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Birthdate: September 6, 1962
Citizenship: U.S.

EDUCATION:

Undergraduate: Washington University in St. Louis: A.B. (magna cum laude) in Chemistry, May 1984.

Graduate: University of California, Berkeley: Ph.D. in Chemistry, December 1988. Ph.D. Research Advisor: Gabor A. Somorjai. Thesis title: "Surface Science and Catalytic Studies on the Effects of Aluminum Oxide and Potassium on Ammonia Synthesis Over Iron Single Crystal Surfaces"

POSITIONS HELD:

Professor, Temple University	2001-present
Associate Professor, Temple University	1996-2001
Assistant Professor, State University of New York at Stony Brook	1989-1996
Visiting Scientist (postdoctoral), IBM, Almaden Research Center	1988-1989
Research Associate, University of California and Lawrence Berkeley Lab	1984-1988
Undergraduate Research with Peter P. Gaspar, Washington University	1982-1984

AWARDS:

National Science Foundation Young Investigator Award (NYI)	1992-1998
University Merit Award for Teaching and Curriculum Development at SUNY-Stony Brook	1995
Outstanding Chemistry Teaching Award, voted on by the Stony Brook undergraduate class of '94	1994
Outstanding Chemistry Teaching Award, voted on by the Stony Brook undergraduate class of '93	1993
Outstanding undergraduate chemistry major (Sowden Award) Washington University in St. Louis	1984

PUBLICATIONS

Refereed journal articles:

- (1) S.R. Bare, D.R. Strongin, G.A. Somorjai: Ammonia synthesis over iron single-crystal catalysts: the effects of alumina and potassium. *J. Phys. Chem.* 90 (1986) 4726-9.
- (2) P.P. Gaspar, D.M. Berowitz, D.R. Strongin, D.L. Svoboda, M.B. Tuchler, R.A. Ferrieri, A.P. Wolf: Reactions of recoiling carbon-11 atoms with toluene. *J. Phys. Chem.* 90 (1986) 4691-4.
- (3) D.R. Strongin, S.R. Bare, G.A. Somorjai: The effects of aluminum oxide in restructuring iron single crystal surfaces for ammonia synthesis. *J. Catal.* 103 (1987) 289-301.
- (4) D.R. Strongin, J. Carrazza, S.R. Bare, G.A. Somorjai: The importance of C_7 sites and surface roughness in the ammonia synthesis reaction over iron. *J. Catal.* 103 (1987) 213-15.
- (5) D.R. Strongin, G.A. Somorjai: On the rate enhancement of ammonia synthesis over iron single crystals by coadsorption of aluminum oxide with potassium. *Catal. Lett.* 1 (1988) 61-6.
- (6) D.R. Strongin, G.A. Somorjai: Effects of potassium on ammonia synthesis over iron single-crystal surfaces. *J. Catal.* 109 (1988) 51-60.
- (7) G.H. Vurens, D.R. Strongin, M. Salmeron, G.A. Somorjai: An ISS and AES study of alkali induced sintering of an iron oxide monolayer adsorbed on platinum(111). *Surf. Sci.* 199 (1988) L387-L93.
- (8) D.R. Strongin, G.A. Somorjai: Ammonia-pretreatment-induced restructuring of iron single-crystal surfaces: its effects on ammonia synthesis and on coadsorbed aluminum oxide and potassium. *J. Catal.* 118 (1989) 99-110.
- (9) D.R. Strongin, J. Mowlem: A NEXAFS study on the adsorption of ammonia on clean and potassium-promoted iron. *Surf. Sci.* 253 (1991) L417-L22.
- (10) D.R. Strongin, P.B. Comita: Surface chemistry of dimethylaluminum hydride and trimethylaluminum on polycrystalline aluminum. *J. Phys. Chem.* 95 (1991) 1329-33.
- (11) D.R. Strongin, J. Mowlem Using Hyperthermal Ions to Selectively Adsorb Surface Intermediates: Evidence for the Adsorption of CH_3 on Platinum from a 1-3 eV CH_3^+ Ion Beam: *Chem. Phys. Lett.* 187 (1991) 281.
- (12) D. Strongin, J. Mowlem: A near edge x-ray absorption fine structure study on the adsorption of ammonia on clean and potassium-promoted iron. *Surf. Sci.* 247 (1991) L209-L14.
- (13) M.W. Ruckman, M.F. Murray, J.K. Mowlem, J.F. Moore, D.R. Strongin: Near-edge and photoemission studies of condensed diborane. Evidence for intermolecular interactions in the solid phase. *Chem. Phys. Lett.* 198 (1992) 449-53.
- (14) D.R. Strongin, J.F. Moore, M.W. Ruckman: Synchrotron radiation assisted deposition of aluminum oxide from condensed layers of trimethylaluminum and water at 78 K. *Appl. Phys. Lett.* 61 (1992) 729-31.
- (15) D.R. Strongin, J.K. Mowlem, K.G. Lynn, Y. Kong: Efficient magnetic focusing of low-energy ions (1-5 eV) onto solids for use in surface chemistry studies. *Rev. Sci. Instrum.* 63 (1992) 175-8.
- (16) D.R. Strongin, J.K. Mowlem, M.W. Ruckman, M Strongin: Low temperature synthesis of boron nitride from condensed diborane and ammonia using synchrotron radiation. *Appl. Phys. Lett.* 60 (1992) 2561-3.

