

Robert John Hamers

Department of Chemistry
University of Wisconsin-Madison
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Post-graduate Experience:

Steenbock Professor of Physical Science, 2014-present

Wisconsin Distinguished Professor, 2007-present
Chemistry Department Chair, 2007-2010
Chemistry Department Associate Chair, 2006-2007
Arthur Adamson Professor of Chemistry (WARF Chair), 2008-2013
Irving Shain Chair, 2004-2009
Evan P. Helfaer Chair, 1996-2001
Professor of Chemistry, 1994-present
Associate Professor 1990-1994

CTO and Co-Founder, Silatronix, Inc., Start-up company commercializing organosilicon electrolytes for safe, high-performance lithium ion batteries (15 employees), 2007-present.

Visiting Scholar, University of Oxford, Dept. of Materials, Oxford, England, 2000-2001

Research Staff Member, IBM T.J. Watson Research Center, Yorktown Heights, NY, 1986-1990

Visiting Scientist, IBM T.J. Watson Research Center, Yorktown Heights, NY, 1985-1986

Research Areas:

Structure, electronic properties, chemical reactivity, and photochemistry of semiconductor materials. Nanoscale molecular architecture of surfaces and interfacial structures. Environmental impact of nanomaterials. Hybrid interfaces of inorganic materials with organic and biological materials for photocatalysis, and energy storage.

Education:

Ph. D. 1986, M.S. 1982, Cornell University
Major Field: Physical Chemistry; Minor Fields: Applied Physics, Theoretical Chemistry
Thesis Topic: State-to-state energy transfer in molecule-surface collisions: NO/Ir(111)
Research Advisors: Paul L. Houston and Robert P. Merrill

B.S. with Honors and Distinction, Chemistry Course, University of Wisconsin-Madison, 1980.

Selected Honors and Awards:

Post-Graduate

Giddings Lecturer, University of Utah, 2015
Steenbock Professor of Physical Science, UW-Madison, 2014-2025
Wisconsin Distinguished Professor (UW-System), 2014-present
Ronald T. Pflaum Colloquium, Inaugural Lecturer, Univ. of Iowa Dept. of Chemistry, October 2014
Frontiers in Chemical Research Distinguished Lecturer Series, Texas A&M University, 2013
Class of 1960 Fellow, Williams College, 2012
American Chemical Society National Award in Colloid and Surface Chemistry, 2012
H.H. King Lecturer, Kansas State University, September 2010

Medard Welch Award, AVS Science and Technology Society, 2009
International Nanostructures, Surfaces and Interfaces Prize (12th International Conference on Formation of Semiconductor Interfaces, Weimar, Germany), 2009
Wisconsin Alumni Research Foundation Named (Arthur Adamson) Professor, 2008-13
Wisconsin Distinguished Professor (Univ. of Wisconsin System), 2007-2012
Fellow of the American Association for the Advancement of Science (AAAS), elected 2004
American Chemical Society, Arthur Adamson Award for Distinguished Service in the Advancement of Surface Chemistry, 2005.
Irving Shain Chair, University of Wisconsin-Madison Dept. of Chemistry, 2004-2008
Recognition as "Highly-Cited Researcher", principal field of Materials Science, Institute for Scientific Information (Web of Science)
IBM Faculty Award, 2002 and 2003
NSF "Special Creativity" Awards, 2000-2002 (DMR) and 2002-2004 (Chemistry)
John Simon Guggenheim Memorial Foundation Fellowship, 2000-2001
Kellett Mid-Career Award, University of Wisconsin-Madison, 2000 (Outstanding researcher between 5 and 20 years past tenure)
S.C. Johnson Co. Distinguished Fellow, 2000-2003
Vilas Associates Award, 1998
Evan P. Helfaer Chair in Chemistry, University of Wisconsin-Madison, 1996-2001
Innovation Recognition Program, Union Carbide Corporation, 1996 and 1997
Fellow of the American Vacuum Society (now AVS Science and Technology Society), elected 1994.
Peter Mark Memorial Award, American Vacuum Society, 1993 (Outstanding Scientist or Engineer under 35 years of age)
National Science Foundation Presidential Faculty Fellowship, 1992-1997
Camille and Henry Dreyfus New Faculty Award, 1990-1995
IBM Research Division Award for STM Studies of Surface Reactions on Semiconductors, 1989
IBM Corporation Outstanding Innovation Award for Scientific Accomplishments with Scanning Tunneling Spectroscopy, 1987
Wentink Outstanding Graduate Student Award, Cornell University Dept. of Chemistry, 1985
National Science Foundation Graduate Fellowship, 1980-83

Professional Affiliations:

American Association for the Advancement of Science (Fellow)
American Chemical Society
American Vacuum Society (Fellow)
Materials Research Society
Phi Beta Kappa
PROFS (Public Representation Organization of the Faculty Senate)
Sustainable Nanotechnology Organization
Wisconsin Alumni Association (lifetime member)

Selected Professional and National Service:

EAGLE School Board of Directors, member 2015- present
Senior Editor, Accounts of Chemical Research (American Chemical Society), 2015-present
Editorial Advisory Board, Accounts of Chemical Research (American Chemical Society), 2014-2015
Editorial Advisory Board, "Environmental Science: Nano" (Royal Society of Chemistry), 2013-2016
American Chemical Society, Chair of the Colloid and Surface Chemistry Division (3-year elected sequence of Chair-elect, Chair, Past Chair), 2013-2015
American Chemical Society, National Awards Selection Committee Member, 2012-2014

Member, American Chemical Society Graduate Profile Advisory Board, 2013
Member, External Review Committee, Univ. of Iowa Dept. of Chemistry, Sept. 2012
National Nanotechnology Infrastructure Network review and reverse site visit, June & August 2013.
ARPA-E RANGE Program Review Panel, July 2013
American Chemical Society, co-organizer, symposium on Nanomaterials and the Environment, Spring 2012 National Meeting, March 2012
Co-Chair, Workshop on Nanomaterials and the Environment (sponsored by NSF), June 28-30, 2011
Chair, U.S. Naval Research Laboratory External Review Committee for Chemistry/Materials, 2011
Member, State of Wisconsin Legislative Council Special Committee on Nanotechnology, 2010-2011
(more information at <http://www.legis.state.wi.us/lc/committees/study/2010/NANO/index.htm>)
International Organizing Committee (3-person primary organizing committee), European Conference on Diamond and Diamond-like Materials, 2007-present.
Moderator, Gordon Research Conference on Chemical Reactions at Surfaces, Feb. 2009.
Chair, U.S. Naval Research Laboratory External Review Committee for Chemistry/Materials, June 2008
Science Foundation Ireland (SFI), Proposal Reviewer, 2012
Austrian Science Foundation (FWF) Proposal Reviewer, 2012
Dept. of Energy, Energy Frontier Research Centers Review Team, 2012
Dept. of Energy, Early CAREER Reviewer, 2011, 2012, 2013
National Science Foundation Centers for Chemical Innovation Site Visit team, Irvine, CA, 2011
National Science Foundation SBIR Phase I Review Panel, 2010 and 2011
National Science Foundation Science and Technology Center Review Panel, 2011
National Science Foundation CAREER Review Panel, 2009 and 2010
National Science Foundation MRSEC Review Panel, 2008.
Co-chair, Workshop on "Materials Education" Workshop (sponsored by NSF), 2007-2008
National Program Committee Co-chair (member of 4-person primary organizing committee)
Materials Research Society, Spring 2008 National Meeting, San Francisco, CA
Visiting Committee Member, Cornell Center for Materials Research, 2007
Chair, External Review Committee, U.S. Naval Research Laboratory, Chemistry/Materials Areas, 2005
National Science Foundation External Review Panel, Penn State University MRSEC, 2006
National Science Foundation Review Panel, Chemical Bonding Centers, 2005
National Science Foundation Review Panel, Small Business Innovative Research (SBIR) Review Panel, 2005
National Research Council of Canada, Peer Review Site Visit Team, Steacie Institute for Molecular Sciences, Ottawa, Canada, (2-day review + written report), 2004
Organizer/Chair, 65th Annual Physical Electronics Conference, Madison, WI, June, 2005
National Nanotechnology Initiative Research Directions II Workshop, National Academy of Sciences, Washington, DC (Discussion leader and lead report-writer on "Energy and the Environment"), September, 2004
Symposium Organizer, Materials Research Society National Spring Meeting, "Biological –Inorganic Hybrid Materials" (50 talks in 7 sessions). 2004
Moderator, 2003 Gordon Research Conference on Chemistry of Electronic Materials, Connecticut College.
Invited Lecturer/Instructor, ACS-PRF Summer School on Physical Chemistry on the Nanometer Scale, Washington State University (4 lectures), July-Aug., 2003
Member, General (Organizing) Committee, Physical Electronics Conference, 2002-2004
NSF Review Panel, SBIRs and Nanotechnology, 2003
NSF Site Review Team, Ohio State Environmental Molecular Sciences Institute, Columbus, OH, May, 2003.

