A.W. Sleight, eds., Elsevier-North Holland, Amsterdam, 1991, p. 315.
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88. W.-H. Hung, J. Schwartz, and S.L. Bernasek, "Sequential Oxidation of Fe(100) by Water Adsorption: Formation of an Ordered Hydroxylated Surface", *Surface Sci.*, **248**, 332 (1991).
89. J.-P. Lu, M.R. Albert and S.L. Bernasek, "Sulfur Deposition on Fe(100) From Methanethiol Decomposition", *J. Vac. Sci. Technol. A*, **9**, 2788 (1991).

90. J.-P. Lu, M.R. Albert and S.L. Bernasek, "The Decomposition of Methanol on the Sulfur Modified Fe(100) Surface", *Surface Sci.*, **258**, 269 (1991).
91. P. Fenter, P. Eisenberger, J. Li, N. Camillone, III, S.L. Bernasek, G. Scoles, T.A. Ramanarayanan, and K.S. Liang, "The Structure of CH₃(CH₂)₁₇SH Self-Assembled on the Ag(111) Surface: An Incommensurate Monolayer", *Langmuir* **7**, 2013 (1991).
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93. W.-H. Hung, J. Schwartz and S.L. Bernasek, "Adsorption of H₂O on Oxidized Fe(100) Surfaces: Comparison Between the Oxidation of Iron by H₂O and O₂," *Surface Sci.*, **294**, 21 (1993).
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96. P. Jiang, M. Zappone, and S.L. Bernasek, "The Adsorption of H₂ on Fe(111) Studied by Thermal Energy Atom Scattering," *J. Chem. Phys.*, **99**, 8126 (1993).
97. S.L. Bernasek, "Reaction of Small Molecules at Well Characterized Iron Surfaces," invited review for *Annual Reviews of Physical Chemistry*, **44**, 265 (1993).
98. J.B. Miller, J. Schwartz and S.L. Bernasek, "The Importance of Ligand Kinetic Basicity on the Preparation of Surface-Supported Zirconium Complexes by Proton Transfer from Hydroxylated Aluminum or Silicon," *J. Am. Chem. Soc.*, **115**, 8239 (1993).
99. W.-H. Hung, J. Schwartz, and S.L. Bernasek, "Reaction Between Tetraallylmolybdenum and Hydroxylated Fe(100) in Ultrahigh Vacuum. A New Route to Characterizable Mixed Metal Oxide Catalyst Models," *Langmuir*, **10**, 2056 (1994).
100. J.B. Miller, S.L. Bernasek, and J. Schwartz, "Surface Hydroxylation of Single Crystal Aluminum (110) in Ultrahigh Vacuum", *Langmuir*, **10**, 2629 (1994).
101. L.C. Cheng, A.B. Bocarsly, S.L. Bernasek and T.A. Ramanarayanan, "The Interaction of Alkanethiols with Single Crystal Iron: The Low Temperature Decomposition of Ethanethiol on the Fe(100) Surface," *Langmuir*, **10**, 4542 (1994).
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105. S.L. Bernasek, "Molecular Beam Scattering: Reactive Scattering," in *The Handbook of Surface Imaging and Visualization*, A.T. Hubbard, ed., CRC Press, Boca Raton, 1995.
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34. Gordon Conference on Chemistry at Interfaces, Meriden, N.H., July 1980.
35. Franco-American Seminar on Heterogeneous Catalysis and Related Areas of Surface Chemical Physics, Paris, France, December 1980.
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52. Department of Chemistry, Columbia University, New York, October 1983.
53. Corporate Research Center, Phillips Petroleum Bartlesville, Oklahoma, November 1983.
54. Corporate Research Laboratories, Colgate-Palmolive, Piscataway, New Jersey, January 1984.
55. 30th Industrial Affiliates Symposium, Stanford University, Stanford, California, March 1984.
56. Molecular and Materials Research Division, Lawrence Berkeley Laboratory, Berkeley, California, March 1984.
57. 17th Jerusalem Symposium on Quantum Chemistry and Biochemistry: Dynamics of Molecule-Surface Interactions, Jerusalem, May 1984.
58. Institut für Grenzflächenforschung und Vakuumphysik, KFA Jülich, West Germany, May 1984.
59. Joint Institute for Laboratory Astrophysics, Boulder, Colorado, October 1984.
60. Department of Chemistry, Colorado State University, Fort Collins, October 1984.
61. Department of Chemistry, University of Nebraska, Lincoln, October 1984.
62. General Motors Research Laboratories, Warren, Michigan, October 1984.
63. Lasers '84 conference, San Francisco, November 1984.
64. National Meeting of American Institute of Chemical Engineers, San Francisco, November 1984.
65. Corporate Research Laboratory, Dow Chemical Company, Midland, Michigan, November 1984.
66. Surface Science Series, Rutgers University, New Brunswick, January 1985.

