Stanford



Gordon Brown

Bio

BIO

Gordon Brown specializes in environmental geochemistry and aqueous and surface geochemistry. He and his research group focus on chemical and microbiological interactions at environmental interfaces, which are defined as interfaces between solids and aqueous solutions, solids and gases, aqueous solutions and gases, solids and microbial organisms (including microbial biofilms), and solids and natural organic matter. They utilize molecular-scale methods, particularly those involving very intense x-rays from synchrotron radiation sources, to study the interactions of contaminants and pollutants, particularly heavy metals such as lead and mercury, metalloids such as arsenic and selenium, and actinides such as uranium, with mineral surfaces, with the aim of understanding reactions that can sequester or release these species or transform them into more or less toxic forms.

ACADEMIC APPOINTMENTS

- Member, Bio-X
- Affiliate, Stanford Woods Institute for the Environment

ADMINISTRATIVE APPOINTMENTS

- Postdoctoral Research Associate, State University of New York, Stony Brook, (1970-1971)
- Assistant Professor of Mineralogy and Crystallography, Princeton University, (1971-1973)
- Scientific Collaborator, Chemistry Department, Brookhaven National Laboratory, (1972-1973)
- Assistant Professor of Mineralogy and Crystallography, Stanford University, (1973-1977)
- Associate Professor of Mineralogy and Crystallography, Stanford University, (1977-1986)
- Visiting Faculty Fellow High Temperature Chemistry and Ceramics Division, Sandia National Laboratory, Albuquerque, New Mexico, (1983-1983)
- Visiting Professor, Universite Pierre et Marie Curie Paris VI, Laboratoire de Mineralogie-Cristallographie, (1984-1984)
- Professor of Mineralogy and Geochemistry, Stanford University, (1986- present)
- Chairman Geology Department, Stanford University, (1986-1992)
- Co-Director Center for Materials Research, Stanford University, (1987-1990)
- Professor of Photon Science, Photon Science Department, SLAC National Accelerator Laboratory, (1992- present)
- Acting Chair, Stanford Synchrotron Radiation Laboratory Faculty (now SLAC), (1997-1998)
- Chair Stanford Synchrotron Radiation Laboratory Faculty (now Department of Photon Science), SLAC National Accelerator Laboratory, (1998-2007)
- Director, Stanford Environmental Molecular Science Institute, Stanford University, (2004-2011)
- Professor (by courtesy) of Chemical Engineering, Stanford University, (2008- present)
- Chair, Department of Geological & Environmental Sciences, Stanford University, (2012- present)

HONORS AND AWARDS

- Graduate Traineeship, National Science Foundation (1965 – 1966)
- Graduate Fellow, National Defense Education Act (1966 – 1969)
- Fellow, Mineralogical Society of America (1975)
- French Government Fellowship as Professor associe, Universit Paris VI-VII (1984)
- Dorrell William Kirby Professor of Earth Sciences, Stanford University (1991 – Present)
- 24th Hallimond Lecturer, Mineralogical Society of Great Britain and Ireland (1992)
- Elected Vice President and President, Mineralogical Society of America (1994 - 1996)
- Docteur Honoris Causa, Universite Paris VII (1997)
- Fellow, Geological Society of America (1997)
- Edison Lecturer, University of Notre Dame (1999)
- Fellow, Geochemical Society (1999)
- Fellow, European Association of Geochemistry (1999)
- Best Paper Award 1999 (shared with G. Morin, F. Juillot, J. D. Ostergren, P. Ildefonse, G. Calas), Mineralogical Society of America (2000)
- Fellow, American Association for the Advancement of Science (2000)
- Umbgrove Lecturer, Utrecht University, The Netherlands (2000)
- Distinguished Lecturer, Distinguished Lecturer Series on Frontier Applications of Synchrotron Radiation, Cornell University (2004)
- Hawley Medal, Canadian Mineralogist (2006), shared: Farges, Siewert, Ponader, Pichavant, Behrens, Mineralogical Association of Canada (2007)
- Outstanding Paper Award (shared w/ Hayes, Roe, Hodgson, Leckie, Parks), Association of Environmental Engineering and Science Professors (2007)
- Patterson Medal, The Geochemical Society (2007)
- Roebling Medal,, Mineralogical Society of America (2007)
- Ian Campbell Medal,, American Geosciences Institute (2012)
- Elected Foreign Member, Academia Europaea (Earth and Cosmic Sciences Section) (2013)
- Louis T. J. Delbaere Memorial Lecturer:, Canadian Light Source Annual Users Meeting, Saskatoon, Saskatchewan, Canada. (2015)
- Award for Excellence in Teaching., Stanford School of Earth, Energy & Environmental Sciences (2016)
- Special Session in Honor of the Lifetime Contributions to the Geochemistry Community.,, Geochemical Society; Goldschmidt 17 Conference, Paris, Francs (2017)
- Honorary Doctorate of Science Degree, Millsaps College, Jackson, MS, (2018)
- Medal of Excellence in Mineralogical Sciences, International Mineralogical Association (2018)
- Elected Union Fellow, American Geophysical Union (2020)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Invited Talks, (1) “Interfaces in Environmental Chemistry: What Have We Learned in the Last 30 Years”, (2) “Interaction of Organic Molecules and Microorganisms with Mineral Surfaces and Their Impact on Metal Ion Sorption Processes”, (3) “Geochemistry of Mercury in Mining Environments”, Short Course on Computer Simulation and Synchrotron Radiation in Environmental Chemistry and Geochemistry”, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil, March 16-18, 2015. (2015 - 2015)
- Member, DOE-BESAC Subcommittee on Transformational Research Opportunities (2014 - present)
- Co-Organizer, Session on Interaction of Organic and Inorganic Pollutants With Mineral and Organic Surfaces, Goldschmidt Conference 2014, Sacramento, CA, June 2014. (2014 - 2014)
- Invited Lecturer and Co-Convenor, “The Expanding Role of Large User Facilities in the Earth Sciences and the New Research Opportunities They Create”, Union Session on Elements: 10 Years Old, Goldschmidt Conference 2014, Sacramento, CA, June 2014. (2014 - 2014)