American Vacuum Society, Trustees of the Scholarships and Awards Committee (National elected position) 2001-2004

Editorial Advisory Board, "Surface Science" (Elsevier Press), 2001-2007

Editorial Advisory Board, "Surface Science Reports (Elsevier), 2006- 2009

Program Chair, 10th NSF Workshop on Materials Chemistry, Tempe, AZ, 2003

External Advisory Board, NSF Environmental Molecular Sciences Institute on Oxidative Catalysis, Northwestern University

Organizing Committee, 9th NSF Workshop on Materials Chemistry, Newark, DE, 2002

Chair, Local Arrangements, 8th NSF Workshop on Materials Chemistry, Madison, WI, 2001

American Vacuum Society NSTD Division, National Program Committee Chair, 1999

Invited Lecturer/Instructor, Enrico Fermi International School of Physics, Varenna, Italy (3 lectures), July, 2000

American Vacuum Society Nanometer Science and Technology Division, Vice-chair (1997) and Chair, 1998

NSF Site Visit Committee for Environmental Molecular Sciences Institutes: Columbia University, Princeton University, Northwestern University, 1999

International Review Committee, Osaka University "Center of Excellence", Osaka, Japan, Jan. 1998

Defense Science Study Group, Institute for Defense Analyses/DARPA, 1996-1997

Materials Research Society, focused session co-Organizer, 1996.

American Physical Society, Co-Organizer, 2 sessions, 1996 National March Meeting, Cincinnati

8th International Conference on Scanning Tunneling Microscopy, Proceedings Editor, 1995-96

8th International Conference on Scanning Tunneling Microscopy, Program Committee Chairman, Snowmass, CO, 1995

American Vacuum Society: National Program Committee Member, 1994

American Vacuum Society: Executive Board Member, Nanometer Science and Technology Division, 1992

American Physical Society: co-organizer, focused session on Atomistic Processes of Epitaxial Growth on Si

National Science Foundation, site review team for Environmental Molecular Sciences Institutes, 1998

NSF Review Panel Environmental Molecular Sciences Institutes (EMSI), January, 1998

NSF Review Panel for Materials Synthesis and Processing Initiative, 1994

NSF Review Panel for Chemistry Instrumentation Grant Program, 1997

Materials Research Society, developed and taught first short course on "Scanned Probe Microscopies", 1987-1989

Reviewer for Applied Physics, Applied Physics Letters, Journal of Applied Physics, DOE, International Science Foundation, Journal of Chemical Physics, Journal of Physical Chemistry, Journal of Vacuum Science and Technology, Langmuir, Nature, NSF, Nature, Petroleum Research Fund, Physical Review, Review of Scientific Instruments, Science, Surface Science

Selected University Service/Administration

Director, Center for Sustainable Nanotechnology (multi-institutional interdisciplinary research grant, centered at UW-Madison), Phase I (2012-2015) and Phase II (2015-2020, renewable to 2025)

Search and Screen Committee, Vice Provost for Faculty and Staff, 2014

Search and Screen Committee, Dean of the College of Letters and Science, 2013

Co-founder, Associate Director and member of the Executive Committee, UW-Madison Nanoscale Science and Engineering Center (NSEC); Thrust 1 Co-leader, 2005-2008, Thrust 4 co-leader 2008-2014

Co-PI, REU (Research Experience for Undergraduates) Site on Chemistry of Materials for Renewable Energy, 2013-2016.

Working Group on Undergraduate Research, via Vice Provost for Teaching & Learning, 2012-2013

Commission of Faculty Compensation and Economic Benefits, 2013-present

Materials Science Program/Materials Engineering Reorganization Committee Member, 2013-2014

Executive Committee, UW-Madison Materials Research Science and Engineering Center (MRSEC), 2005-2013; Interdisciplinary Research Group Co-leader, 2005-13,

College of Letters and Science Honors Program Advisory Committee 2007-2010

Internal Selection Committee, UW-Madison NSF NIRT Grants, 2005

University Committee on Conflict of Interest, 2003-2005

Workshop on Leadership Development. Developed workshop on leadership skills for graduate students as part of College of Engineering Teaching Improvement Program, Jan. 2005 and Jan. 2006

Selection Committee, Packard Award Nominees, 2002

Chair, Grad School Ad Hoc Strategic Plan Committee, UW-Madison Materials Science Program, 1998-1999

Physical Sciences Representative, workshop for junior faculty on "Mentoring Graduate Students", Jan. 1999.

Ad Hoc Review Committee for Dept. Of Geology and Geophysics, 1997

Ad Hoc Committee on Office of Sponsored Programs Mission and Visions, 1997

Campus Committee on Microscopy and Image Analysis, 1994-1998

Graduate School Research Committee, 1992-1995

Materials Science Program Advisory Committee, 1990-present

Chemistry Department Service (partial list):

Materials Chemistry Ph.D. Program Founder (2002) and Program Chair, 2002-2007, 2011-2012

CHOPS (Chemistry Opportunities, for first-generation college, under-represented groups), 2012-2014

Finance/Rooms Committee, 1997-1999, 2004-2006, 2011-present

Department Chair Search & Screen Committee , 2014-2015

Department Chair, 2007-2010

Associate Department Chair 2006-2007

Post-tenure Review Committee Chair, 2006-2007

Fundraising/Development Committee, 2006-2008, 2011-present

Analytical Sciences Division Chair, 1997-1999, 2004-2006, 2011-2012

Department Web Committee, Chair 1996-1998, 2004-2007; Member 2010-present

Chair, Faculty Search Committee, 2001-2002, 2002-2003, 2003-2004

Search/Screen Committee for Chemistry Department Chair, 1998, 2004, 2012

Chair, Materials Chemistry Graduate Recruiting, 2002-2006

Chair, Analytical Chemistry Graduate Recruiting, 2002-2004

Chair, Chemistry Department Shops Committee, 1991-1997

Chemistry Department Undergraduate Curriculum Committee, 1993-1997

Chemistry Department Computing Committee, 1991-2003, 2008-present

Selected K-12 and Public Outreach Activities:

Intel Science Talent Search: Mentored Madison Memorial High School student on research project 2010-2012; semifinalist in national completion Jan. 2013

Siemens Math, Science, and Technology Competition: Mentored Madison Memorial High School student Sohil Shah on research project 2010-2012; regional finalist

Wisconsin State Legislature: Testified at Informational Hearing of the Wisconsin State Assembly Committee on Public Health on “Applications and Environmental Impact of Nanoscale Materials”, Oct. 2009

PEOPLE (Pre-College Enrichment Opportunity Program for Learning Excellence) Program: Workshop on Scanning Electron Microscopy (workshops performed by grad students), 2004-present

Engineering EXPO: participated in EXPO displays, 2009, 2011, 2013

Wisconsin Rural Leadership Program: Presentation and extensive laboratory tour to statewide group of community leaders primarily drawn from rural communities

EAGLE School Science Olympiad Team. Assisted team, worked extensively with students and traveled to state middle-school state competition in Oshkosh, 2011

EAGLE School Science Mentor Program: Mentoring of 8th grade students working on ~8-week science projects; 1-2 students each year, 2002-present

Madison Metropolitan School District: Summer Science Intern Program: Mentoring of high school students conducting full-time summer research at UW-Madison; 1-2 students each year, 2003-present

Edgewood High School Science Mentor Program: Mentored high school student conducting full-time research at UW, summer 2006

Radio Program: Taped radio interview on “Nanotechnology and Energy”, broadcast on WORT, 2008

Television Program: “In Wisconsin” on Nanotechnology, taped ~7-minute segment, broadcast 3 times across Wisconsin, 2006

Radio Program: Live 30-minute radio interview on “Nanotechnology”, broadcast on WORT radio, 2006

Citizen’s Consensus Conference on Nanotechnology (2005): served as expert panelist

Reporter’s Workshop on Nanotechnology. Presentation and hands-on activities for reporters from across the U.S., 2005

Legislator’s Workshop on Nanotechnology. Presentation and hands-on activities for legislators and policymakers, principally from Wisconsin, 2006

Conversations in Science: Program for high school and middle school teachers, televised and re-broadcast, 2005

Intel Science Talent Search: Mentoring high school student on research project, 2006 and 2012

Women of Science Day. Hands-on workshop and tours with operation of scanning electron microscope, 2005.