67. Department of Chemistry, Massachusetts Institute of Technology, April 1985.
68. BOC Group Corporate Laboratories, Murray Hill, NJ, July 1985.
69. Columbia Radiation laboratory, Columbia University, New York, October 1985.
70. W. R. Grace Corporate Research Laboratories, Columbia, Maryland, November 1985.
71. Exxon Research and Engineering, Clinton, New Jersey, November 1985.
72. Department of Chemistry, University of East Anglia, Norwich, England, May 1986.
73. Institut für Grenzflächenforschung und Vakuumphysik, Kernforschungsanlage Jülich, West Germany, May 1986.
74. Fritz Haber Institut der Max Planck Gesellschaft, Berlin, West Germany, June 1986.
75. Institut für Physikalische Chemie, Universität Hamburg, Hamburg, West Germany, July 1986.
76. Distinguished Alumni Lecturer, Department of Chemistry, Kansas State University, Manhattan, Kansas, October 1986.
77. Department of Chemistry, University of Pennsylvania, Philadelphia, November 1986.
78. IBM Thomas J. Watson Research Center, Yorktown Heights, New York, November 1986.
79. Department of Chemistry, Swarthmore College, Swarthmore, Pennsylvania, November 1986.
80. Department of Chemistry, Brookhaven National Laboratory, February 1987.
81. Institute for Physical Chemistry, Peking University, Beijing, China, June 1987.
82. Department of Chemical Engineering, National Tsing Hua University, Beijing, China, June 1987.
83. Distinguished Visiting Lecture Series, "Heterogeneous Reaction Dynamics", Department of Chemistry, Fudan University, Shanghai, China, June 1987.
84. Symposium on Structure and Dynamics at Surfaces, ACS National Meeting, New Orleans, September 1987.
85. AFOSR contractor's meeting, USAF Academy, Colorado Springs, Colorado, September 1987.
86. University of Cincinnati Surface Center Lecturer, University of Cincinnati, April 1988.
87. David Sarnoff Research Center - SRI, Princeton, July 1988.

88. Institut für Grenzflächenforschung und Vakuumphysik, KFA - Jülich, West Germany, July 1988.
89. Gordon Conference on Atomic and Molecular Interactions, August 1988.
90. Department of Physics, Kansas State University, October 1988.
91. Central Research, Texas Instruments, Dallas, April 1989.
92. IUVSTA Workshop on Structure and Reactivity of Small Molecules on Surfaces, Ofir, Portugal, September 1989.
93. Department of Chemistry, University of Texas, Austin, November 1989.
94. Department of Chemistry, Rice University, Houston, November 1989.
95. Department of Chemistry, Texas A&M University, College Station, November 1989.
96. Center for Advanced Materials, Lawrence Berkeley Laboratory, Berkeley, November 1989.
97. Institut für Grenzflächenforschung und Vakuumphysik, KFA-Jülich, West Germany, February 1990.
98. U.S. National Academy of Sciences, Workshop on Developments in Heterogeneous Catalysis, Beckman Center, Irvine, California, March 1990.
99. Fakultät für Physik, Universität Bielefeld, Bielefeld, West Germany, April 1990.
100. Automotive Emission Control Catalysis Research Group, Degussa AG, Hanau, West Germany, April 1990.
101. Symposium on "Structure-Activity Relationships in Heterogeneous Catalysis", ACS Meeting, Boston, April 1990.
102. Symposium on "Metal Clusters in Beams and on Supports: Chemistry and Catalysis", ACS Meeting, Boston, April 1990.
103. Research and Development Laboratory, Amoco Chemicals Company, Naperville, Illinois, June 1990.
104. Department of Chemistry, Columbia University, New York, September 1990
105. Laboratory for Surface Science and Technology, University of Maine, Orono, Maine, November 1990.
106. Symposium on Advanced Applications of Laser Spectroscopy, Department of Chemistry, Princeton University, December 1990.
107. Chemistry Division, National Science Foundation, Washington, DC, March 1991.
108. Conference on Molecule Surface Interaction, KFA-Jülich, Jülich, Germany, October 1991.