- Invited Talk, “Interaction of Engineered and Natural Nanoparticles (NPs) at Solid-water, Solid-Organic Matter, and Solid-Microbe Interfaces”, Session on Engineered Nanomaterials Interacting with Natural and Engineered Interfaces, Division of Colloid and Surface Chemistry, 248th American Chemical Society Meeting, San Francisco, CA, August 12, 2014. (2014 - 2014)
- Invited Talk, “Synchrotrons and the Environment – A Marriage Made in Heaven”, Synchrotron Environmental Science VI, Advanced Photon Source, Argonne, IL, September 11-12, 2014. (2014 - 2014)
- Invited Talk, “Properties, Health Impacts, and Transformations of Engineered, Incidental, and Natural Nanoparticles”, International Conference on Nanoscience and the Environment, Center of Competences Nanosciences in Ile de France (C'Nano IdF, http://www.cnanoidf.org), Paris, France, November 6, 2014. (2014 - 2014)
- Plenary Lecture, "Interface Chemistry and Geochemistry: What Have We Learned in the Last 30 Years?", Conference on the Chemical Side of SLU2+, Swedish University of Agricultural Sciences, Uppsala, Sweden, August 19-21, 2014. (2014 - 2014)
- Member, Science Advisory Board, Blue Planet Ltd. (2013 - present)
- Member, University Committee on Environmental Health & Safety, Stanford University (2013 - present)
- Principal Editor, Elements Magazine (2013 - present)
- Invited Lecturer, ”Applications of XAFS Spectroscopy to Molecular Environmental Science”, SLAC National Accelerator Laboratory Summer School on Applications of Synchrotron X-ray Absorption Spectroscopy, SLAC National Accelerator Laboratory, June (2013 - 2013)
- Invited Speaker, IMPMC, U.Paris VI-VII: Uranium Speciation in Contaminated Sediments, March 2007. (2013 - 2013)
- Invited Talk, “Environmental Geochemistry of the Light Actinides” Institut de Minéralogie et de Physique des Milieux Condensés (IMPMC), Universite Paris VI, Paris, France, June (2013 - 2013)
- Invited Talk, “Mineral-aqueous solution interfacial processes and their impact on the environment". 2013 Gordon Research Conference on Chemical Reactions on Surfaces. Les Diablerets, Switzerland, April (2013 - 2013)
- Invited Talk, “Mineral-Aqueous Solution Interface Reactions and Their Impact on the Environment”, Frontiers in Geosciences Seminar Series. Earth and Environmental Sciences Division, Los Alamos National Laboratory, Los Alamos, NM, July (2013 - 2013)
- Invited Talk, “Mineral-aqueous solution interfacial processes and their impact on the environment.” U.S.G.S. Western Region Colloquium, Menlo Park, CA, May (2013 - 2013)
- Invited Talk, “Mineral-Aqueous Solution Interface Reactions and Their Impact on the Environment”, Centre Européen de Recherche et d’Enseignement des Géosciences de l’Environnement (CEREGE), Universite Aix-Marseilles, Aix-in-Provence, France, June (2013 - 2013)
- Invited Talk, “Factors Controlling Chemical Reactions at Environmental Interfaces”, Session on Behavior of Contaminants at Environmental Interfaces, Division of Colloid and Surface Chemistry, 246th American Chemical Society Meeting, Indianapolis, IN, September (2013 - 2013)
- Invited Talk and Co-Organizer, “Molecular Characterization of Natural Organic Matter”, Workshop on Belowground Carbon Cycling Processes at the Molecular Scale, Environmental Molecular Science Laboratory, Pacific Northwest National Lab, Richland, WA, February (2013 - 2013)
- Keynote Speaker, “Beneficial Uses of Engineered Nanoparticles and the Behavior of Natural and Engineered Nanoparticles in the Environment", Session on Environmental Application of Engineered Nanomaterials: Benefits and Risks. In Theme on Anthropogenic Impacts on Pollutant Dynamics, Goldschmidt 2013 Conference, Florence, Italy, August (2013 - 2013)
- Lead, Task on Complex Environmental Interfaces under Realistic Conditions, SLAC Initiative on Controlling Chemical Reactivity for Energy and the Environment (2013 - 2013)
- Member, Geological Society of America Geology and Public Policy Committee (2013 - 2013)
- Member, DOE - BESAC Sub-Committee on Synchrotron Light Sources (2013 - 2013)
- Member, DOE - Basic Energy Sciences Advisory Committee (BESAC) Sub-Committee on Major Facilities (2013 - 2013)
- Member, Committee on Synchrotron Light Sources, National Science Foundation Mathematics and Physical Science Directorate (2013 - 2013)
- Smith Lecturer, "Mineral-Aqueous Solution Interfacial Processes and Their Impact on the Environment". Department of Earth and Environmental Sciences, University of Michigan, Ann Arbor, MI, March (2013 - 2013)
- Invited Talk, “Probing Environmental Nanoparticles and Chemical Reactions at Solid-Water-Microbial Biofilm Interfaces with Synchrotron Light.” Synchrotron Soleil – French National Synchrotron Facility Seminar, Gif-sur-Yvette, France, May (2012 - 2012)
- Invited Talk, "Mesoscale Phenomena Associated with Mineral Surfaces and Pathway-Dependent Chemical Processes." Session on Earth Materials at the Mesoscale: Characterization and Applications. American Geoophysical Union Meeting, San Francisco, CA, December (2012 - 2012)
- Organizer, Session on “Surface Adsorption and Reaction Processes of Nanomaterials Relevant to Environmental Science.” Division of Colloid and Surface Science, 243rd American Chemical Society National Meeting, San Diego, CA, March (2012 - 2012)
- Member, Basic Energy Sciences Advisory Committee, Department of Energy (2011 - present)
- Member, Basic Energy Sciences Advisory Committee Subcommittee on Mesoscale Science & Engineering, Department of Energy (2011 - 2013)
- Co-Organizer (with Georges Calas, Univerisity of Paris 6), Session on Actinides in the Environment, AGU Fall National Meeting, San Francisco, CA, December (2011 - 2011)