Radio Project: Worked with middle school students to construct > 100 functioning AM radios. (2002-2003)

“Nano Cafe” on Nanotechnology and the Environment (public outreach event), Speaker and participant, 2007

“The Atom”, part of the “World of Chemistry” videos hosted by Roald Hoffman 1986

Invited Talks, 1990-present

2016

November	AVS National Meeting, Nashville, TN
May	Air Force Molecular Dynamics Program, Invited Speaker, Washington DC
May	New Diamond Nano-Carbon (NDNC), Xi’an, China
April	Founder’s Day Lecturer, Wisconsin Alumni Club of Cincinnati, OH
March	ACS National Meeting, San Diego, CA
January	Academic Leadership Training Workshop, Washington, DC

2015

December Brown University, EPA Superfund Talk, Providence, RI
November Tufts University Chemistry Department Seminar, Boston
November Sustainable Nanotechnology Organization (Keynote speaker), Portland, OR
September University of Utah, Giddings Lecturer (2-3 talks) , Salt Lake City, UT
June Nanostructures: Theory Meets Experiment, London, England
June Gordon Research Conference on Environmental Nanotechnology, Stowe, VT
February Gordon Research Conference on Energy Materials (discussion leader), Ventura, CA

2014

December Materials Research Society National Meeting, Boston, MA
October Ronald T. Pflaum Colloquium Lecture, University of Iowa
July Faraday Discussions, Royal Society of London, Sheffield, UK
May University of Minnesota Women's Faculty Retreat on Leadership, Keynote speaker
May 8th International New Diamond and Nano-Carbon Conference, Chicago, IL
March Pittsburgh Conference on Analytical Chemistry, Chicago, IL
March American Chemical Society National Meeting, Dallas, TX
March Materials Research Society National Meeting, San Francisco, CA
February Dow Chemical Company, Interfacial Sciences Group
February 19th Hasselt Diamond Workshop, Hasselt, Belgium
February University of Florida Dept. Seminar

2013

November 17th International Conference on Atomically Controlled Surfaces Interfaces and Nanostructures, Tsukuba, Japan (2 invited talks)
October British Petroleum International Surface Science Workshop (2 invited talks), Naperville, IL
September Sci-X National Meeting, Milwaukee, WI
September National Meeting of the American Chemical Society, Indianapolis
September Georgia Tech, Chemistry Dept. Colloquium
September University of North Carolina-Chapel Hill Seminar
May 7th International Conference on New Diamond and Nano-Carbon, Singapore
April Gordon Conference on Chemical Reactions at Surfaces (Switzerland) Discussion Leader
March National Meeting of the American Chemical Society
February Univ. of Iowa Chemistry Colloquium
February Frontiers in Chemistry Distinguished Lecturer (series of 3 lectures), Texas A&M University

2012

November National Meeting of the AVS Science and Technology Society, Tampa, FL
October University of Minnesota 8th Annual Nano Workshop
October University of Michigan Materials Chemistry Seminar
October Class of 1960 Lecture, Williams College
September University of Delaware Inorganic Chemistry Seminar
March National Meeting of the American Chemical Society, San Diego, CA
(Colloid and Surface Chemistry Award Address)
March National Meeting of the American Chemical Society, San Diego, CA (Barb Karn Symposium)
March International Workshop on Nanostructures and Nanoelectronics, Tohoku University, Sendai, Japan (presented by R. Ruther due to timing conflict)

2011

October Regional Meeting of the American Chemical Society, St. Louis, MO
October Michigan State University, Chemistry Departmental Colloquium
April National Meeting of the Materials Research Society, San Francisco, CA
May Evonik/Degussa Corporation, Dresden, Germany
April Center for Computational Materials Science, University of Bremen, Germany
April University of Wageningen, The Netherlands, Chemistry Seminar
April University of Delft, Netherlands, Chemistry Seminar

2010

December National Meeting of the Materials Research Society, Boston, MA
October UW-Eau Claire Chemistry Dept. Seminar
September Kansas State University, H.H. King Lecture
July Telluride Conference on Semiconductor Surface Chemistry, Telluride, CO
May Joint Sino-German Workshop on Chemical and Biological Sensing, Suzhou, China
May 4th International Conference on New Diamond and Nano-Carbon (NDNC-2010), Suzhou, China
March National Meeting of the American Chemical Society, San Francisco, CA
March 3M Corporation, Minneapolis, MN
March 27th International Battery Seminar and Exhibit, Ft. Lauderdale, FL
January 37th Conf. on the Physics and Chemistry of Surfaces and Interfaces (PCSI-37), Santa Fe, NM

2009

November National Conference of the Materials Research Society, Boston, MA
October National Conference of the AVS Science and Technology Society
July 12th Intl. Conference on the Formation of Semiconductor Interfaces, Weimar, Germany
(plenary talk)
June 3rd International Conf. on New Diamond and Nano-Carbon (NDNC-2007), Traverse City, MI
April University of Illinois Urbana-Champaign
April Northwestern University
March 26th International Battery Seminar and Exhibit, Ft. Lauderdale, FL
February Gordon Research Conference on Chemical Reactions at Surfaces, Ventura, CA

2008

December 8th International Workshop on Electrochemical Double-Layer Capacitors and Related Technologies, Deerfield Beach Florida
November 5th International Symposium on Surface Science and Nanotechnology (ISSS-5), Sendai, Japan
May 2nd International Conference on New Diamond and Nano Carbon (NDNC-2008), Taipei, Taiwan
May Center for Nanoscale Materials, Argonne National Labs

April National Meeting of the American Chemical Society, New Orleans, LA
March University of California – San Diego
February Notre Dame University
January Korean Electric Power Research Institute (KEPRI), Daejeon, South Korea
January Chemistry Dept. Colloquium, University of Virginia, Charlottesville, VA.

2007

November 9th International Conference on Atomically Controlled Surface and Interfaces (ACSI-9), Japan

June International Conference on Nanoscience and Nanotechnology for Biological/Biomedical/Chemical Sensing, Hong Kong (plenary talk)
 June Oak Ridge National Laboratory
 May Argonne National Laboratory Center for Nanoscale Materials
 April Oak Ridge National Laboratory Center for Nanoscale Materials
 April National Meeting of the American Chemical Society
 March National Meeting of the Materials Research Society, San Francisco, CA
 February Notre Dame University
 January Gordon Conference on Electrochemistry, Ventura, CA
 January Howard University, Washington, DC

2006

December National Meeting of the Materials Research Society, Boston, MA
 October Tenth International Symposium on Nanoscience at Surfaces, Tokyo, Japan
 October Department Colloquium, University of Minnesota
 September Argonne National Laboratory Workshop on In-Situ Characterization of Surface and Interface Structures and Processes
 September 17th European Conference on Diamond, Estoril, Portugal (Plenary speaker)
 July Telluride Workshop on Semiconductor Surface Chemistry, Telluride, CO
 July International Workshop on Nanoscale Analysis, Zurich, Switzerland (Keynote lecturer)
 May International Conference on Diamond Science and Technology, North Carolina
 May Argonne National Laboratory Center for Nanoscale Materials
 April Department Colloquium, Columbia University
 March International Symposium on Bio-electronics, Tohoku University, Sendai, Japan.
 March National Meeting of the American Chemical Society, Atlanta, GA
 January International Workshop on Nano-Crystal / Nano-Particle Diamond, Tokyo, Japan.

2005

December Pacificchem 2005, Honolulu, Hawaii.
 November National Meeting of the Materials Research Society, Boston, MA
 July Gordon Conference on Dynamics at Surfaces, MA
 October Department Colloquium, University of Minnesota
 September Argonne National Laboratory Workshop on In-Situ Characterization of Surface and Interface Structures and Processes
 May NATO Advanced Research Workshop on Nanocomposite Materials, Santorini, Greece
 May Argonne National Laboratory Center for Nanoscale Materials
 April Department Colloquium, Columbia University
 March National Meeting of the American Chemical Society (Adamson Award presentation), Anaheim, CA
 March National Meeting of the Materials Research Society, San Francisco, CA
 March Symposium on Surfaces & Interfaces in Nano Bioelectronics, Okazaki Japan (Plenary)
 February Nanotechnology Symposium, Walter Schottky Institute, Munich, Germany, Plenary speaker
 February Pittsburgh Conference on Analytical Chemistry ("Pittcon"), Orlando, FL

2004

November Inter-Pacific Workshop on Nanoscience and Nanotechnology, Hong Kong
 October FACSS (Federation of Analytical Chemistry and Spectroscopy Societies), Portland, OR
 September Plenary Speaker, 15th European Conference on Diamond, Riva Del Garda, Italy
 July Beckman Scholars Symposium, Irvine, CA

June Plenary Speaker, Northwest/Rocky Mountain Regional ACS Meeting, Salt Lake City
 March National Meeting of the American Chemical Society (2 invited talks), Anaheim, CA.
 November Department Colloquium, University of Chicago
 October Smiths Detection, Inc. (seminar on biological detection technologies)
 July UC-Irvine Physical Chemistry Seminar
 June DuPont Corp, "Discovery" Seminar, Wilmington, DE
 May University of California-Santa Barbara
 May Rutgers University Physical Chemistry Seminar
 April Cornell University, "Frontiers of Physical Chemistry" colloquium
 February Center for Fundamental Materials Research, Michigan State University
 January Purdue University Analytical Chemistry Seminar
 January Center for Nanoscale Science and Technology, University of Illinois Urbana-Champaign

2003

November National Meeting of the American Vacuum Society
 October Regional Meeting of the ACS, Pittsburgh PA
 October Harvard University Physical Chemistry Seminar
 September Purdue University Physical Chemistry Seminar
 September University of Illinois Champaign-Urbana, Materials Science Seminar
 July Argonne National labs Workshop on Nanoscience
 July NSF/PRF Summer School on "Physical Chemistry at the Nanoscale", (3 lectures) Pullman, WA
 May Plenary Speaker, NSF/EPA Grand Challenge Workshop on Nanotechnology and the Environment, Arlington, VA
 May 8th International Symposium on Diamond Materials, Paris, France
 April Argonne National Labs
 March National ("March") Meeting of the American Physical Society, Austin, TX (Cancelled due to snowstorm)
 February Gordon Research Conference on Chemical Reactions at Surfaces, Ventura, CA
 February IBM-Yorktown Heights Physical Sciences Seminar
 February Sensir Technologies, Inc.