109. Laboratory for Surface Modification, Departments of Physics and Chemistry, Rutgers University, February 1992.
110. Department of Chemistry, Purdue University, West Lafayette, Indiana, March 1992.
111. Department of Chemistry, Notre Dame University, South Bend, Indiana, March 1992.
112. Department of Chemistry, Michigan State University, East Lansing, Michigan, March 1992.
113. Symposium on "Surface Chemistry and Catalysis," ACS Meeting, San Francisco, April 1992.
114. Department of Chemistry, San Jose State University, San Jose, California, April 1992.
115. Department of Chemistry, University of Maryland, College Park, Maryland, April 1992.
116. Department of Chemistry, James Madison University, Harrisonburg, Virginia, June 1992.
117. Department of Chemistry, Virginia Military Institute, Lexington Virginia, June 1992.
118. Department of Chemistry, University of Virginia, Charlottesville, Virginia, June 1992.
119. Department of Chemistry, Virginia Commonwealth University, Richmond, Virginia, June 1992.
120. Department of Chemistry, State University of New York, Stony Brook, New York, July 1992.
121. Department of Chemistry, Lehigh University, Bethlehem, Pennsylvania, August 1992.
122. Department of Chemistry, University of Vermont, Burlington, Vermont, August 1992.
123. Department of Chemistry and Laboratory for Surface Science and Technology, University of Maine, Orono, Maine, August 1992.
124. Department of Chemistry, Brown University, Providence, Rhode Island, August 1992.
125. Symposium on "Cluster/Surface Interactions: Surface Chemistry, Reaction Dynamics Through Materials Growth," ACS Meeting, Washington, DC, August 1992.
126. Department of Chemistry, Drexel University, Philadelphia, Pennsylvania, November 1992.
127. Peroxygen Chemicals Division, FMC Corporation Research Laboratories, Princeton, New Jersey, March 1993.
128. Department of Chemistry, University of Iowa, Iowa City, Iowa, April 1993.
129. Department of Chemistry, Northwestern University, Evanston, Illinois, May 1993.
130. Department of Chemistry, University of Illinois, Urbana, Illinois, May 1993.

131. 20th Anniversary Meeting of the Surface Reactivity and Catalysis Group of the Royal Society of Chemistry, University of Wales, Cardiff, Wales, July 1993.
132. Department of Chemistry, Ohio University, Athens, Ohio, March 1994.
133. Center for Materials Research and Analysis, University of Nebraska, Lincoln, Nebraska, April 1994.
134. Department of Chemistry, Colorado State University, Fort Collins, Colorado, April 1994.
135. Procter and Gamble Lecturer, Surface Science Center, University of Cincinnati, Cincinnati, Ohio, April 1994.
136. Physikalisch-Chemisches Institut, Ruprecht-Karls-Universität Heidelberg, Heidelberg, Germany, May 1994.
137. Institut Physik, Ruprecht-Karls-Universität Heidelberg, Heidelberg, Germany, May 1994.
138. Molecular Materials Research Division, Lawrence Berkeley Laboratory, University of California, Berkeley, California, November 1994.
139. Department of Chemistry, University of California-Riverside, Riverside, California, November 1994.
140. IUVSTA Workshop, "The Structure and Reactivity of Small Polyatomic Molecules on Surfaces", Brdo, Slovenia, April 1995.
141. European Science Foundation Workshop, "Surface Induced Dissociation", Amsterdam, The Netherlands, June 1995.
142. Department of Chemistry, University of North Texas, Denton, Texas, August 1995.
143. Department of Chemistry, University of Texas, Austin, Texas, August 1995.
144. Corporate Research and Development, Texas Instruments, Inc., Dallas, Texas, August 1995.
145. Annual Meeting of Federation of Analytical Chemistry and Spectroscopy Societies, Cincinnati, Ohio, October 1995.
146. Department of Chemistry, University of Wisconsin-Madison, April 1996.
147. Department of Chemistry, University of Minnesota, April 1996.
148. Department of Chemistry, Ames Laboratory, Iowa State University, April 1996.
149. Department of Chemistry, University of Wisconsin-Milwaukee, April 1996.
150. Solid State Chemistry '96, Bratislava, Slovak Republic, July 1996.
151. Department of General and Inorganic Chemistry, University of Pardubice, Pardubice, Czech Republic, July 1996.