- Invited Speaker, NSF Chemistry Workshop on Nanomaterials and the Environment: “Surface Adsorption and Reaction Processes Relevant to Environmental Science” and “Infrastructure and Human Resources Needs in Nano/Environmental Science: Computational Tools”, Arlington, VA, June (2011 - 2011)
- Keynote Speaker, Session on Chemical and Microbial Electron Transfer Processes at Mineral Surfaces, Goldschmidt 2011 Conference: “Element Attachment and Electron Transfer Reactions at Mineral-Water and Mineral-Microbe Interfaces”, Prague, The Czech Republic, August (2011 - 2011)
- Member, Organizing Committee, NSF Chemistry Workshop on "Nanomaterials and the Environment: The Role of Chemists", Arlington, VA, June 28-30 (2011 - 2011)
- Member, Provost's Committee on Postdoctoral Students, Stanford University (2010 - present)
- Invited Speaker, Symposium on Spectroscopic Investigations of Metal Interactions at Mineral/Water/Microbial Interfaces: “Spectroscopic Investigations of Metal Ion Interactions with Mineral Surfaces – What Have We Learned in the Last 30 Years?”, 239th American Chemical Society Meeting, San Francisco, CA, March (2010 - 2010)
- Invited Speaker, Symposium on Environmental Interfaces, 57th Annual American Vacuum Society Meeting: “Environmental Interfaces: Where the Vacuum, Cleanliness, and Size Gaps Must be Minimized”, Albuquerque, NM, October 2010. (2010 - 2010)
- Invited Speaker, Symposium on Environmental Implications of Nanotechnology, PacifiChem Meeting: “Structure and Reactivity of Silver and Iron Oxide Nanoparticles”, Honolulu, HI, December 2010. (2010 - 2010)
- Invited Speaker, Session on Biotic and Abiotic Transformations and Effects of Manufactured Nanomaterials – Fundamental Environmental Aspects, Goldschmidt 2010 Conference: “Sulfidation of Silver Nanoparticles”, Knoxville, TN, June 2010. (2010 - 2010)
- Affiliated Faculty, Woods Institute for the Environment, Stanford University (2009 - present)
- Co-Chair, Science Theme Advisory Panel on Geochemistry, Biogeochemistry, and Subsurface Science, Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory (2009 - 2010)
- Co-Organizer (with Abby Kavner, UCLA; Nancy Ross, Virginia Tech; Glenn Waychunas, LBNL), Mineralogical Society of America Symposium on “Frontiers in Mineral Sciences: Mineral/Melt Energetics, Mineral Surface Chemistry, Mineral Nanoscience, and High Pressure Mineralogy,” Geological Society of America Annual Meeting, Portland, OR, October (2009 - 2009)
- Co-Organizer (with Janet Hering, ETH), Session on “Mineral/Water Interface Chemistry: The Legacy of Stumm and Schindler and What We Have Learned Since,” 2009 | Goldschmidt Conference, Davos, Switzerland, June (2009 - 2009)
- Co-Organizer and Invited Speaker (with Georges Calas, University of Paris 6), Symposium on Environmental Mineralogy, French Academy of Sciences, Institut de France: “Environmental Mineralogy – Molecular-level Perspectives”, Paris, France, September (2009 - 2009)
- Discussion Leader, Gordon Research Conference on Chemical Reactions at Surfaces, Session on “Environmental Surface Chemistry”, Ventura, CA, February (2009 - 2009)
- Invited Speaker, Center for Environmental Implications of Nanotechnology Annual Meeting: “Surface Science Studies of Iron Oxide and Silver Nanoparticles”, Washington, DC, September (2009 - 2009)
- Invited Speaker, Symposium on Metal and Metalloid Speciation and Adsorption: “Interaction of Zn(II) with Mineral Nano- and Microparticles, Bacterial Surfaces, and Biofilm-Coated Metal Oxides”, 237th American Chemical Society National Meeting, Salt Lake City, UT, March (2009 - 2009)
- Invited Speaker, Department of Earth and Planetary Sciences Seminar: “Mercury Pollution in California - From Subduction to Mercury in Tuna”, Washington University St. Louis, April (2009 - 2009)
- Invited Speaker, San Jose State University Geology Club: “From Subduction to Mercury in Tuna: The Legacy of Mercury and Gold Mining in California”, San Jose, CA, November (2009 - 2009)
- Invited Speaker, Department of Earth & Environmental Sciences, Ludwig-Maximilians-Universität: “Applications of Synchrotron Radiation in the Earth, Environmental, and Energy Sciences”, Munich, Germany, June (2009 - 2009)
- Member, Stanford Faculty Senate, Stanford University (2009 - 2009)
- Member, Proposal Review Panel, Geobiology and Low Temperature Geochemistry Program, Earth Sciences Division, National Science Foundation 2008 Keynote Speaker: Beveridge Symposium on the Interaction of Metal Ions with Bacteria: “Synchrotron X-ray Studies of Bacteria-Mineral-Metal Ion Interactions”, Goldschmidt Conference, Vancouver, British Columbia, Canada, July (2008 - 2009)
- Co-Organizer, Session on Nanoparticles in the Environment, American Geophysical Union Fall Meeting, San Francisco, CA, December (2008 - 2008)
- Invited Participant, DOE-BES Workshop on Solving Science and Energy Grand Challenges with Next Generation Photon Sources, Rockville, MD, October (2008 - 2008)
- Invited Speaker, Department of Civil & Environmental Engineering Seminar Series, U.C. Berkeley: “Shedding New Light on Environmental Chemistry and Environmental Microbiology: Synchrotron-Based Studies of Complex Environmental Processes”, Berkeley, CA, September (2008 - 2008)
- Invited Speaker, Cross-Cutting Review of Environmental Science at the Advanced Light Source, Lawrence Berkeley National Laboratory: “STXM Studies of Nanoscale Environmental and Geological Materials and Processes”, Berkeley, CA, October (2008 - 2008)
- Invited Speaker, Institute Seminar, EAWAG, Swiss Federal Institute of Aquatic Science & Technology: “Mercury Pollution in California – From Subduction to Mercury in Tuna”, Dübendorf, Switzerland, November (2008 - 2008)