- (17) N.R. Gleason, C.A. Gerken, D.R. Strongin: Surface chemistry of water and hydrogen on polycrystalline titanium-aluminum, iron-aluminum, and nickel-aluminum and the effect of boron. *Appl. Surf. Sci.* 72 (1993) 215-25.
- (18) M.W. Ruckman, J.K. Mowlem, J.F. Moore, D.R. Strongin, M. Strongin: Ion and electron beam processing of condensed molecular solids to form thin films. *Mater. Res. Soc. Symp. Proc.* 279 (1993) 651-6.
- (19) N.R. Gleason, D.R. Strongin: A photoelectron spectroscopy and thermal desorption study of carbon monoxide on iron aluminide (FeAl) (110) and polycrystalline titanium aluminide (TiAl) and nickel aluminide (NiAl). *Surf. Sci.* 295 (1993) 306-18.
- (20) M.W. Ruckman, M.F. Murray, J.K. Mowlem, D.R. Strongin: Synthesis of carborane and boron-rich films from solid diborane using synchrotron radiation. *J. Vac. Sci. Technol., A* 11 (1993) 2477-82.
- (21) B.R. Sheu, D.R. Strongin: Adsorption and thermal decomposition of methanol on 3d transition metal (iron, nickel, titanium) aluminides: FeAl(110), NiAl, and TiAl. *J. Phys. Chem.* 97 (1993) 10144-51.
- (22) C.P. Wang, F. Jona, N.R. Gleason, D.R. Strongin, P.M. Marcus: Atomic structure of FeAl{001}. *Surf. Sci.* 298 (1993) 114-20.
- (23) J.F. Moore, D.R. Strongin, P.B. Comita, M.W. Ruckman, M. Strongin: Laser-induced deposition of alumina from condensed layers of organoaluminum compounds and water. *Appl. Phys. Lett.* 65 (1994) 368-70.
- (24) B.-R. Sheu, S. Chaturvedi, D.R. Strongin: Adsorption and Decomposition of Methanol on NiAl(110). *J. Phys. Chem.* 98 (1994) 10258-68.
- (25) B.-R. Sheu, D.R. Strongin: Methanol Chemisorption and Decomposition on FeAl(110): A High-Resolution Electron Energy Lose Spectroscopy and Temperature Programmed Desorption Study. *Langmuir* 10 (1994) 1801-6.
- (26) N.R. Gleason, S. Chaturvedi, D.R. Strongin: Interaction of water with NiAl(110): a TPD, EELS, and XPS investigation. *Surf. Sci.* 326 (1995) 27-41.
- (27) B.-R. Sheu, D.R. Strongin: Adsorption and thermal decomposition of methanol on the (100) surface of NiAl: a comparison to NiAl(110). *J. Catal.* 154 (1995) 379-90.
- (28) C.P. Wang, S.K. Kim, F. Jona, D.R. Strongin, B.R. Sheu, P.M. Marcus: Chemical reconstruction of the TiAl(010) surface. *Surf. Rev. Lett.* 2 (1995) 183-9.
- (29) S. Chaturvedi, R. Katz, J. Guevremont, M.A.A. Schoonen, D.R. Strongin: XPS and LEED study of a single-crystal surface of pyrite. *Am. Mineral.* 81 (1996) 261-4.
- (30) N.R. Gleason, D.R. Strongin: Water Adsorption and Thermal Decomposition on FeAl(110). *J. Phys. Chem.* 100 (1996) 18829-38.
- (31) J.F. Moore, D.R. Strongin: Ultrathin silicon oxide films deposited by synchrotron irradiation of condensed layers of silanes and water. *Thin Solid Films* 280 (1996) 101-06.
- (32) Y. Xu, M.A.A. Schoonen, D.R. Strongin: Thiosulfate oxidation: catalysis of synthetic sphalerite doped with transition metals. *Geochim. Cosmochim. Acta* 60 (1996) 4701-10.
- (33) S. Chaturvedi, D.R. Strongin: A trend in the C-O bond strength of CH₃O(ad) on NiAl(100), FeAl(100) and TiAl(010). Effect of the alloy Fermi level. *Catal. Lett.* 47 (1997) 105-09.
- (34) S. Chaturvedi, D.R. Strongin: Adsorption and Decomposition of Methyl Iodide on Low Index Planes of NiAl. *Langmuir* 13 (1997) 3162-71.