152. Faculty of Applied Physics and Center for Materials Research, University of Twente, Enschede, The Netherlands, July 1996.
153. American Chemical Society National Meeting, Symposium on Electrochemical Surface Science, Orlando, Florida, August 1996.
154. Gordon Conference on Gas Phase Ions, Ventura, California, February 1997.
155. Department of Chemistry, University of Southern California, Los Angeles, California, February 1997.
156. Symposium to Honor the Memory of Brian Bent, ACS Meeting, San Francisco, California, April 1997.
157. Department of Chemistry, University of Missouri, Columbia, Missouri, April 1997.
158. Center for Advanced Materials, Lawrence Berkeley Laboratory, University of California, Berkeley, California, May 1997.
159. Department of Chemistry, University of Washington, Seattle, Washington, May 1997.
160. Symposium on Interfacial Structure, Kinetics and Electrocatalysis, 1997 Joint International Meeting of the Electrochemical Society and the International Society of Electrochemistry, Paris, September, 1997.
161. Institut für Grenzflächenforschung und Vakuumphysik der Forschungszentrum - Jülich, Germany, September, 1997.
162. Fiftieth Joint Meeting of the Czech and Slovak Chemistry Societies, Zlin, Czech Republic, September, 1997.
163. Seventeenth European Conference on Surface Science, Enschede, The Netherlands, September, 1997.
164. Chemical Physics Colloquium, University of Colorado, Boulder, January, 1998.
165. Department of Chemistry, Technion, Haifa, Israel, May, 1998.
166. Seventh International Symposium on Chemically Modified Surfaces, Northwestern University, Evanston, Illinois, June, 1998.
167. Award Symposium, Distinguished Service in the Advancement of Analytical Chemistry, ACS Meeting, Boston, August, 1998.
168. First Singapore Chemical Conference, Singapore, December, 1998.
169. Department of Chemistry, National University of Singapore, Singapore, December, 1998.
170. Faculty of Science, National University of Singapore, Singapore, January, 1999.

171. Synchrotron Radiation Research Center, Hsin-Chu Science Park, Hsin-Chu, Taiwan, January, 1999.
172. Institute for Atomic and Molecular Science, Academic Sinica, National Taiwan University, Taipei, Taiwan, January, 1999.
173. Laboratory for Surface Modification, Department of Physics and Astronomy, Rutgers University, New Brunswick, New Jersey, February, 1999.
174. Gordon Research Conference on Chemical Reactions at Surfaces, Ventura, California, March, 1999.
175. Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, Washington, March, 1999.
176. Department of Chemistry, Wayne State University, Detroit, April, 1999.
177. Department of Chemistry, Johns Hopkins University, Baltimore, October, 1999.
178. JILA, University of Colorado, Boulder, November, 1999.
179. Department of Chemistry, Tufts University, Boston, November, 1999.
180. Optical Sciences and Engineering Program, University of Colorado, Boulder, December, 1999.
181. Surface Science and Catalysis Seminar, Lawrence Berkeley National Laboratory, Berkeley, January, 2000.
182. Symposium to honor Gabor Somorjai, ACS National Meeting, San Francisco, March, 2000.
183. Department of Chemistry, National University of Singapore, Singapore, August, 2000.
184. Pauling Award Symposium, Western Washington University, Bellingham, Washington, October, 2000.
185. Symposium on Advances in Electronic Nose Research, San Diego, October, 2000.
186. Workshop on Academic Careers in Chemistry, Eastern Analytical Symposium, Atlantic City, New Jersey, October, 2000.
187. Symposium on Molecule-Metal Surface Interactions, San Juan, Puerto Rico, November, 2000.
188. Moses Gomberg Lecture, Department of Chemistry, University of Michigan, Ann Arbor, Michigan, January, 2001.
189. Department of Chemistry, Seton Hall University, South Orange, New Jersey, February, 2001.
190. Department of Chemistry, Drexel University, Philadelphia, Pennsylvania, April, 2001.