- Invited Speaker, Louisiana State University Office of Research and Economic Development Workshop - Enabling Grand Challenge Science: The Light Source of the Future, “A Case for Environmental Science at the ‘Next Generation’ Light Source”, Baton Rouge, LA, January (2008 - 2008)
- Invited Speaker, Geochemistry Division Symposium on Advanced Approaches to Investigating Adsorption at the Solid-Water Interface: “Factors Controlling the Reactivity of Metal Oxide Surfaces”, American Chemical Society 235th National Meeting, New Orleans, LA, April (2008 - 2008)
- Invited Speaker, Department of Environmental Science Seminar: “Microbial and Chemical Interactions at Mineral Surfaces and Their Impact on Trace Element Cycling”, ETH-Zurich, Zurich, Switzerland, November (2008 - 2008)
- Invited Speaker, Stanford-Berkeley Summer School in Applications of Synchrotron Radiation in the Physical Sciences: “Applications of Synchrotron Radiation in the Environmental Sciences”, Stanford Linear Accelerator Center and Stanford University, Stanford, CA, August (2008 - 2008)
- Invited Speaker, U.C. Berkeley Workshop on Imaging Complex Pore Structure of Cement: “ Synchrotron X-ray Spectromicroscopy Studies of Minerals and Biominerals in Complex, Multi-phase Samples”, Berkeley, CA, April (2008 - 2008)
- Member, External Review Committee, Geosciences, Environmental Sciences, and Planetary Sciences Programs, Advanced Photon Source, Argonne National Laboratory (2008 - 2008)
- Member, School of Earth Sciences Council, Stanford University (2007 - present)
- Member: SLAC Faculty Task Force, Stanford University (2007 - present)
- Member, Science Advisory Board, Calera Corporation, Cupertino, CA (2007 - 2012)
- Member: GES Graduate Admissions Committee, Stanford University (2007 - 2012)
- Co-Chair, Task Force Team on Materials, Energy, Environment, and Techology, SLAC, Stanford University (2007 - 2008)
- Member, Junior Faculty Search Committee, Dept. of Chemical Engineering, Stanford University (2007 - 2008)
- Member, SLAC Strategic Planning Committee, DOE Contract Competition, SLAC, Stanford University (2007 - 2008)
- Co-Organizer, SSRL Workshop on STXM and X-ray Nanoprobe Capabilities and Needs for Geological, Environmental, and Biological Sciences, Stanford University, July 2007. (2007 - 2007)
- Invited Lecturer and Participant, DOE Workshop on Molecular Dynamics and Structure of Geofluids, Claremont Resort, Berkeley, CA (2007 - 2007)
- Invited Speaker, The Future of X-ray Science – A symposium in honor or Prof. Joachim Stohr, Director of SSRL, on his 60th birthday, “Molecular Environmental and Interface Science - Applications of Synchrotron X-rays to Pollutants and Their Interactions at Environmental Interfaces”, SLAC, Stanford, CA, September 2007. (2007 - 2007)
- Invited Speaker, Goldschmidt Conference, Symposium on Speciation and Reactivity of Trace Elements in Natural Environments, Mercury Speciation in Mining Environments, Cologne, Germany, August 2007. (2007 - 2007)
- Invited Speaker, 1st ERA-Chemistry Flash Conference: Factors Controlling Chemical Reactivity at Metal Oxide-Aqueous Solution Interfaces, Autrans, France, March 2007. (2007 - 2007)
- Invited Speaker, Department of Chemistry Seminar, University of Paris VI: Factors Controlling Chemical Reactivity at Metal Oxide-Aqueous Solution Interfaces, Paris, France, March 2007. (2007 - 2007)
- Invited Speaker, The FYSICUM, Stockholm University: Molecular Environmental Science-Applications of Synchrotron Radiation to Environmental Problems at the Molecular Level, Stockholm, Sweden, March 2007. (2007 - 2007)
- Invited Speaker, Workshop on Colloidal Ceramic Processing - The Role of Interfaces, University of Melbourne: Reactivity of Hematite Nanoparticles in the Presence of Zn(II)aq and Shewanella oneidensis, Melbourne, Australia, February 2007. (2007 - 2007)
- Invited Speaker, Glen T. Seaborg Institute for Transactinium Science Seminar Series, Lawrence Berkeley National Laboratory: Uranium Speciation in Contaminated Sediments: XAFS Studies of Model and Natural Systems, Berkeley, CA, January 2007 (2007 - 2007)
- Invited Speaker:, Hudnall Symposium in Memory of Prof. Joseph V. Smith, “Applications of Synchrotron Radiation to Earth Materials”, Department of the Geophysical Sciences, University of Chicago, Chicago, IL, October 2007. (2007 - 2007)
- Keynote Speaker, Australian Colloid and Interface Symposium - Inorganic Oxide Surfaces, Factors Controlling the Reactivity of Metal Oxide Surfaces, Sydney, Australia, February 2007. (2007 - 2007)
- Member, Committee on Committees, Mineralogical Society of America 2007 | Keynote Speaker: Frontiers in Mineral Sciences 2007 Conference: Interaction of Organic Molecules and Microorganisms with Mineral Surfaces and Their Impact on Metal Ion Sorption Processes, Cambridge, U.K., June 2007. (2007 - 2007)
- Member, External Review Committee, Chemistry and Forensics Review, Los Alamos National Laboratory, Los Alamos, NM (2007 - 2007)
- Participant and Discussion Leader, 2007 EnviroSync DOE Workshop: Assessing Synchrotron Radiation Capabilities and Future Needs for Molecular Environmental Science and Low Temperature Geochemistry, Rockville, MD, July 2007. (2007 - 2007)
- Plenary Lecturer, 12th International Symposium on Water-Rock Interaction: Recent Advances in Surface, Interface, and Environmental Geochemistry, Kunming, China, August 2007. (2007 - 2007)
- Plenary Lecturer, Goldschmidt Conference, Patterson Medal Lecture, A Geochemists View of the Environment from the Molecular Perspective, Cologne, Germany, August 2007. (2007 - 2007)