2002

Dec. National Meeting of the Materials Research Society, Boston, MA
 October Regional Joint Meeting of the American Vacuum Society and the Electrochemical Society, Chicago
 October 50th Midwest Solid-State Conference, Urbana, IL
 August Telluride Workshop on Chemistry at Silicon Surfaces (presented by M. Schwartz)
 July American Association for Crystal Growth (AACG), Lake Tahoe, CA.
 March National Meeting of the American Chemical Society, Orlando, FL
 January PCSI-29 (Physics and Chemistry of Semiconductor Interfaces), Santa Fe, NM
 October Ohio State University Analytical/Physical Seminar
 May University of California – San Diego, Physical Chemistry Seminar
 March Johns Hopkins University, Physical/Analytical Chemistry Seminar
 January Pacific Northwest Laboratories, Hanford, WA
 January Washington State University, WA., Physical chemistry seminar

2001

October Yamada Conference on Functional Organic Materials, Tokyo, Japan (trip cancelled due to travel security issues).

October Chips to Hits Conference, San Diego, California
 June Gordon Conference on Analytical Chemistry, Rhode Island
 May UCLA Chemistry Dept. Seminar
 May Grinnell College Chemistry Dept. Colloquium
 May IBM-Yorktown Heights Physical Sciences Seminar
 April Peking University Chemistry Department Seminar, Beijing, China.
 April Chinese Academy of Sciences Seminar, Beijing, China
 April University Institute of Physical Chemistry Seminar, Beijing, China
 Feb. Oxford University "Nanoscale Materials" seminar, Dept. of Materials

2000

December Pacifichem 2000 Honolulu, Hawaii
 October University of Michigan, Physical/Analytical Seminar
 October Michigan State University, Chemistry Departmental Colloquium
 October Univ. of Missouri Chemistry Dept. Colloquium
 June-July Enrico Fermi International School of Physics, "Nanostructures" (invited lecturer)
 March National Meeting of the American Physical Society, Minneapolis, MN
 March National Meeting of the American Chemical Society
 February University of Oregon physical chemistry seminar , Eugene, OR
 January Utah State University, physics colloquium, Logan, UT
 January University of Utah physical chemistry seminar, Salt Lake City, Utah

1999

December 3rd International Symposium on Surface Science for Nanodevice Fabrication, Tokyo, Japan
 November Stanford University physical chemistry seminar
 November National Meeting of the Materials Research Society, Boston, MA
 September 9th International Conference on Precision Science and Technology for Perfect Surfaces, Japan
 Society for Precision Engineering, Osaka, Japan
 September Dartmouth University physics dept. colloquium
 July U.S. Naval Research Laboratories, Washington, DC
 July Gordon Research Conference on Electronic Materials, Henniker, NH
 March Gordon Research Conference on Chemical Reactions at Surfaces, Ventura, CA

1998

December 6th International Congress on Scanning Tunneling Microscopy, Tokyo, Japan
 December National Meeting of the Materials Research Society (MRS), Boston, MA
 December University of Tokyo Chemistry Dept. Seminar, Tokyo, Japan
 October Iowa State University Dept. of Chemistry
 August National Meeting of the American Chemical Society, Boston, MA
 July Telluride Workshop on "Chemistry at Silicon Surfaces"
 May Indiana University Dept. of Physics Seminar
 March 6th International Symposium on Surfaces and Thin Films, Taipei, Taiwan
 February Vanderbilt University Departmental Chemistry Seminar
 February University of Pennsylvania Physical Chemistry Seminar
 January Symposium on Scanning Tunneling Microscopy, Osaka University, Japan (**plenary talk**)

1997

December Harvard University Physical Chemistry Seminar

September 17th European Conference on Surface Science (ECOSS17), Twente, The Netherlands
(Plenary talk)

September IUVSTA (International Union of Vacuum Science and Technology Associations) Workshop on Surface Chemistry at the Nanoscopic Scale, Ost Polgeest, The Netherlands

July First International Symposium on Scanning Tunneling Spectroscopy, Poznan, Poland

June Union Carbide Corp, Charleston, W.V. Innovation Recognition Seminar

June Goldschmidt Conference on Geochemistry, Tucson, AZ

May Scanning Microscopy International, Chicago, IL

April University of Minnesota Physical Chemistry Seminar

March, International Conference on Microscopy of Semiconductor Materials, Oxford, England

March Princeton University Physical Chemistry Seminar

March Northwestern University Physical/Analytical Seminar

March University of Pittsburgh Physical Chemistry Seminar

February University of Colorado-Boulder Physical Chemistry Seminar

1996

May American Vacuum Society, Regional Mtg., Milwaukee, WI

March National Meeting of the American Chemical Society, New Orleans, LA

January International Symposium on Structure and Dynamics at Surfaces, Weizmann Institute of Science, Rehovot, Israel.

January Hebrew University, Jerusalem, Israel

1995

December International Symposium on Scanning Tunneling Microscopy, Kanazawa Institute of Technology, Kanazawa, Japan

December Atom Technology Symposium, JRCAT Atom Technology Program, Tsukuba Science Center, Tsukuba, Japan

October National Meeting of the American Vacuum Society, New Orleans, LA

October FACSS (Federation of Analytical Chemistry and Spectroscopy Societies), St. Louis, MO. (Presented by student, S. Higgins)

September Columbia University, Chemistry Departmental Seminar

August International Workshop on Semiconductor Interfaces, Germany.

May Joint US-Japan Binational Workshop on Atomic Scale Mechanisms of Epitaxial Growth, Honolulu, Hawaii.

April National Meeting of the American Chemical Society, Anaheim, CA

January Gordon Research Conference on Chemical Reactions at Surfaces, Ventura, CA

1994

November National Meeting of the American Institute of Chem. Engineers (AIChE), San Francisco.

August National Meeting of the American Chemical Society, Washington, DC

April Wisconsin Undergraduate Research Symposium, Ripon, WI (plenary talk)

March March National Meeting of the American Physical Society, Pittsburgh, PA

March National Meeting of the American Chemical Society, San Diego, CA

January International Society for Optical Engineering, Los Angeles, CA

April College of Wooster (Wooster, Ohio) Chemistry Department Seminar

March Wisconsin Undergraduate Research Symposium (plenary talk), Ripon, WI

January Northwestern University Physical/Analytical Seminar

1993

November American Vacuum Society National Meeting, Orlando, FL
October Optical Society of America/9th Interdisciplinary Laser Science Conference, Toronto, Canada
October Ohio State University, Chemistry Department Colloquium
August Microscopy Society of America National Meeting, Seattle, WA
April University of Wisconsin-Stevens Point, Chemistry Department Seminar
March Gordon Research Conference on "Frontiers of STM", Ventura, California
January Ohio State University, Nanometer Materials Colloquium

1992

November University of Illinois, Materials Science Colloquium, Urbana, IL,
September Oak Ridge National Laboratory, Chemistry Colloquium, Oak Ridge, Tennessee,
July Gordon Research Conference on Physical Electrochemistry, New Hampshire
June First International Workshop on Photons and Scanned-Probe Microscopies, Konstanz, Germany

June NSF Workshop on Atomic Resolution Microscopy, MD
May Scanning Microscopy International Conference, Chicago, IL
April University of Wisconsin-Eau Claire, Chemistry Department Seminar
April National Meeting of the American Chemical Society, San Francisco
March March National Meeting of the American Physical Society, Indianapolis, IN
March U.S. Naval Research Laboratory, Chemistry Colloquium, Washington DC

1991

August Experimental Program to Stimulate Competitive Research (EPSCOR), plenary lecture.
August 4th Chemical Congress of North America/ National ACS Meeting, New York, NY (2 talks)
October University of Chicago, James Franck Institute Lecture
August University of Houston, Physics-Astronomy Seminar
July West Virginia University, Chemistry/Physics Departmental Seminar
June National Institute for Standards and Technology (NIST), Interface Science Seminar, Washington, DC

April Northwestern University Materials Science and Engineering Colloquium
February Regional Meeting, American Vacuum Society, Minneapolis, MN

1990

December American Chemical Society Regional Meeting, New Orleans, LA
December University of Wisconsin-Milwaukee, Physics Department Colloquium
November State University of New York at Stony Brook, Physics Colloquium
November Materials Research Society National Meeting, Boston, MA
November American Vacuum Society Regional Meeting, Minneapolis, MN
October American Vacuum Society Regional Meeting, Batavia, IL
August 12th International Congress for Electron Microscopy, Seattle, WA
July 4th International Conference on Scanning Tunneling Microscopy (late discovery), Baltimore, MD

Talks/Presentations before 1990 are not available (records lost).