191. Workshop on Academic Careers in Chemistry, Eastern Analytical Symposium, Atlantic City, New Jersey, October, 2001.
192. Department of Physics and Applied Physics, Rensselaer Polytechnic Institute, Troy, New York, November, 2001.
193. Department of Chemistry, University of Massachusetts-Lowell, Lowell, Massachusetts, March, 2002.
194. Department of Physics, Kansas State University, Manhattan, Kansas, April, 2002.
195. Surface Analysis 2002, Vanderbilt University, May, 2002.
196. International Conference on Solid Films and Surfaces, Marseille, France, July, 2002.
197. Department of Chemistry, Virginia Commonwealth University, Richmond, Virginia, October, 2002.
198. Department of Chemistry, Texas A&M University, College Station, Texas, October, 2002.
199. Department of Chemistry, Pennsylvania State University, University Park, Pennsylvania, October, 2002.
200. Princeton Environmental Institute, Princeton University, Princeton, New Jersey, November, 2002.
201. Second International Conference on Elementary Processes in Molecule-Metal Surface Interactions, San Juan, Puerto Rico, May, 2003.
202. KAIST-Princeton Conference on Nano-materials, Jeju Island, Korea, June, 2003.
203. Gordon Research Conference on Dynamics at Surfaces, Andover, New Hampshire, August, 2003.
204. Department of Chemistry, University of Illinois at Urbana-Champaign, September, 2003.
205. Department of Chemical Engineering, University of Texas, Austin, Texas, September, 2003.
206. 204th Electrochemical Society National Meeting, Orlando, Florida, October, 2003.
207. Workshop on Academic Careers in Chemistry, Eastern Analytical Symposium, Somerset, New Jersey, November, 2003.

208. International Conference on Materials for Advanced Technologies, Singapore, December, 2003.
209. Department of Chemistry, National University of Singapore, Singapore, December, 2003.
210. Department of Chemistry, University of California, Berkeley, California, February, 2004.
211. Integrated Sciences Department, Claremont Colleges, Claremont, California, February, 2004.
212. Laboratory for Surface Modification, Rutgers University, Piscataway, New Jersey, April, 2004.
213. Department of Chemistry, Drexel University, Philadelphia, PA, May, 2004.
214. Physical Electronics Conference, UC Davis, Davis, California, June, 2004.
215. Princeton-Oxford Summer School on Advanced Materials Characterization, University of Oxford, Oxford, United Kingdom, July, 2004.
216. CRC Symposium on Catalytic Dynamics, Hokkaido University, Sapporo, Japan, October, 2004.
217. Gordon Research Conference on Reactions at Surfaces, Ventura, California, February, 2005.
218. Department of Chemistry, National University of Singapore, Singapore, February, 2005.
219. Faculty of Science, National University of Singapore, Singapore, March, 2005.
220. Second Annual University of California Symposium on Surface Science and its Applications, Berkeley, California, March, 2005.
221. Princeton University Local Science Education (PULSE), West Windsor Public Library, West Windsor, New Jersey, March, 2005.
222. Middle Atlantic Regional ACS Meeting, Rutgers University, May, 2005.
223. KAIST Nanomaterials Short Course, Korea Advanced Institute of Science and Technology, Daejon, Korea, October, 2005.
224. Eastern Analytical Symposium, Academic Careers in Chemistry Workshop, November, 2005.

225. Princeton University Local Science Education (PULSE), Trenton High School, Trenton, New Jersey, December, 2005.
226. New York Society of Cosmetic Chemists, Bridgewater, New Jersey, January, 2006.
227. KAIST-Chemistry International Symposium, Jeju Island, Korea, February, 2006.
228. ACS Awards Symposium, Adamson Award address, ACS National Meeting, Atlanta, March, 2006.
229. Kansas State-Wide EPSCoR Conference, University of Kansas, April, 2006.
230. Symposium on Dynamics of Single Atoms, Molecules, and Clusters on Surfaces, ACS National Meeting, San Francisco, California, September, 2006.
231. Surface Chemistry Symposium in Honor of Gabor Somorjai, ACS National Meeting, San Francisco, California, September, 2006.
232. AVS 53rd International Symposium, Organic Film Growth and Characterization, San Francisco, California, November, 2006.
233. Institute of Chemical and Engineering Sciences, ICES/A-STAR, Jurong Island, Singapore, April, 2007.
234. Chemistry Honours Symposium 2007, Department of Chemistry, National University of Singapore, Singapore, April, 2007.
235. Third Annual Meeting on Nanoscience and Nanotechnology, Bilkent University, Ankara, Turkey, June, 2007.
236. Department of Applied Physics, University of Twente, Enschede, The Netherlands, June, 2007.
237. Abteilung Chemische Physik, Fritz-Haber-Institut der Max Planck Gesellschaft, Berlin, July, 2007.
238. MURI-ONR Contractor's annual meeting, NIST, Boulder, Colorado, July, 2007.
239. Physical Chemistry Seminar, Brown University, Providence, Rhode Island, October, 2007.