- Third Roebling Medallist Lecturer, “Reminiscences of a Mineralogist Who Went Astray”, Geological Society of America Annual Meeting, Denver, CO, October 2007 (2007 - 2007)
- Member, Search Committee, Senior Faculty Position in Molecular Theory, Photon Science Department, SLAC, Stanford University (2006 - 2009)
- Invited Speaker, Workshop on the Development of New User Research Capabilities in Environmental Molecular Science: Stanford EMSI - Current and Future Research Efforts, W.R. Wiley Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, WA, August 2006. (2006 - 2006)
- Invited Speaker, 232nd American Chemical Society National Meeting, Division of Colloid and Surface Chemistry Symposium on Environmental Interfaces, Soft X-ray Spectroscopy Studies of Environmental Interfaces, San Francisco, CA, September 2006. (2006 - 2006)
- Invited Speaker, Stanford Vice Provost for Undergraduate Education Seminar Series in Earth Sciences: Mercury in the Environment, Stanford University, July 2006. (2006 - 2006)
- Invited Speaker, Department of Chemstry Seminar, Autonomous University of Barcelona, "Environmental Interfaces, Heavy Metals, Microbes, and Plants: Shedding New Light on Environmental Science at the Molecular Level", Barcelona, Spain, April 2006 (2006 - 2006)
- Invited Speaker, Stanford-Berkeley Summer School in Applications of Synchrotron Radiation in the Physical Sciences, Interfaces, Heavy Metals, Microbes, and Plants: Shedding New Light on Environmental Science at the Molecular Level, U.C. Berkeley, June 2006 (2006 - 2006)
- Invited Speaker, NSF Workshop on Preparing for an Academic Career in the Geosciences, Stanford Environmental Molecular Science Institute Overview, Stanford University, July 2006. (2006 - 2006)
- Invited Speaker, Energy Recovery Linac Workshop on Frontier Applications of X-ray Science in Biology, Applications of X-ray Absorption Spectroscopy in Microbial Biomineralization, Cornell University, Ithaca, NY, June 2006. (2006 - 2006)
- Keynote Speaker, Annual Meeting of the Center for Environmental Molecular Science, Stony Brook University: Chemical and Microbial Processes at Environmental Interfaces - From Molecular to Field Scales, Stony Brook, NY, November 2006. 2005 Invited Speaker: Department of Materials Science and Engineering Seminar Series, Stanford University, X-ray Spectroscopy and Microscopy Studies of Chemical and Biological Processes at Environmental Interfaces, Stanford, CA, January 2005 (2006 - 2006)
- Member, DOE Chemical Sciences Division Program Review Committee, Chemistry Division, Argonne National Laboratory, March 2006 (2006 - 2006)
- Member, Science Advisory Council, Sincrotrone Trieste, ELETTRA, Trieste, Italy (2005 - 2012)
- Member, International Program Committee, XAFS13, 13th International Meeting on X-ray Absorption Fine Structure Spectroscopy, Stanford, CA (2005 - 2006)
- Member, Local Organizing Committee, XAFS 13 (2005 - 2006)
- Chair, Stanford Synchrotron Radiation Laboratory Director Search Committee, SLAC, Stanford University (2005 - 2005)
- Invited Speaker, Stanford-Berkeley Summer School in Applications of Synchrotron Radiation in the Physical Sciences, Interfaces, Heavy Metals, Microbes, and Plants: Shedding New Light on Environmental Science at the Molecular Levelî, SLAC, June 2005. (2005 - 2005)
- Invited Speaker, Chemistry Department Seminar Series, U.C. Irvine, Chemical and Biological Processes at Environmental Interfaces - A Reductionist Approach Using Synchrotron Radiation Methods, Irvine, CA, February 2005. (2005 - 2005)
- Invited Speaker, Symposium on Research, Education, and Outreach in the NSF Environmental Molecular Science Institutes, 230th American Chemical Society Meeting, ìResearch Overview of the Stanford EMSIî, Washington, DC, August 2005. (2005 - 2005)
- Invited Speaker, Bancroft Symposium, 88th Canadian Chemistry Conference, Synchrotron Radiation Studies of Environmental Interfaces, Saskatoon, Saskatchewan, May 2005. (2005 - 2005)
- Invited Speaker, Symposium on Applications of Physical Chemistry to Environmental and Biogeochemical Research, 229th American Chemical Society National Meeting, The Role of Organic Molecules and Microbial Organisms in Metal Ion Sorption Processes, San Diego, CA, March 2005. (2005 - 2005)
- Invited Speaker, Symposium on Environmental Interfaces, American Physical Society March Meeting, Chemical Reactivity at Metal Oxide-Aqueous Solution Interfaces, Los Angeles, CA, March 2005. (2005 - 2005)
- Invited Speaker, Robinson Environmental Theme Dormitory Seminar Series, Stanford University, Exploring Environmental Science Issues at the Molecular Level, Stanford, CA, March 2005. (2005 - 2005)
- Invited Speaker, Los Alamos National Lab Workshop on Addressing National Security Needs at DOE User Laboratories - Determining Structure-Function Relationships in Security-Relevant Materials, (1) Molecular Environmental Science: An Example of Applied Science at the User Facilities; (2) Research Opportunities at SSRL Relevant to National Security, Los Alamos, NM, February 2005. (2005 - 2005)
- Invited Speaker, Stanford-Berkeley Summer School in Applications of Synchrotron Radiation in the Physical Sciences, Interfaces, Heavy Metals, Microbes, and Plants: Shedding New Light on Environmental Science at the Molecular Level, SLAC, June 2005. (2005 - 2005)
- Invited Speaker, DOE Review and Site Visit of SSRL, Molecular Environmental and Interface Science Research at SSRLî, SLAC, Menlo Park, CA, January 2005 (2005 - 2005)
- Invited Speaker, Environmental Mineralogy Seminar Studies at the Molecular Level, Molecular-Level Studies of Chemical and Biological Interactions at Iron and Aluminum Oxide Surfacesî, Universite de Grenoble, Grenoble, France, October 2005. (2005 - 2005)