Research Supervision: Current and Former Students and Postdocs

Current postdoctoral research associates:

(None)

Current Ph.D. Students (most senior students listed first)

Shuyu Fang
Jason Bandy
Laura Slaymaker
Margaret Robinson
Mimi Hang
Arielle Mensch
Kirsten Louthan
Melinda Shearer
Sarah Guillot
Kelly Zhang
Miao Yang
Shuo Li
Austin Henke
Catherine Alvarez
Elizabeth Laudadio

Current Undergraduate Students, research supervision:

Madeleine Meyer
John Van Gilder
Sohil Shah

Former postdoctoral research associates:

- 16) Juan Tuberquia** (Ph.D. 2011, Vanderbilt)
Current position: Staff Scientist, Dow Chemical, Freeport TX
- 15) Jixin Chen** (Ph.D. 2010, Texas A&M)
Current position: Postdoc, Univ. of Texas
- 14) Lee Bishop** (Ph.D. 2010, UC-Berkeley)
Current position: Lawrence Hall of Science, Berkeley, CA
- 13) Monica Usrey** (Ph.D. 2008, Univ. of Illinois)
Current Position: R&D Program Manager, Silatronix, Inc., Madison, WI
- 12) Lingzhi Zhang** (co-advised with Bob West)
Current Position: Assistant Professor, China.
- 11) Kevin Metz** (Ph.D. 2007, Chemistry, University of Wisconsin-Madison)
Current Position: Assistant Professor, Albion College, Albion, MI
- 10) Paula Colavita** (Ph.D. 2005, Univ. of South Carolina)
Current Position: Lecturer, Trinity College, Dublin, Ireland
- 9) Joseph Beck;** 2003-2006.
Current position: Privately employed
- 8) Masanori Shinohara** (Nagasaki University); 12/04 – 9/05.
- 7) Matt Marcus** (Ph.D. 2004, Physics, Univ. of Wisconsin-Madison)
Current position: Honeywell Research, Minneapolis, MN
- 6) Chang Soo Lee** (Ph.D. 2003, Kyushu University, Japan), 2003-2004
Current Position: Research, Samsung Corporation, Korea.
- 5) Zhang (“Jenny”) Lin** (Ph.D. Peking University, postdoc 2000-2002)
- 4) Mark Ellison** (Ph.D. Stanford, 1997, R.N. Zare; postdoc 1997-1999).
Current Position: Associate Professor, Ursinus University
- 3) Phil Bond** (Ph.D. 1998) Co-advised with Jillian Banfield, Dept. of Geology & Geophysics

- Current Position: Assistant Professor, Dept. of Microbiology, Univ. of East Anglia, UK
- 2) Michael Bronikowski** (Ph.D. Stanford 1992, R.N. Zare; postdoc RJH 1992-1993)
Current Positions: Research Staff, Lawrence Berkeley Labs
- 1) Dr. Gad Haase** (Ph.D. Hebrew University, 1991, M. Asscher; postdoc with RJH 1991-1992)
Current Position: Texas Instruments Corp.

Ph.D. students Completing Degree:

47) Jamie Wheeler:

Ph.D. Thesis: Understanding the environmental chemistry and biological impacts of nanomaterials
Current position: Researcher, 3M Corporation, Minneapolis, MN

46) Marco Torelli

Ph.D. Thesis: Tools for studying the nano-bio interface
Current position: Postdoc, Adamas Nanotechnologies

45) Linghong Zhang, Ph.D. 2015, Materials Chemistry

Ph.D. Thesis: Photo and electrochemical reduction of CO₂ at diamond surfaces
Current position: Postdoc, Argonne National Laboratory

44) Di Zhu, Ph.D. 2014, Materials Chemistry

Ph.D. Thesis: Photoelectron emission from diamond
Current Position: Power Environmental Energy Research Institute (PIRRE)

43) Rebecca Putans, Ph.D. 2014, Materials Chemistry

Ph.D. Thesis: Functionalization of Nanomaterial Surfaces for Light-harvesting and Nanotoxicology Applications
Current Position: Researcher, 3M Corporate Research Labs, Minneapolis, MN

42) Caroline English, Ph.D. 2014, Materials Chemistry

Current Position: Senior Process Engineer, Intel Corp.

41) Yizheng Tan, Ph.D. 2013, Materials Chemistry

Ph.D. Thesis: Optical and Electronic Studies of Photostability and Charge Dynamics
Current Position: Postdoc, Lawrence Berkeley Labs

40) Michelle Benson, Ph.D. 2013, Materials Chemistry

Ph.D. Thesis: Assembly of charge-transferring heterojunctions using "click" chemistry
Current Position: Research Integrity Specialist, Columbia University

39) Joseph Yeager, Ph.D. 2013, Physical Chemistry

Ph.D. Thesis: Interaction of Organosilicon Electrolytes with Silicon Anodes
Current Position: Laboratory Instructor, Smith College

38) Kacie Louis, Ph.D. 2012, Physical Chemistry

Ph.D. Thesis: Surface functionalization of titanium dioxide nanoparticles: Photo-stability and reactive oxygen species (ROS) generation
Current Position: Research Scientist, Akzo Nobel Co., Brewster, NY

37) Xin Chen, Ph.D. 2011, Physical Chemistry

Ph.D. Thesis: Chemistry at the Organosilicon-based Electrolyte/electrode Interface in Lithium-ion Batteries
Current Position, Research Scientist, Saudi Arabian Basic Industries Corporation (SABIC), Exton, PA

- 36) Rose Ruther, Ph.D. 2012, Materials Chemistry**
Ph.D. Thesis: Molecular Interfaces to Electronic Materials
Current Position: Oak Ridge National Laboratory
- 35) Ryan Franking, Ph.D. 2011, Materials Science Program**
Ph.D. Thesis: Development of the titanium dioxide-organic interface and mechanistic studies of photochemical grafting on titanium dioxide
Current Position: 3M Corporate Research Labs, Minneapolis, MN
- 34) Stephanie Hogendoorn, Ph.D. 2011, Physical Chemistry**
Ph.D. Thesis: Functionalization and electrocatalysis on carbon nanofibers
Current Position, Research Chemist, Akzo Nobel Co., Brewster, NY
- 33) Xiaoyu Wang , Ph.D. 2010, Materials Chemistry**
Ph.D. Thesis: Mechanistic Study of Photochemical Functionalization on Group IV Semiconductors
Current Position: Research Scientist, Akzo Nobel Co., Brewster, NY
- 32) Elizabeth Landis, Ph.D. 2010, Materials Chemistry**
Ph.D. Thesis: Molecular Monolayers for Attaching Electroactive Molecules to Vertically Aligned Carbon Nanofibers
Current Position: Assistant Professor, Holy Cross College, Worcester, MA
- 31) Divya Goel, Ph.D. 2009, Materials Chemistry**
Ph.D. Thesis: Growth and Assembly of Functionalized Nanomaterials: Using Organic-Inorganic Polymer Hybrid Systems
Current Position: Intel Corp., Dallas, Texas.
- 30) Andrew Mangham, Ph.D. 2009, Materials Chemistry**
Ph.D. Thesis: Ligand Effects on Semiconductor Nanoparticles in Two Contexts: Self-Assembly and Environmental Stability
Current Position: Graduate Student, UW-Madison
- 29) Bo Li, Ph.D. 2008, Analytical Chemistry**
Ph.D. Thesis: Nanowire-Based Chemical / Biological Sensor Fuses
Current Position: 3M Corporation, Singapore.
- 28) Jeremy Streifer, Ph.D. 2008, Physical Chemistry**
Ph.D. Thesis: Photochemical Functionalization of Hydrogen Terminated Silicon Surfaces with Functional Organic Alkenes
Current Position: Intel Corporation, Oregon.
- 27) Heesuk Kim, Ph.D. 2008, Materials Chemistry**
Ph.D. Thesis: Chemical Grafting of Molecular and Biomolecular Layers to Compound Semiconductor Surfaces
Current Position: Korean Institute for Science and Technology (KIST), Seoul, Korea
- 26) Bin Sun, Ph.D. 2007, Materials Chemistry**
Ph.D. Thesis: Integration of Carbon-based Materials with Microelectronic & Electromechanical Devices For Biosensing Applications
Current Position: Intellectual Property Associate, Foley & Lardner, Washington, DC
- 25) Lu Shang Ph.D. 2007, Analytical Chemistry**

Ph.D. Thesis: Assemble Nanowires into Novel Biosensor Configurations Using Dielectrophoresis
Current Position: Vice President, Guangxi Architecture Design and Research Institute.