240. MURI Progress Review, Department of Physics, University of California-Berkeley, November, 2007.
241. Laboratory for Surface Modification, Rutgers University, February, 2008.
242. Priestley Award Symposium, ACS National Meeting, New Orleans, April, 2008.
243. Adamson Award Symposium, ACS National Meeting, New Orleans, April, 2008.
244. VIII Turkish Chemical Physics Symposium, Istanbul Technical University, Istanbul, Turkey, April, 2008.
245. Fifth Annual University of California Symposium on Surface Science and its Applications, Santa Barbara, California, June, 2008.
246. Department of Chemistry, University of Kentucky, Lexington, Kentucky, September, 2008.
247. Spring Symposium, Catalysis Society of Metropolitan New York, Princeton, March, 2009.
248. Combustion Research Facility, Sandia National Laboratories, Livermore, California, June, 2009.
249. ECASIA 2009, Antalya, Turkey, October, 2009.
250. Eastern Analytical Symposium, Somerset, New Jersey, November, 2009.
251. Department of Chemistry, National University of Singapore, Singapore, January, 2010.
252. Symposium on Surface Science of Catalysis, ACS National Meeting, Boston, August, 2010.
253. Symposium on Chemical Reaction Dynamics at Surfaces, ACS National Meeting, Anaheim, California, March, 2011.
254. Symposium on "Interfacial Chemistry and Engineering and their Applications for Molecular and Organic Electronics", International Conference on Materials for Advanced Technologies, 2011, Singapore, June, 2011.
255. Eastern Analytical Symposium, Somerset, New Jersey, November, 2011.
256. Department of Physics, Humboldt University, Berlin, January, 2012.

257. Physical Chemistry Forum, Institute of Physical Chemistry, Peking University, Beijing, China, June, 2012.
258. Northern Pacific Ocean University Honorary Lectureship, Tianjin University School of Chemical Engineering and Technology, Tianjin, China, June, 2012.
259. College of Materials Science and Engineering, Sichuan University, Chengdu, China, June, 2012.
260. Institute of Advanced Materials, School of Materials Science and Engineering, Nanjing University of Posts and Telecommunications, Nanjing, China, July, 2012.
261. College of Chemistry, Chemical Engineering, and Materials Science, Soochow University, Suzhou, China, July, 2012.
262. Department of Chemistry, University of Houston, October, 2012.
263. Department of Chemistry, City College of New York, CUNY, March, 2013.
264. 50th Reunion Celebration, National Youth Science Camp Alumni Association, Snowshoe Mountain, West Virginia, July 2013.
265. Air Force Research Laboratory, Kirtland Air Force Base, Albuquerque, October, 2013.
266. Humboldt University, Department of Applied Physics, Berlin, October, 2013.
267. IIT Madras, Department of Chemistry, Conference on Low Energy Ion Scattering at Molecular Solids, Chennai, India, January, 2014.
268. Department of Environmental Chemistry, Shanghai Normal University, Shanghai, China, April, 2014.
269. Department of Chemistry, Shanghai Electric Power University, Shanghai, China, April, 2014.
270. Princeton Center for Theoretical Science, Origin of Biological Homochirality Workshop, Princeton University, April, 2014.
271. Department of Chemistry, National University of Singapore, Singapore, May, 2014.
272. Institute for Materials Research and Engineering (IMRE), National University of Singapore,

June, 2014.

273. Humboldt University-Berlin, KOSMOS Summer University, Chemistry and Physics of Novel Materials for Optoelectronics, Berlin, July, 2014.
274. Institute for Integrative Science (IRIS), Humboldt University-Berlin, July, 2014.
275. Plenary Speaker, International Symposium on Resource Chemistry, Shanghai Normal University, Shanghai, China, September, 2014.