- (35) J.M. Guevremont, D.R. Strongin, M.A.A. Schoonen: Effects of surface imperfections on the binding of CH_3OH and H_2O on $\text{FeS}_2(100)$: using adsorbed Xe as a probe of mineral surface structure. *Surf. Sci.* 391 (1997) 109-24.
- (36) J. Bebie, M.A.A. Schoonen, M. Fuhrmann, D.R. Strongin: Surface charge development on transition metal sulfides: an electrokinetic study. *Geochim. Cosmochim. Acta* 62 (1998) 633-42.
- (37) S. Chaturvedi, D.R. Strongin: Methanol Chemisorption and Reaction on the (111) Crystallographic Plane of NiAl. *J. Phys. Chem. B* 102 (1998) 2970-78.
- (38) J.M. Guevremont, J. Bebie, A.R. Elsetinow, D.R. Strongin, M.A.A. Schoonen: Reactivity of the (100) Plane of Pyrite in Oxidizing Gaseous and Aqueous Environments: Effects of Surface Imperfections. *Environ. Sci. Technol.* 32 (1998) 3743-48.
- (39) J.M. Guevremont, A.R. Elsetinow, D.R. Strongin, J. Bebie, M.A.A. Schoonen: Structure sensitivity of pyrite oxidation: comparison of the (100) and (111) planes. *Am. Mineral.* 83 (1998) 1353-56.
- (40) J.M. Guevremont, D.R. Strongin, M.A.A. Schoonen: Thermal chemistry of H_2S and H_2O on the (100) plane of pyrite: unique reactivity of defect sites. *Am. Mineral.* 83 (1998) 1246-55.
- (41) J.M. Guevremont, D.R. Strongin, M.A.A. Schoonen: Photoemission of Adsorbed Xenon, X-ray Photoelectron Spectroscopy, and Temperature-Programmed Desorption Studies of H_2O on $\text{FeS}_2(100)$. *Langmuir* 14 (1998) 1361-66.
- (42) J.M. Guevremont, D.R. Strongin, D.H. Sun, A.P. Wright: Photoelectron spectroscopic study of the adsorption of CH_3 and Cl on a single crystal CuSi surface: modeling the direct reaction in vacuum. *Silicon Chem. Ind. IV, [Conf.]* (1998) 173-80.
- (43) M.A.A. Schoonen, Y. Xu, D.R. Strongin: An introduction to geocatalysis. *J. Geochem. Explor.* 62 (1998) 201-15.
- (44) S. Chaturvedi, D.R. Strongin: Adsorption and thermal decomposition of $\text{C}_2\text{D}_5\text{I}$ on the (110) and (111) planes of NiAl: A temperature programmed desorption and x-ray photoelectron spectroscopy study. *J. Vac. Sci. Technol., A* 17 (1999) 810-16.
- (45) A.R. Elsetinow, J.M. Guevremont, D.R. Strongin, M.A.A. Schoonen, M. Strongin: Oxidation of {100} and {111} surfaces of pyrite: effects of preparation method. *Am. Mineral.* 85 (2000) 623-26.
- (46) J. Han, S.I. Gheyas, Y. Wang, D.R. Strongin, A.P. Graham, B.J. Hinch, A.P. Wright: Thermal Chemistry of CH_3 on Si/Cu(100). *J. Phys. Chem. B* 104 (2000) 3078-84.
- (47) J. Han, S.I. Gheyas, Y. Wang, D.R. Strongin, B.J. Hinch, A.P. Wright: Thermal Chemistry of Chlorine on Si/Cu(100). *Langmuir* 16 (2000) 6541-45.
- (48) M. Schoonen, A. Elsetinow, M. Borda, D. Strongin: Effect of temperature and illumination on pyrite oxidation between pH 2 and 6. *Geochem. Trans.* (2000) 4.
- (49) J. Han, S.I. Gheyas, D.R. Strongin, B.J. Hinch and A.P. Wright: CH_3 and Cl_2 coadsorbed on Si/Cu(100). *Catalysis Letters* 68 (2000) 147-52 .
- (50) S.I. Gheyas, B.L. Strable, D.R. Strongin, and A.P. Wright: Cl_2 surface chemistry on Cu/Si(100): an ISS, XPS, and TPD study, *Surface Science* 474 (2001)129-138.
- (51) "An Aqueous Geochemical and Surface Science Investigation of the Effect of Phosphate on Pyrite oxidation ," A.. Elsetinow, D.R. Strongin, M.A.A. Schoonen, *Environmental Science and Technology* 35 (2001) 2252-57.