24) Kiu-Yuen Tse, Ph.D. 2007, Materials Chemistry

Ph.D. Thesis: Electrical Properties of Nano-Structured Carbons in Aqueous and Non-Aqueous Electrolytes
Current Position: Senior Research Chemistry, 3M Corporate Research Labs, Minneapolis, MN

23) Kevin Metz, Ph.D. 2007, Materials Chemistry

Ph.D. Thesis: Synthesis and Applications of Hybrid Nanowires
Current Position: Associate Professor, Albion College, Albion, MI

22) Sarah Baker, Ph.D. 2006, Materials Chemistry

Ph.D. Thesis: Synthesis and Functionalization of Carbon Nanotubes and Nanofibers
Current Position: Staff Scientist, Lawrence Berkeley Labs

21) Beth Nichols, Ph.D. 2006, Analytical Chemistry

Ph.D. Thesis: Photochemical Functionalization of Diamond
Current Position: Dow Chemical, Midland, MI

20) Tami Lasseter Clare, Ph.D. 2005, Materials Chemistry

Ph.D. Thesis: Functional Monolayers for Direct Electrical Biosensing
Current Position: Assistant Professor, Portland State University

19) Kevin Weidkamp, Ph.D. 2005, Physical Chemistry

Ph.D. Thesis: Surface chemistry of pentacene on clean and chemically modified Si(001)
Current Position: Epic Computer Systems, Madison, WI

18) Wensha Yang, Ph.D. 2005, Materials Chemistry

Ph.D. Thesis: Biologically modified diamond thin films for biosensing applications
Current Position: Research Scientist, Cedars-Sinai Medical Center, Los Angeles, CA

17) Liang Fang, Ph.D. 2003, Materials Chemistry

Ph.D. Thesis: Attachment of Pi-conjugated Molecules on Si(001) Surfaces and application in Molecular and Organic Electronics
Current Position: Arkema Chemical, King of Prussia, PA

16) Wei Cai, Ph.D. 2003, Analytical Chemistry

Ph.D. Thesis: Chemical and Biochemical Modification of Silicon Surfaces
Current Position: General Electric Corporate Research and Development Center, Shanghai, China

15) Michael Schwartz, Ph.D. 2003, Materials Chemistry

Ph.D. Thesis: The Role of Dimer Structure in Controlling Organic Reactions on Group IV Surfaces
Current Position: Staff Scientist, University of Wisconsin-Madison Medical School.

14) Christina Hacker, 2003, Analytical Chemistry

Ph.D. Thesis: Optical Characterization of Anisotropic Organic Layers on Si(001) Surfaces
Current Position: Research Staff, National Institute for Standards and Technology (NIST).

13) Bo Hu, Ph.D. 2002, Analytical Chemistry

Ph.D. Thesis: Chemical and Structural Study at the Interface between Metal Sulfides and Acids
Current Position: General Electric Research and Development, Shanghai, China

- 12) Xiaoping Cao, Ph.D. 2002, Analytical Chemistry**
 Ph.D. Thesis: Intefacial Structure and Bonding of -Containing Molecules with Silicon Surfaces
 Current Position: Pharmacia Upjohn Research Center
- 11) Sarah Coulter, Ph.D. 2001, Analytical Chemistry**
 Ph.D. Thesis: Reactions of substituted aromatic Molecules on the Si(001) Surface
 Current Position: Research, Clorox Corp.
- 10) Molly McGuire, Ph.D. 2001, Analytical Chemistry**
 Ph.D. Thesis: Elemental Sulfur on Oxidized Sulfide Mineral Surfaces
 Current position: Associate Professor, Bucknell University
- 9) Jennifer Hovis, Ph.D. 1999, Physical Chemistry**
 Ph.D. Thesis: Cycloaddition Chemistry on 2x1 Reconstructed Surfaces
 Current position: 496 Analytics
- 8) Hongbing Liu, Ph.D. 1998, Analytical Chemistry**
 Ph.D. Thesis: Surface Chemistry of Unsaturated Organic Molecules on Si(001) Surfaces
 Current Position: Elf Atochem Corporation, King of Prussia, PA
- 7) Jun Shan, Ph.D. 1997, Physical Chemistry**
 Ph.D. Thesis: A Surface Infrared Spectroscopy Study of Reaction Chemistry during Silicon
 Chemical Vapor Deposition Processes
 Current Position: Research Staff, Informix Corp, UW-Madison
- 6) Ernest Frank, Ph.D. 1997, Analytical Chemistry**
 Ph.D. Thesis: Nanoscale Surface Restructuring of Silver Thin Films by Scanning Tunneling
 Microscopy
 Current Position: Group Leader, Heterogenous Catalysis, Dow Chemical/ Union Carbide Corp.
- 5) Xiangxiong Xhen, PhD. 1996, Analytical Chemistry**
 Ph.D. Thesis: Direct Imaging of Small Molecules via Cryogenic Scanning Tunneling
 Microscopy
 Current Position: Applications Development, Thermo Corporation
- 4) Yajun Wang, Aug. 1996, Analytical Chemistry**
 Ph.D. Thesis Atomic Scale Surface Structural and Chemical Characterization using STM:
 Application to Silicon CVD and Doping Processes
 Current Position: Manager, AT&T Lucent Technologies, Chicago, IL
- 3) Steven Higgins, Ph.D. August 1996, Analytical Chemistry**
 Ph.D. Thesis: Microscopic Investigations of the Chemical and Electrochemical Reactions at
 the Galena (PbS)/Water Interface
 Current Position: Professor, Wright State University
- 2) Marc McEllistrem, Ph.D. 1993, Analytical Chemistry**
 Ph.D. Thesis: Photovoltaic Effects at Semiconductor Surfaces Probed with STM
 Current position: Associate Professor, UW-Eau Claire
- 1) Chen Dong, Ph.D. 1992, Physics** (spent last 1.5 years of Ph.D. program in my group)
 Research Topic: Surface Chemistry of Disilane on Si(001) Probed with STM
 Current position: IBM Corporation

M.S. Students Completing Degree:

Elvin Morales (2014)

Courtney Stavis (2012)
Xueying He (2012)
Michael McCoy, (2010, passed away while in Ph.D. Program, posthumous M.S. degree)
Patrick Warf2008
Jermal Chandler, 2006
Amanda Hennip, 2004
Arianne Baker, 2004
Jason Otis, 2003.
Shenqi Xie, 2001.
Rebecca Oliphant, 2000.
Seth Lindberg, Dec. 1996
Alan McIntyre, May 1996
Curt Waltman, 1995
Yaling Wang, M.S. 1994
Brian Cousins, M.S. 1992

Undergraduate Research Students Completing Research: (partial list; does not include Chem 116 students)

Hunter Wayland (REU Student) 2014

Synthesis of nanoscale LiNiMnCo ("NMC") Cathode Materials via flux growth

Edward (Ted) McClain (REU student), 2014

Construction of an automated system for atomic layer deposition.

Stephanie Sanders (REU student) 2013

Design of a prototype surface calorimeter

James Rosenberger 20110-2013

Connor Firth 2012-2013

Electrocatalytic reduction of CO₂.

Ailin Mao 2012-2013

Characterization of next-generation battery materials.

Kajsa Jackson 2012-2013

Synthesis of novel ligands for nanoparticles

Brian Ferrer 2013

Synthesis of nanoparticles

Vong Lor 2013-2014

Interaction of natural organic material with nanoparticles

Richard Barltrop (visiting student from Bristol University, UK) 2012-2013

Lithiated Silicon Anodes for Next-Generation Lithium Ion Batteries

Phillipa Armitage-Mattin (visiting student from Bristol University, UK), 2013-2013

Synthesis of novel ligands for nanoparticle studies

Yujue Wang (visiting student from Nanjing University), 2012-2013

Fabrication and Testing of Next-generation lithium-ion batteries

Shaoyang Wang, 2011-2012

Click chemistry on metal oxide surfaces

Yan Lao, 2011-2012

Lithiated silicon for lithium ion batteries

Jesse Pankamo, 2011-2012

Novel surface ligands for stable nanoparticles

Nigel Becknell, 2010-2012

Photocatalytic reduction of CO₂ on diamond (Currently graduate student at UC-Berkeley)

Jesse Pankamo, 2011-2012

Synthesis of Novel Surface-binding Ligands
Allison Cardiel, 2011 summer (REU student from Carleton College)
 "Click" chemistry for nanoparticle heterojunctions

Shaoyang Wang (2012)
 Click chemistry on metal oxide nanoparticles

Maximilian Turner, 2011-2012
 Novel high-temperature batteries using carbon monofluoride cathode.