- Plenary Speaker, Synchrotron Environmental Science III, Synchrotron Environmental Science: What Have We Accomplished and What Lies Ahead?, Brookhaven National Laboratory, Upton, NY, September, 2005. (2005 - 2005)
- Plenary Speaker, Workshop on In-Situ Characterization of Surface and Interface Structures and Processes, Argonne National Laboratory, Synchrotron-Based Studies of Environmental Surfaces, Interfaces, and Reactionsî, Argonne, IL, September 2005. (2005 - 2005)
- Member, Science Advisory Committee, Center for Advanced Microstructures and Devices, Lousiana State University, Baton Rouge, LA (2004 - 2008)
- 2004 – 2006 | Member, Search Committee, Junior Faculty Position in X-ray Imaging and Ultra-Fast Scattering, SSRL Faculty, Stanford University (2004 - 2006)
- Chair, Committee of Visitors, Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Sciences, Department of Eneregy (2004 - 2005)
- Member, Search Committee in Chemical Engineering for New Faculty Member in Heterogeneous Catalysis, Stanford University (2004 - 2005)
- Invited Speaker, Symposium on Synchrotron Radiation as a Frontier Multidisciplinary Scientific Tool, American Association for the Advancement of Science Annual Meeting, Shedding New Light on Environmental Problems: Applications of Synchrotron Radiation to Environmental Science at the Molecular Level, Seattle, WA, February 2004; (2004 - 2004)
- Invited Speaker, Environmental Protection Agency STAR Mercury Program Final Review, Processes Controlling the Chemical/Isotopic speciation and Distribution of Mercury from Contaminated Mine Wastes, Washington, DC, November 2003; (2004 - 2004)
- Keynote Speaker, 7th Annual Environmental Chemistry Symposium, Pennsylvania State University Center for Environmental Chemistry and Geochemistry, From Subduction to Mercury in Tuna: Hg Mining and Contamination in the California Coast Range, USA and Environmental Interfaces, Heavy Metals, Microbes, and Plants: Applications of Synchrotron Radiation Methods to Environmental Science at the Molecular Level, University Park, PA, March 2004; (2004 - 2004)
- Member, Visiting Committee, Carnegie Institution of Washington, Geophysical Laboratory (2004 - 2004)
- Member, Science Advisory Committee, Environmental Molecular Science Laboratory, Pacific Northwest National Laboratory (2003 - present)
- Chair, Core Disciplines Subcommittee, School of Earth Sciences, Stanford University (2003 - 2004)
- Member, Grants Committee, Stanford Institute for the Environment, Stanford University (2003 - 2004)
- Invited Speaker, University of Paris VI-VII: From Subduction to Mercury in Tuna: Hg Mining and Contamination in the California Coast Range, USA, Paris, France, June 2003; (2003 - 2003)
- Invited Speaker, Berkeley-Stanford Summer School on Synchrotron Radiation and Its Applications: Applications of Synchrotron Radiation in Environmental Science, Berkeley, CA, June 2003; (2003 - 2003)
- Invited Speaker, Mesilla Chemistry Workshop on Environmental Chemistry at Interfaces: Advances through Molecular-Level Insight: Approaching the Complexity of Natural Environmental Interfaces: Spectroscopic Studies of Aqueous Metal and Metalloid Reactions with Biofilm-Coated Metal Oxides, Mesilla, NM, February 2003; (2003 - 2003)
- Invited Speaker, Department of Geology and Geophysics Seminar Series, Yale University, From Subduction to Mercury in Tuna: Hg Mining and Contamination in the California Coast Range, USAî, New Haven, CN, November 2003 (2003 - 2003)
- Invited Speaker, DOE Geosciences Program Principal Investigator Symposium on Surficial Geochemical Processes: Sorption Reactions at Mineral-Water Interfaces: X-ray Spectroscopy/Scattering Studies of Sorption Complex Geometries, Surface Structure, and Reactivity, Effects of Organic and Inorganic Ligands, and Complex Natural Samples, Argonne National Laboratory, Argonne, IL, March 2003; (2003 - 2003)
- Member (and Chair of X-ray and Neutron Science Subcommittee), Committee of Visitors, Materials Science and Engineering Division, Basic Energy Sciences, Department of Energy (2003 - 2003)
- Plenary Lecturer, XAFS12 12th International Conference on X-ray Absorption Spectroscopy: Environmental Interfaces, Heavy Metals, Microbes, and Plants: Applications of XAFS Spectroscopy and Related Synchrotron Radiation Methods to Environmental Science, Malm, Sweden, June 2003; (2003 - 2003)
- Plenary Science Lecture, American Chemical Society 225th National Meeting, Symposium on Synchrotron-Based Analytical Techniques for Nuclear and Environmental Sciences: Overview of Applications of Synchrotron-Based Techniques in Environmental and Nuclear Science, New Orleans, LA, March 2003; (2003 - 2003)
- Chair, Search Committee for Geomicrobiology Faculty Position, Stanford University (2002 - 2003)
- Invited Lecturer, Berkeley-Stanford Summer School on Synchrotron Radiation and Its Applications: Applications of Synchrotron Radiation in Environmental Science, Stanford, CA, July 2002; (2002 - 2002)
- Invited Lecturer, Mineralogical Society of America-Geochemical Society Short Course on Applications of Synchrotron Radiation to Low Temperature Geochemistry and Environmental Science: Overview of Applications to Low Temperature Geochemistry and Environmental Science, Monterey, CA, December 2002; (2002 - 2002)
- Invited Participant, National Academy of Sciences-National Research Council Workshop on Environmental Chemistry, Irvine, CA (Nov. 2002) (2002 - 2002)
- Invited Speaker, American Geophysical Union Fall Meeting, Union Session on National Facilities in the Earth Sciences:Overview of Applications to Low Temperature Geochemistry and Environmental Science, San Francisco, CA, December 2002. (2002 - 2002)