- (52) "Pyrite-induced hydrogen peroxide formation as a driving force in the evolution of photosynthetic organisms on an early Earth," Borda M. J., Elsetinow A. R., Schoonen M. A., and Strongin D. R. *Astrobiology* **1**(3), (2001) 283-288.
- (53) "Chlorosilane Production from Chlorine-Exposed Si(111) 7x7 and Cu/Si(111) Surfaces," Sysoev S. E., Potapenko D. V., Ermakov A. V., Hinch B. J., Strongin D. R., Wright A. P., and Kuivila C. *Journal of Physical Chemistry B* **106**(8), (2002) 2018-2025.
- (54) "Photochemical reactivity of ferritin for Cr(VI) reduction," Kim I., Hosein H., Strongin D.R., and Douglas T. *Chemistry of Materials* **14** (2002) 4874-4879
- (55) "A mechanism for the production of hydroxyl radical at surface defect sites on pyrite," Borda, M. J., Elsetinow, A. R., Strongin, D. R. and Schoonen, M. A. *Geochimica et Cosmochimica Acta*, **67** (2003) 935-939.
- (56) "Characterization of the structure and the surface reactivity of a marcasite thin film," Elsetinow, A. R., Strongin, D. R., Borda, M. J., Schoonen, M. A. and Rosso, K. M. *Geochimica et Cosmochimica Acta* **67** (2003) 807-812.
- (57) "A novel vertical attenuated total reflectance flow-through photochemical reaction cell for FTIR," Borda M., Strongin, D.R. and Schoonen M.A.A. *Spectrochimica Acta, Part A: Molecular and Biomolecular Spectroscopy* **59A**(5) (2003) 1103-1106.

In Press

- (58) "Suppression of pyrite oxidation in acidic aqueous environments using lipids having two hydrophobic tails," Elsetinow A.R., Borda M.J., Strongin D.R., and Schoonen M.A.A. *Advanced Environmental Research* (2003)

Patents

- (1) M. Strongin, M. Ruckman, D. Strongin, Method for producing high quality thin layer films on substrates, U.S. (Associated Universities, Inc., USA), Us, 1994, p. 10 pp.

Articles in Conference Proceedings (refereed)

- (1) P.B. Comita, D.R. Strongin, T.T. Kodas: Studies of laser-induced surface reactions by surface temperature modulation techniques. *Mater. Res. Soc. Symp. Proc.* **129** (1989) 125-31.
- (2) D.R. Strongin, P.B. Comita: Surface chemistry of dimethylaluminum hydride and trimethylaluminum on aluminum. *Mater. Res. Soc. Symp. Proc.* **158** (1990) 21-6.
- (3) J.F. Moore, D.R. Strongin, M.W. Ruckman, M. Strongin: Deposition of dielectric thin films by irradiation of condensed reactant mixtures. *Mater. Res. Soc. Symp. Proc.* **335** (1994) 81-6.
- (4) R.J. Kroczyński, D.R. Strongin, M.W. Ruckman, M. Strongin: Ion beam-assisted deposition of boron nitride from a condensed layer of diborane and ammonia at 78 K. *Mater. Res. Soc. Symp. Proc.* **316** (1994) 869-73.
- (5) J.E. Moore, S. Chaturvedi, D.R. Strongin: Chemistry and deposition driven by monoenergetic synchrotron radiation: initial studies of condensed silanes and water on noble metals. *Mater. Res. Soc. Symp. Proc.* **354** (1995) 561-4.