Christine Ferng, 2010-2011
 Chemical functionalization of diamond to resist protein binding

Prashanth Prabakaran, 2019-2010
 Synthesis of Eu:YVO₄ nanoparticles for nano-imaging applications

Zack Gerbec, 2008-2009
 Grafting of molecules to metal oxide surfaces

Anthony Nguyen, 2006-2008
 Synthesis of Nanocrystalline Titania

Jake Henrichs, 2005-2007
 Nanoparticle interactions with biological cells

Shawn Andrews, 2004-2006
 Photocatalysis at nanocrystalline diamond

Libby Smith, 2003-2004
 Electrochemical Modification of Silicon Surfaces

Fatlume Berisha, 2003-2004
 Synthesis of Molecules for Surface Photoligation Processes

Matt Kim, 2002-present
 Surface Reactions of Metal Sulfide Minerals

Guobin Zhang, 2002
 Chemical Modification of Carbon Nanotubes

Jessie Birrenkott, B. S. 1997
 Dissolution of Pyrite Minerals

Paul Kirsch, B.S. 1995, Hilldale Fellow, 1993
 STM studies of TiO₂ in Electrochemical Solutions

Joseph Sweeney, B.S. 1994
 Decomposition of Nickel Carbonyl for fabrication of STM Tips

Jason Young, B.S. 1993
 Novel Methods of Fabricating Sub-micron Insulating Tips for Electrochemical Scanning Tunneling Microscopy"

Lisa Buller, B.S. 1992, Hilldale Fellow, 1992
 B.S. Thesis, "STM Studies of the Oxidation of the Si(001) Surface"
 Completed Ph.D. degree with Hector Abruna at Cornell University.

Steven Brown, B.S. 1993
 Electrochemical Scanning Tunneling Microscope

David Reeder, B.S. Chem. Eng. 1993
 Software for scanning tunneling microscopy
 Completed Ph.D. in Chemical Engineering at University of Minnesota

Ernest Darkoh-Ampem, B.S. 1993
 Senior Project, "Electrochemical STM"

Past K-12 research supervision:

Madison School District Summer Science Internship Program (Full-time research for high-school students for the summer).

Kate Scholz (2014, 2015): Electrochemistry of lithium ion battery electrodes

Newton Wolfe (2013, 2014): Field emission into liquids

Sohil Shah (2011, 2012): Chemically Directed Assembly of Nanoparticle Heterojunctions (currently undergraduate chemistry major at UW-Madison)

Nicholas Pasternack (2011), electrochemistry of the Zn/O₂ system (currently undergraduate at University of Florida)

Pratyusha Kalluri (2010): Density functional calculations of molecular adsorbates on metal oxides. *Priya was elected vice-president of her class at MIT in 2012*

Alex Huhn (2009): Growth of ZnO Nanorods (currently undergraduate at UW-Madison)

Bennett Mortenson (2008): Photocatalytic Reduction of CO₂.

Brian Ji (2007), CdSe Nanoparticles

Eric Meyer (2005 and 2006): Growth of CdSe Nanocrystals (B.S. Chemistry Yale 2011, now Business Analyst at McKinsey & Co., San Francisco CA)

Jesse Benck (2004): Photochemical Modification of Nanocrystalline Diamond (currently Ph.D. student in chemical engineering, UW-Madison)

Paresh Agarwal (2003): Growth of hybrid metal-semiconductor nanowires. (currently Ph.D. student in chemistry at UC-Berkeley)

Kate Skog (2002): Metal Sulfide Minerals (currently chemistry Ph.D. student in chemistry at UW-Madison)

Edgewood High School Independent Study / Research:

Aaron Burr (2006): Growth of metal nanotubes

EAGLE School Science Mentor Program: (for 8th grade students; ~6-week commitment partnering with a graduate student to do a small project)

Anna Compas (2013)

James Tautges (2012)

Shivani Kumar (2011)

Michael Stoneman (2009)

Jordan DuBeau (2008)

Riley Larget (2007)

Bennet Mortenson (2006)

Adam Schneider (2005)

Rich Pang (2004)

Ilari Shafer (2003)

Recent Classroom Teaching:

Semester	Class
Fall 1997	621 – Instrumental Analysis
Spring 1998	628 – Electronics and Instrumentation
Fall 1998	621 – Instrumental Analysis
Fall 1999	621 – Instrumental Analysis
Spring 2000	630 – Chemistry of Materials

Fall 2001	630 – Chemistry of Materials
Spring 2002	329 – Quantitative Analysis
Spring 2003	329 – Quantitative Analysis
Fall 2003	329 – Quantitative Analysis
Spring 2004	630 – Chemistry of Materials
Fall 2005	628 – Electronics and Instrumentation
Spring 2006	Leave (retention)
Fall 2006	630 – Inorganic Materials
Spring 2007	628 – Electronics and Instrumentation
Fall 2007-Spring 2010	Chem 901 (intro to graduate school), Team-teaching courses, reduced load as department chair
2011-2012	Sabbatical
Spring 2012	524 –Instrumental Analysis
Fall 2012	630 –Chemistry of Materials
Spring 2013	628 - Electronics and Instrumentation
Fall 2013	329 - Quantitative Analysis
Spring 2014	630 - Chemistry of Materials
Fall 2014	329 - Quantitative Analysis

Current Research Support:

Project: Phase II Center for Chemical Innovation, The Center for Sustainable Nanotechnology
Agency: NSF (PI: R. Hamers; with 15 other non-PI Senior Personnel)
Award Amount: \$20,000,000 Period: 09/1/2015 - 8/31/2016
(RJH is the Center Director and Principal Investigator on the grant)

Project: High-voltage cathode materials for lithium ion batteries
Agency: Dow Chemical (PI: R. Hamers, co-PIs T. Kuech, M. Mahanthappa, D. Morgan)
Award Amount: \$2,980,336 Period: 8/15/2011- 08/14/2016
(RJH is the Principal Investigator and overall project director)

Project: Photoelectron emission at Diamond-liquid interfaces
Agency: NSF (R.Hamers, PI)
Award Amount: \$470,000 Period: 06/01/2012 - 05/31/2015

Project: Functional Carbon Nano-skins: Integrating Nanostructured Oxides with Molecular Systems
Agency: NSF (R.Hamers, PI)
Award Amount: \$400,000 Period: 9/1/2013-8/31/2016

Project: REU Site: Chemistry of Materials for Renewable Energy
Agency: NSF (A. Greenberg, PI; R. Hamers, Co-PI)
Award Amount: \$277,335 Period: 1/1/2013- 12/31/2016
(Joint REU program between Dept. Chemistry and Dept. Chemical Engr.)

Project: Fundamental Studies of Charge Transfer in Quantum Confined Nanostructure Heterojunctions and Applications to Solar Energy Conversion
Agency: DOE (Song Jin, PI; John Wright and R. Hamers, co-PI)
Award Amount: \$1,600,000 Period: 09/15/20012 - 09/14/2015
(RJH support for ~ 1 student + some summer salary)

Project: Molecular scale studies of peptide interactions with metal oxide nanoparticles
Agency: NSF (PI: Joel Pedersen, co-PI Hamers)
Amount: \$433,000 Period: 06/01/2012 - 05/31/2016

Project: State Economic Development Grant, Lithium ion battery electrolytes
Agency: State of Wisconsin. (R. Hamers, PI)
Award Amount: \$73,809 Period: 9/1/2014 - 8/31/2015

Project: Dynamics of photoexcitation and photocatalysis at nanostructured carbon interfaces
Agency: AFOSR (PI: Zanni, co-PI's Arnold and Hamers)
Request Amount: \$270,000/yr total, ~82k/yr to RJH Period: 03/15/2012 - 3/14/2015

Project: Hot-Electron Chemistry at Solid-Liquid Interfaces
Agency: AFOSR (PI: Hamers, co-PI's Nathanson and Schmidt)
Request Amount: \$557,734 total, ~82k/yr to RJH Period: 03/15/2014 - 3/14/2017

Robert J. Hamers
Publications and Patents

Submitted publications, not yet accepted:

Published and/or Accepted Publications:

- [312] Eric S. Melby, Arielle C. Mensch, Samuel E. Lohse, Dehong Hu, Galya Orr, Catherine J. Murphy, Robert J. Hamers, and Joel A. Pedersen, "Formation of supported lipid bilayers containing phase-segregated domains and their interaction with gold nanoparticles", *Environmental Science: Nano* **2016**, *3*, 45.
- [311] Mimi N. Hang, Ian L. Gunsolus, Hunter Wayland, Eric S. Melby, Arielle C. Mensch, Katie R. Hurley, Joel A. Pedersen, Christy L. Haynes, Robert J Hamers. "Impact of Nanoscale Lithium Nickel Manganese Cobalt Oxide (NMC) on the Bacterium *Shewanella oneidensis* MR-1", *Chemistry of Materials* **2016**, published on-line Jan. 22, 2016.
- [310] Fu, Y. P.; Meng, F.; Rowley, M. B.; Thompson, B. J.; Shearer, M. J.; Ma, D. W.; Hamers, R. J.; Wright, J. C.; Jin, S. "Solution Growth of Single Crystal Methylammonium Lead Halide Perovskite Nanostructures for Optoelectronic and Photovoltaic Applications", *Journal of the American Chemical Society* **2015**, *137*, 5810-5818.
- [309] Merve Dogangun, Mimi N. Hang, Julianne M. Troiano, Alicia McGeachy, "Lasting Alteration of Compositional Membrane Asymmetry by LiCoO₂ Nanoplates", *ACS Nano* **2015**, *22*, 8755-8765..
- [308] Di Zhu, Jason A Bandy, Shuo Li, Robert J Hamers. "Amino-terminated diamond surfaces: Photoelectron emission and photocatalytic properties" *Surface Science* **2016**.
- [307] Jason A Bandy, Di Zhu, Robert J Hamers. Photocatalytic reduction of nitrogen to ammonia on diamond thin films grown on metallic substrates. *Diamond and Related Materials* **2016**
- [306] Zhang, X. W.; Meng, F.; Mao, S.; Ding, Q.; Shearer, M. J.; Faber, M. S.; Chen, J. H.; Hamers, R. J.; Jin, S. Amorphous MoS_xCl_y electrocatalyst supported by vertical graphene for efficient electrochemical and photoelectrochemical hydrogen generation. *Energy & Environmental Science* **2015**, *8*, 862-868.
- [305] Caroline R. English, Robert J. Hamers. "Molecular Electronic Effects on the Thermal Grafting of Aryl Iodides to TiO₂ Surfaces". *Journal of Physical Chemistry C* **2015**, *119*, 27972-27981.
- [304] Czech, K. J.; Thompson, B. J.; Kain, S.; Ding, Q.; Shearer, M. J.; Hamers, R. J.; Jin, S.; Wright, J. C. Measurement of Ultrafast Excitonic Dynamics of Few-Layer MoS₂ Using State-Selective Coherent Multidimensional Spectroscopy. *ACS Nano* **2015**, *9*, 12146-12157.
- [303] Qi Ding, Jianyuan Zhai, Miguel Caban-Acevedo, Melinda J. Shearer, Linsen Li, Hung-Chih Chang, Meng-Lin Tsai, Dewei Ma, Xingwang Zhang, Robert J. Hamers, Jr-Hau He, Song Jin. Designing Efficient Solar-Driven Hydrogen Evolution Photocathodes Using Semitransparent MoQ(x)Cl(y) (Q = S, Se) Catalysts on Si Micropyramids. *Advanced Materials* **2015**, *27*, 6511-+.
- [302] Catherine J. Murphy, Ariane Vartanian, Franz Geiger, Robert J. Hamers, Joel A. Pedersen, Qiang Cui, Christy Haynes, Erin Carlson, Rigoberto Hernandez, Rebecca Klaper, Galya Orr, Zeev Rosenzweig, Biological Resonances to Engineered Nanomaterials: Needs for the Next Decade", *ACS Central Science* **2015**, in press, published on-line at <http://pubs.acs.org/doi/abs/10.1021/acscentsci.5b00182>
- [301] Yongping Fu, Fei Meng, Matthew B. Rowley, Blaise J. Thompson, Melinda J. Shearer, Dewei Ma, Robert J Hamers, John C. Wright, and Song Jin, Solution Growth of Single Crystal Methylammonium Lead Halide Perovskite Nanostructures for Optoelectronic and Photovoltaic Applications, *Journal of the American Chemical Society* **2015**, *137*, 5810-5818.
- [300] Gustavo A. Dominguez, Samuel E. Lohse, Marco D. Torelli, Catherine J. Murphy, Robert J. Hamers, Galya Orr, and Rebecca D. Klaper, "Effects of Charge and Surface Ligand Properties of Nanoparticles on

- Oxidative Stress and Gene Expression with the Gut of *Daphnia magna*", Aquatic Toxicology **2015**, *162*, 1-9.
- [299] Leith Samad, Miguel Caban-Acevedo, M., Melinda J. Shearer, K. Park, Robert J. Hamers, and Song Jin, "Direct chemical vapor deposition synthesis of phase-pure iron pyrite (FeS₂) thin films", Chemistry of Materials **2015**, *27*, 3108-3114.
- [298] Lushuai Zhang, Susmit Roy, Caroline English, Robert Hamers, Michael Arnold, Trisha Andrew, "Observing Electron Extraction by Mono layer Graphene Using Time-Resolved Surface Photoresponse Measurements", ACS Nano **2015**, *9*, 2510-2517.
- [297] Z. Vivian Fenga, Ian L. Gunsolus, Tian A. Qiu, Katie R. Hurley, Lyle H. Nyberg, Hilena Frew, Kyle P. Johnson, Ariane M. Vartanian, Lisa M. Jacob, Samuel E. Lohse, Marco D. Torelli, Robert J. Hamers, Catherine J. Murphy, and Christy L. Haynes, "Impacts of Gold Nanoparticle Charge and Ligand Type on Surface Binding and Toxicity to Gram-Negative and Gram-Positive Bacteria", Chemical Sciences, **2015**, *6*, 5186-5196.
- [296] Lushuai Zhang, Susmit Singha Roy, Robert Hamers, Michael Arnold, Trisha Andrew, "Molecular Orientation-Dependent Interfacial Energetics and Built-in Voltage Tuned by a Template Graphene Monolayer", Journal of Physical Chemistry C **2015**, *119*, 45-54.
- [295] Miguel Cabán-Acevedo, Nicholas S. Kaiser, Caroline R. English, Dong Liang, Blaise J. Thompson, Hong-En Chen, Kyle J. Czech, John C. Wright, Robert J. Hamers, and Song Jin, "Ionization of High-Density Deep Donor Defect States Explains the Low Photovoltage of Iron Pyrite Single Crystals", Journal of the American Chemical Society **2014**, *136*, 17163-17179.
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U.S. Patents issued:

- 1) US Patent #5,268,621, "Digital Controller for Inchworm Piezoelectric Translators". R.J. Hamers, X. Chen, and M. McEllistrem.
- 2) U.S. Patent #5,908,692, "Controlled Organic Monolayers and Methods of Preparation Thereof", by R.J. Hamers, J.S. Hovis, and S. Lee, Issued June 1, 1999.
- 3) U.S. Patent #6,569,979, "Modified Carbon, Silicon, and Germanium Surfaces", T.C. Strother, L.M. Smith, and R.J. Hamers, inventors, Issued May 27, 2003.
- 4) US Patent#6,689,858, "Halogen-modified Surfaces of Silicon, Germanium, and Diamond", R.J. Hamers, W. Cai, L.M. Smith, T.C. Strother.

- 5) U.S. Patent #6,764,847, "Bacterial method for conversion of arsenite to arsenate", J.F. Banfield, T.M. Gihring, and R.J. Hamers, inventors.
- 6) US Patent #7,183,055 , "Direct radio-frequency detection of nucleotide hybridization at microelectrodes", D.W. van der Weide, R.J. Hamers, J.R. Peck, and W. Cai, inventors.
- 7) U.S. Patent #7,466,539, "Electrochemical double-layer capacitor using organosilicon electrolytes", V. Dementiev, R. West., R.J. Hamers, and K.Y. Tse, Issued Dec. 16, 2008. (Divisional application w/7,612,985)
- 8) U.S. Patent #7,612,985, "Electrochemical double-layer capacitor using organosilicon electrolytes", V. Dementiev, R. West., R.J. Hamers, and K.Y. Tse, Issued Nov. 3, 2009. (Divisional application w/7,466,539)
- 9) U.S. Patent # 7,704,362, "Apparatus for transport and analysis of particles using dielectrophoresis", Robert J. Hamers and Joseph D. Beck inventors, Issued April 27, 2010.
- 10) US Patent # 7,582,422, "Modified Carbon and Germanium Surfaces", Todd C. Strother, Lloyd M .Smith, and Robert J. Hamers, inventors, issued 2009. (This is a continuation in part of patent #3 above, extending claims from silicon to diamond and other forms of carbon).
- 11) U.S. Patent #8,093,177, "Molecular and biomolecular functionalization of metal oxides". Robert J. Hamers, Bo Li, Elizabeth C. Landis, and Ryan A. Franking. Patent issued January 10, 2012.
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- 14) U.S. Patent #8,986,532, "Methods and systems for the reduction of molecules using diamond as a photoreduction catalyst" R.J. Hamers and Di Zhu, inventors, patent filed by Wisconsin Alumni Research Foundation 2012. Patent issued March 24, 2015.

Patent Applications Submitted/In Process:

- 1) U.S. Patent Application, "Surface Plasmon Resonance Compatible Carbon Thin Films", Lloyd M. Smith, Matthew R. Lockett, Michael R. Shortreed, Robert M. Corn, Stephen Weibel, Robert J. Hamers, and Bin Sun, submitted 2010.
- 2) U.S. Patent Application, "High-temperature Resistant Carbon Monofluoride Batteries Having Lithiated Anode", R.J Hamers and J. Yeager, patent filed by Wisconsin Alumni Research Foundation 2012.
- 3) U.S. Patent Application, "Halogenated organosilicon electrolytes, methods of using them, and electrochemical devices containing them". Jose Adrian Pena Hueso, Jian Dong, Michael Pollina, Monica L. Usrey, Robert J. ahemrs, Robert C. West, David Osmalov, patent application filed Feb. 4, 2013.
R.J Hamers and J. Yeager, patent filed by Wisconsin Alumni Research Foundation 2012.
- 4) U.S. Patent Application, "Electrically polymerized surface layer for artificial solid-electrolyte interphase (SEI) layers on silicon and carbon-based electrodes", Patent application 20160020449.