- Invited Speaker, Spectroscopic Characterization of Speciation and Chemistry on Mineral Surfaces, Symposium on Chemistry and the Environment in the 21st Century - Session on Environmental Chemistry at Interfaces, 223rd National Meeting of the American Chemical Society, Orlando, FL, April 2002; (2002 - 2002)
- Member, NSF Advisory Committee on Government Performance and Assessment (GPRA) Performance Assessment (2002 - 2002)
- Panel Member, Chemistry Division, National Science Foundation, Collaborative Research in Chemistry Panel (2002 - 2002)
- Invited Lecturer, Berkeley-Stanford Summer School on Synchrotron Radiation and Its Applications, Berkeley, CA; Symposium on Establishing a National Synchrotron Light Research Facility in Israel, SLAC, Stanford University; Departmental Seminar Series, Dept. of Earth and Space Sciences, University of Washington, Seattle, WA. (2001 - 2001)
- Invited Speaker, Second International Workshop on Oxide Surfaces, Taos, NM; Session on Advances in the Development and Application for In Situ Techniques for the Investigation of Geochemical Systems, Goldschmidt Conference, The Homestead, Hot Springs, VA; (2001 - 2001)
- Keynote Speaker, Session on Environmental Mineralogy and Geochemistry The Molecular Environmental Science Perspective, European Union of Geosciences Meeting, Strasbourg, France; (2001 - 2001)
- Member, External Review Committee, Columbia University NSF-DOE-Environmental Molecular Sciences Institute (2001 - 2001)
- Plenary Lecture, UK Natural Environment Research Council Workshop on Unlocking the Potential of DIAMOND and SOLIEL for Environmental Sciences, Strasbourg, France; Workshop on Molecular Environmental Science and Soft X-ray Sources, Lawrence Berkeley National Laboratory, Berkeley, CA; (2001 - 2001)
- Member, University Committee on Land and Building Development, Stanford University (2000 - 2003)
- Chair, GES Graduate Admissions Committee, Stanford University (2000 - 2001)
- Invited Speaker, Univ of Saskatchewan & Can. Light Source; DOE Wkshop, Soft X-Ray Sci Next Millennium, Pikeville, TN (2000 - 2000)
- Invited Speaker, SLAC High Energy Physics Symposium, Stanford Linear Accelerator Center, Stanford, CA; Environmental Science, Engineering, and Policy in the 21st Century Distinguished Lecture Series, University of Michigan, Ann Arbor, MI (2000 - 2000)
- Invited Speaker, Advanced Light Source Division Seminars, Lawrence Berkeley National Laboratory, Berkeley, CA; (2000 - 2000)
- Member, Advisory Board, NSF EPSCoR Interface Science Center, University of Nevada, Las Vegas (2000 - 2000)
- Participant, American Academy of Microbiology Workshop on Geobiology, Tuscon, AZ (2000 - 2000)
- Plenary Lecture, 2nd Euroconference and NEA Workshop on Speciation, Techniques, and Facilities for Radioactive Materials at Synchrotron Light Sources, Grenoble, France (2000 - 2000)
- Plenary Lecturer, Users Meeting, Advanced Photon Source, Argonne National Laboratory, Argonne, IL; (2000 - 2000)
- Umbgrove Lecturer, Utrecht University, The Netherlands; (2000 - 2000)
- Member (Chair, 2002), MSA Distinguished Public Serve Award Committee (1999 - 2002)
- Member: Facility Advisory Committee, Canadian Light Source (1999 - 2001)
- Co-Chair, GES Research Infrastructure Committee, Stanford University (1999 - 2000)
- Edison Lecturer, Department of Civil Engineering and Geological Sciences, University of Notre Dame, South Bend, IN (1999 - 1999)
- Invited Lecturer, DOE-BES Geosciences Research Symposium VI: Interfacial Processes, Pacific Northwest National Laboratory, Richland, WA (1999 - 1999)
- Invited Lecturer, Invited Lecture: 6th International Conference on the Structure of Surfaces (ICSOS-6), Vancouver, B.C., Canada; (1999 - 1999)
- Invited Lecturer, Corning Science Fellows Conference, Corning, NY; Invited Lecture: Mineralogy at the Millenium Symposium, Carnegie Institution of Washington, Geophysical Laboratory; New Opportunities in Molecular Environmental Science, Science Policy Committee Meeting, Stanford Linear Accelerator Center (1999 - 1999)
- Invited Speaker, NSF/DOE Chemistry Workshop, Molecular Energy & Env Science, Chicago, IL; (1999 - 1999)
- Invited Speaker, NSF Earth Sciences Workshop on Mineral and Rock Physics and Earth Materials, Scottsdale, AZ (1999 - 1999)
- Invited Speaker, Krauskopf Symposium, Stanford University, Stanford, CA; Invited Speaker: Gibbs Symposium, American Geophysical Union Fall Meeting, San Francisco, CA (1999 - 1999)
- Keynote Speaker, Chemistry on Oxides Session, 46th American Vacuum Society International Symposium, Seattle, WA (1999 - 1999)
- Keynote Speaker, ACS Symposium on Interfacial and Colloidal Phenomena in Aquatic Environments, Environmental Chemistry Division, 217th American Chemical Society National Meeting, Anaheim, CA (1999 - 1999)
- Keynote Speaker, Synchrotron Environmental Science Conference, Argonne National Laboratory, Argonne, IL (1999 - 1999)
- Member, Search Committee, Ion Microprobe Faculty Position, Stanford University (1999 - 1999)