- (6) D.R. Strongin, J.F. Moore, M.W. Ruckman, M. Strongin: Growth of dielectric thin films by irradiation of condensed molecular precursors with synchrotron radiation. Mater. Res. Soc. Symp. Proc. 282 (1993) 631-6.
-

**PAPERS PRESENTED AT PROFESSIONAL MEETINGS:
lectures (denoted by *) and contributed papers at meetings**

- (1)* "Reactions of Recoiling ^{11}C Atoms with Toluene". D.R. Strongin and P.P. Gaspar, American Chemical Society meeting, St. Louis, Missouri, March 1984.
- (2)* "The Effect of Aluminum Oxide on the Ammonia Synthesis over Iron Single Crystals". D.R. Strongin and G.A. Somorjai, 33rd National Symposium of the American Vacuum Society, Baltimore, Maryland, October 1986.
- (3)* "The Effects of Aluminum Oxide and Potassium on Ammonia Synthesis Over Iron Single Crystal Surfaces". D.R. Strongin and G.A. Somorjai, North American Catalysis Society meeting, Berkeley, California, March 1987.
- (4)* "A Surface Science and Catalytic Study of the Effects of Aluminum Oxide and Potassium on Ammonia Synthesis Over Iron Single Crystal Surfaces". D.R. Strongin and G.A. Somorjai, American Chemical Society meeting, New Orleans, Louisiana, August 1987.
- (5)* "Reaction of Trimethylaluminum and Dimethylaluminum hydride on Polycrystalline Aluminum". Fall meeting of the Materials Research Society, Boston, Nov. 28 - Dec. 5, 1989.
- (6)* "Reactions of hyperthermal CH_3^+ on Platinum: Evidence for adsorbed CH_3 ". J. Mowlem and D.R. Strongin, American Chemical Society meeting, N.Y., N.Y., Aug. 25-30, 1991.
- (7) "Synthesis of BN from a Condensed Layer of Diborane and Ammonia," D.R. Strongin, J.F. Moore, M.W. Ruckman, and D.R. Strongin, Fall meeting of the Materials Research Society, Boston, Nov. 28-Dec. 5, 1991.
- (8)* "Reactions of Water and Hydrogen on TiAl, FeAl, and NiAl," N.R. Gleason, C.A. Gerken, and D.R. Strongin, American Chemical Society meeting, San Francisco, California, April 10, 1992.
- (9) "Synchrotron Assisted Deposition of Al_2O_3 and BN Thin Dielectric Films," D.R. Strongin, J.F. Moore, and M.W. Ruckman, Fall Meeting of the Materials Research Society, Boston, MA, December 3, 1992.
- (10) "Interactions of 1-10 eV CH_3^+ with Polycrystalline Silver," J.K. Mowlem and D.R. Strongin, Gordon Conference on Reactions on Surfaces, Ventura CA, March 8-12, 1993.
- (11) "Synthesis of Thin Dielectric Films using Synchrotron Radiation," Institute for Mechanics and Materials NYI Meeting, San Jose, CA, July 7-9, 1993.
- (12) "Methanol Chemisorption on FeAl(110) and NiAl(110)," American Vacuum Society Meeting, Orlando, FL, November 15, 1993.
- (13) "Ion Beam Assisted Growth of Boron Nitride From a Condensed Layer of Diborane and Ammonia at Cryogenic Temperatures (78 K)," Material Research Society Meeting, Boston, MA, December 2, 1993.

- (14)* "Water and Methanol Chemisorption and Reaction on NiAl(110) and FeAl(110)," American Chemical Society meeting, San Diego, March 12-17, 1994.
 - (15) "Core Level Excitation of Adsorbed Monolayers," J.F. Moore and D.R. Strongin, Gordon Conference on Reactions on Surfaces, Ventura CA, January 21-27, 1995.
 - (16) *"Chemistry of Water on the (100) Plane of Pyrite," American Chemical Society meeting, New Orleans, March 24-28, 1996.
 - (17) *"Effects of Surface Imperfection on the Surface Reactivity of FeS₂(100), Pyrite; Interaction of H₂O," American Chemical Society meeting, Parks Symposium, San Francisco, April 13-17, 1997.
 - (18) *"Reaction of H₂S on FeS₂(100): Effects of Sulfur Anion Vacancies," American Vacuum Society National meeting, San Jose, CA, October 28, 1997
 - (19) *"Structure Sensitivity of Pyrite Oxidation," Geological Society Annual Meeting, Toronto, October 26-29, 1998.
 - (20) "Pyrite Oxidation Studied with Surface Science," Chemical Reactions Gordon Conference, Ventura, CA, 1999.
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INVITED ADDRESSES:

- (1) "The Roles of Adsorbate Al₂O₃, K, and N Induced Restructuring of Iron in Ammonia Synthesis". Advances in Catalytic Chemistry IV (Symposium for John Sinfelt), Snowbird, Utah, October 1, 1989.
- (2) "Understanding Catalysis through Surface Science". Physics Department, SUNY-Stony Brook, September 20, 1990.
- (3) "Reactions of CH₃⁺ on Platinum". Materials Science Department, SUNY-Stony Brook, March 20, 1991.
- (4) "Using Electrons, Photon, and Ions to Probe Solid Surfaces," Department of Chemistry, Fordham University, Bronx, New York, March 10, 1992.
- (5) "Electronic Structure and Surface Reactivity of 3d Transition Metal Aluminides," Department of Chemistry, SUNY-Stony Brook, October 10, 1992.
- (6) "Water and Methanol Chemistry on 3d-Transition Metal Aluminides," Department of Chemistry, SUNY-Stony Brook, October 2, 1993.
- (7) "Chemisorption of Small Molecules on NiAl and FeAl Single Crystals," Department of Chemistry, Rutgers-New Brunswick, May 12, 1994.
- (8) "Synchrotron radiation, laser, and Ion assisted deposition of Dielectric Thin Films from Condensed Precursors at Cryogenic Temperatures," Materials Research Society, Fall Meeting (November 28), Boston, MA, 1994.
- (9) "The Chemisorption and Reaction of Methanol and Methyl Iodide on NiAl Single Crystal Surfaces," Department of Chemistry, SUNY-Oswego, October 20, 1995.
- (10) "Understanding Surface Selectivity of Alloys using Surface Science; Reactions of methyl iodide and methanol on NiAl Single Crystals" , Department of Chemistry, Rutgers-Camden, November 20, 1995.
- (11) "Chemisorption and Reaction of Water on Mineral Surfaces," Department of Chemistry, University of Massachusetts-Amherst, December 14, 1995.

- (12) "Understanding Surface Selectivity of Alloys using Surface Science; Reactions of methyl iodide and methanol on NiAl Single Crystals" , Department of Chemistry, Hope College, January 15, 1996.
- (13) "Reactions of Small Organic Molecules on 3d-Transition Metal Aluminides," Department of Chemistry, Temple University, February 1, 1996.
- (14) "Surface Chemistry on Pyrite, Department of Chemistry, "University of North Carolina-Wilmington, February 9, 1996.
- (15) "Reaction of Methanol on NiAl(100), FeAl(100), and TiAl(010): Effects of the Alloy Fermi Level," Columbia University, July 19, 1996.
- (16) "Effects of Short Range Order on the Surface Reactivity of Alloys and Minerals," Lehigh University, January 28, 1997.
- (17) "Effects of Surface Imperfection on the Surface Reactivity of FeS₂(100), Pyrite; Interaction of H₂O and H₂S," American Chemical Society meeting, San Francisco, April 13-17, 1997.
- (18) "Reactions of CH₃ and Cl on Cu/Si Model Catalytic Surface," Dow Corning Corporation, Midland, MI, November 5, 1997.
- (19) "Surface Chemistry on Alloy and Mineral Surfaces," Drexel University, Philadelphia, PA, November 12, 1997.
- (20) "Probing Surfaces with Electrons, Photons, and Ions," La Salle University, PA, March 23, 1998.
- (21) "Electron Spectroscopic Studies of CH₃ and Cl on Cu/Si Model Catalytic Surface," Conference on Silicon for the Chemical Industry IV, Geiranger, Norway, June 3-5, 1998.
- (22) "Surface Chemistry of Pyrite," Department of Energy Review, Pacific Northwest Laboratory, Richland, WA, February 2, 1999.
- (23) "Reactions of Pyrite in Oxidizing Environments," Physics Department, Temple University, March 1999.
- (24) "Reaction of Pyrite in Oxidizing gaseous and aqueous environments," Goldschmidt Conference, Cambridge (Harvard), MA, August 1999.
- (25) "Thermal Chemistry of CH₃ on Si/Cu(100)," American Chemical Society, San Francisco, CA, March 2000.
- (26) "Reaction of CH₃ and Cl₂ on Cu/Si(100) and Si/Cu(100) surfaces," Dow Corning Corporation, Midland, MI, April, 2000.
- (27) "Molecular controls on Pyrite surface reactivity," American Geophysical Union meeting, Washington D.C., May 2000.
- (28) "Surface Reactivity and Catalytic Properties of Minerals," Department of Energy Future of Catalysis Workshop, Berkeley, CA, March 2001.
- (29) "Fundamental Studies of Pyrite Reactivity," Johns Hopkins University, Department of Chemistry, Baltimore, MD, March 2001.
- (30) "Metal Disulfide Mineral Chemistry," Goldschmidt Conference, Hot Springs, VA, May 2001.
- (31) "Reactivity of Iron Disulfide in Oxidizing Environments," American Chemical Society Meeting, Chicago, IL, August 2001.
- (32) "Bioengineered Nanoparticles," Temple University, Department of Physics, March 2002.
- (33) "Bioengineered Nanoparticles for Environmental Remediation," US Environmental Protection Agency, Washington D.C. August 29, 2002.
- (34) "Molecular Controls on Pyrite Oxidation," International Mineralogical Association, Edinburgh,

Scotland, September 6, 2002.

- (35) "Surface Science and Catalytic Studies of Bioengineered Nano Metal and Metal Oxide Particles," Wayne State University, December 2002.
- (36) "Towards an understanding of Pyrite Oxidation and its suppression," Department of Energy-BES (Argonne National Laboratory), March 2003.
- (37) "Bioengineered nanoparticles for Environmental Remediation," Clemson University, March 2003.

RESEARCH IN PROGRESS

Three research projects, are underway in my laboratory at Temple University. The theme throughout the research is to understand the surface chemistry of materials important from both an environmental and technological standpoint. One project investigates the surface chemistry of pyrite the most ubiquitous sulfide in nature. Its decomposition reactions during coal-mining operations leads to a billion dollar environmental problem called acid-mine drainage. A second project investigates the synthesis and surface chemistry of nanoparticles that should have unique properties for environmental remediation and industrial catalysis. A third effort is tied in with a recently awarded NSF-Environmental Molecular Science Institute. This is one of 5 institutes set up so far in the U.S. Our group at Temple will be working with scientists at SUNY-Stony Brook, Penn State, and Brookhaven National Laboratory.

MASTER'S AND DOCTORAL THESES

Masters Theses Completed

- 1) "Investigations into the Formation of a Thin Boron Nitride Film from Condensed Diborane and Ammonia Using an Ion Beam Deposition," Robert J. Kroczyński, May 1994.
- 2) "Surface Science Studies of the Chemical Reactivity of Naturally Occuring Pyrite Single Crystals," Richard Katz, August 1996.

Doctoral Theses Completed

- 1) "Investigation of the Adsorption of Various Ion Fragments at and Above Hyperthermal Energies on Polycrystalline Metal Surfaces," James K. Mowlem, January, 1994.
- 2) "Adsorption and Thermal Decomposition of Methanol on the (100) and (110) Surfaces of Nickel and Iron Aluminides," Bor-Ru Sheu, December 1994.
- 3) "Chemisorption and Reaction of Water on the (110) and (100) Surfaces of First Row Transition Metal Aluminides," Nancy R. Gleason, May 1995.
- 4) "Soft X-ray Photochemistry of Condensed Mixed Reactants: Thin Film Growth and Ion Desorption,"

Jerry F. Moore, Jr., December 1995.

- 5) "Reactions of Alkyl Halides on the Three Low Miller Indicic Planes of NiAl," Sanjay Chaturvedi, December 1996.
- 6) "A Surface Science Study of Pyrite: The Effect of Surface Imperfections on the Adsorption and Reaction of Small Molecules Under Vacuum and Environmentally Relevant Conditions," Jeffrey Guevremont, September 1998.
- 7) "Molecular level studies of Pyrite," Alicia Elsetinow, December 2001.

SERVICE

Service to the Profession(selected) :

- 1) Reviewer for many journals
- 2) Panelist and/or reviewer for federal and private granting agencies
- 3) Organizer of scientific symposia

Departmental Service(current) :

1. Graduate Chair, Fall 1998 - present
2. Graduate Admissions Committee, Fall 1996 - present.
3. Equipment Committee, Spring 2002-present

University Service(last 5-years) :

1. College Graduate Committee 1998-present
2. Tenure and Promotion Committee 1999-2000
3. Subcommittee on Making Investments and Building Accountability Research and Graduate Education Task Force

TEACHING ACTIVITY

(Description of each course given below. Courses taught while at SUNY-Stony Brook are denoted by ^{SB}. All others were taught at Temple University)

<u>Year</u>	<u>Spring Semester</u>	<u>Fall Semester</u>
1990	<u>CHE304</u> ^{SB} Instrumentation Lab (38, majors) <u>CHE699</u> (1 grad. student)	<u>CHE133</u> ^{SB} General Chemistry Lab (150, majors & non-majors) <u>CHE699</u> (1 grad. student)
1991	<u>CHE144</u> ^{SB} Honors Chemistry Lab (38, majors) <u>CHE699</u> (3 grad. students)	<u>CHE353/693</u> ^{SB} Surface Chemistry (10, 2 undergrad. and 8 grad.) <u>CHE699</u> (3 grad. students)
1992	<u>CHE304</u> ^{SB} Instrumentation Lab (35, majors) <u>CHE699</u> (5 grad. students)	<u>CHE301</u> ^{SB} Physical Chemistry (102, majors and non-majors) <u>CHE699</u> (5 grad. students)
1993	<u>CHE304</u> ^{SB} Instrumentation Lab (32, majors) <u>CHE699</u> (5 grad. students)	<u>CHE301</u> ^{SB} Physical Chemistry (95, majors & non-majors) <u>CHE699</u> (5 grad. students)
1994	<u>CHE304</u> ^{SB} Instrumentation Lab (25, majors) <u>CHE699</u> (4 grad. students)	<u>CHE301</u> ^{SB} Physical Chemistry (97, majors & non-majors) <u>CHE699</u> (4 grad. students)
1995	<u>CHE526</u> ^{SB} Chemistry on Solid Surfaces (10 grad. students) <u>CHE699</u> (4 grad. students)	<u>CHE301</u> ^{SB} Physical Chemistry (80, majors & non-majors) <u>CHE699</u> (4 grad. students)
1996	<u>CHE304</u> ^{SB} Instrumentation Lab (25, majors) <u>CHE699</u> (3 grad. students)	<u>CHE231</u> Physical Chemistry (85, majors & non-majors)
1997		<u>CHE231</u> Physical Chemistry

(73, majors & non-majors)

1998 CHE721 Surface Science
(7 graduate students)

CHE231 Physical Chemistry
(75, majors & non-majors)

1999 CHE638 Chemical Kinetics
(8 graduate students)

CHE231 Physical Chemistry
(70, majors & non-majors)

2000 CHE638 Chemical Kinetics
(8 graduate students)

CHE231 Physical Chemistry
(69, majors & non-majors)
CHE638 Chemical Kinetics
(9 graduate students)

2001

CHE638 Chemical Kinetics

2002 CHE072 Introduction to Chemistry
(100 undergraduates in section)

CHE231 Physical Chemistry
(55 students)

2003 CHE638 Chemical Kinetics
(5 graduate students)

CHE231 Physical Chemistry

Brief Course Descriptions of Stony Brook Courses:

CHE133: Introduction to laboratory chemistry, including gas, liquid, and solid properties and analytical techniques.

CHE144: Introduction to laboratory chemistry for more advanced honor students.

CHE301: Physical Chemistry. Course concentrates on thermodynamics, but introduces quantum mechanics and statistical mechanics.

CHE304: Instrumentation laboratory that concentrates on electronic circuits. Introduction to analog and digital circuits. Projects include building equipment to measure dipole moments of solute, automatic titration, and construction of simple analog computer.

CHE353/693: Course developed by myself to introduce advanced undergraduates and graduate students to Surface Chemistry. Topics included the electronic and geometric structure of surfaces, and the chemisorption properties of solids.

CHE526: Similar to CHE353/693, but was offered to only graduate students. Required more of a background in physical chemistry than CHE353/693.

CHE699: Graduate Research.

Brief Course Descriptions of Temple Courses:

CHE072: Introduction to Chemistry

CHE231: Physical Chemistry. Course concentrates on thermodynamics, but introduces quantum mechanics and statistical mechanics.

CHE638: Gas, solution, and surface chemical kinetics were introduced and discussed in detail.

CHE721: Course developed by myself to introduce advanced undergraduates and graduate students to Surface Chemistry. Topics included the electronic and geometric structure of surfaces, and the

chemisorption properties of solids.