- Participant, NSF/DOE Chemistry Workshop on Energy and Environmental Science (1999 - 1999)
- Participant, NSF Earth Sciences Workshop on Mineral and Rock Physics and Earth Materials (1999 - 1999)
- Plenary Lecture, ACS Symposium on First Accomplishments of the Environmental Management Science Program, Nuclear Chemistry Division, 218th American Chemical Society National Meeting, New Orleans, LA (1999 - 1999)
- Plenary Lecturer, NRCan Light Source Synchrotron Workshop, Ottawa, Canada (1999 - 1999)
- Chair, Stanford Synchrotron Radiation Laboratory Faculty, SLAC, Stanford University (1998 - 2007)
- Co-Chair, EnviroSync, A National Organization of Environmental Science Users of U.S. Synchrotron Radiation Sources (1998 - 2004)
- Chair, Search Committee for Two Senior Faculty Members at SSRL, Stanford University (1998 - 2001)
- Member, AGU Mineral and Rock Physics National Committee (1998 - 2001)
- Visiting Professor, Universite Paris VII (1998 - 1999)
- Chair, Environmental Science/Geosciences Working Group, DOE-BES Workshop on Building a Scientific Case for the Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA (1998 - 1998)
- Co-Convener, Symposium on Applications of Synchrotron Radiation in Mineralogy, 17th International Mineralogical Association Meeting, Toronto, Ontario, Canada (1998 - 1998)
- Invited Lecturer, Nanostructures, Energy, and Technology Seminar, U.C. Davis, Davis, CA; San Francisco Gem and Mineral Society; DOE-BES Workshop on Building a Scientific Case for the Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA; Environmental Science Colloquium, Dept. of Physics, U.C. Riverside, Riverside, CA; Interface Science Seminar, Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Hanford, WA; (1998 - 1998)
- Invited Lecturer, Keynote Address: Canadian Synchrotron Institute Workshop on Opportunities for Synchrotron Light in Mining, Natural Resources, and the Environment, Vancouver, B.C., Canada; (1998 - 1998)
- Invited Lecturer, Advanced Photon Source Users Meeting Workshop on Environmental and Geosciences, Argonne National Laboratory, Argonne, IL; National Academy of Sciences Colloquium on Geology, Mineralogy, and Human Welfare, Irvine, CA (1998 - 1998)
- Member, Search Committee, Director of SLAC, SLAC, Stanford University (1998 - 1998)
- Participant, Department of Energy, Nuclear Energy Research Initiative Workshop, Washington, DC (1998 - 1998)
- Participant and Invited Speaker, National Academy of Sciences Colloquium on Geology, Mineralogy, and Human Welfare, Irvine, CA (1998 - 1998)
- Plenary Lecture, Environmental Management Science Program Review, Chicago, IL (1998 - 1998)
- Member, Environmental Research Division Review Committee, Argonne National Laboratory (1997 - 2002)
- Member, Science Advisory Committee, Advanced Light Source, Lawrence Berkeley National Laboratory (1997 - 2001)
- Member, Users Advisory Committee, Environmental Molecular Science Laboratory, Pacific Northwest National Laboratory (1997 - 2000)
- Chair, Search Committee, Director of the Stanford Synchrotron Radiation Laboratory, SLAC, Stanford University (1997 - 1998)
- Member, Basic Energy Sciences Advisory Committee Panel on Synchrotron Radiation Sources and Science (1997 - 1998)
- Co-Convener, DOE Workshop on Chemical Interactions at Metal Oxide-Aqueous Solution Interfaces, Santa Fe, NM (1997 - 1997)
- Co-Convener, Symposium on Applications of Synchrotron Radiation in the Earth and Environmental Sciences,, American Geophysical Union Meeting, San Francisco, CA (1997 - 1997)
- Member, International Organizing Committee, 10th International Conference on X-ray Absorption Fine Structure (1997 - 1997)
- Member, Visiting Committee, Department of Geology, Arizona State University (1997 - 1997)
- Organizer, DOE-Chemical Sciences Workshop on Molecular Environmental Science and Synchrotron Radiation Facilities, Stanford Synchrotron Radiation Laboratory (1997 - 1997)
- Participant, DOE Earth Sciences Council Workshop on Scaling in Geological Processes (1997 - 1997)
- Member, U.S. Department of Energy, Council on Chemical Sciences (1996 - 2001)
- Member, Visiting Committee, Geophysical Laboratory, Carnegie Institution of Washington (1996 - 2000)
- Co-Chair, DOE Council on Chemical Sciences Workshop on Chemical Interactions at Metal Oxide-Aqueous Solution Interfaces (1996 - 1999)
- Co-Editor, Journal of Synchrotron Radiation (1995 - 2003)
- Chair, Search Committee for Soil/Environmental Geochemist, Stanford University (1994 - 1998)

- Co-Chair, Beam Line 11 Technical Planning Group, Stanford Synchrotron Radiation Laboratory (1994 - 1998)
- Chair, Chemical Sciences Division, Initiative in Molecular Environmental Science, U.S. Department of Energy, (1994 - 1997)
- Member, Visiting Committee, Department of Geological & Geophysical Sciences, Princeton University (1993 - 2000)
- Member and Co-organizer, Interdisciplinary Research Group on the Structure and Reactivity of Oxide Surfaces, Stanford Center for Materials Research (1993 - 1999)
- Head, Environmental Sciences Section, Stanford Synchrotron Radiation Laboratory Research Department (1992 - present)
- Member, Steering Committee, GeoSoilEnviro CARS, Advanced Photon Source, Argonne National Laboratory (1990 - present)
- Member, Board of Governors, Gemological Institute of America (1988 - 2008)
- Member (Chair, 1990-92, 1999-2002), External Review Committee, Chemical Science and Technology Division (now Chemistry Division), Los Alamos National Laboratory (1988 - 2003)
- Chair, Research Advisory Committee, Gemological Institute of America (1984 - 2008)
- Curator, Stanford Research Mineral Collection and Display, Stanford Univesity (1978 - present)
- Member, Executive Committee of the Center for Materials Research, Stanford University (1978 - 1999)

PROFESSIONAL EDUCATION

- Ph.D., Virginia Polytechnic Institute and State University , Mineralogy and Crystallography (1970)
- M.S., Virginia Polytechnic Institute and State University , Mineralogy and Crystallography (1968)
- B.S., Millsaps College , Chemistry and Geology (1965)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research

My research interests involve five main areas: (1) geochemistry of mineral surfaces and their reactivity with aqueous metal complexes, organic matter, and microbial organisms; (2) structure and properties of natural and manufactured nanoparticles; (3) environmental chemistry/geochemistry of heavy metal and actinide contaminants; (4) experimental studies of carbon sequestration through mineral carbonation reactions; and (5) structure-property relationships of silicate liquids and glasses. The first four areas have bearing on the sequestration, transport, and transformations of environmental contaminants (e.g., mercury, lead, arsenic, uranium, and CO2) in aquatic systems, soils, and the atmosphere; the last focuses on the high-temperature geochemistry of silicate magmas and their trace elements. My students and I utilize various types of macroscopic and microscopic measurements, including the very intense x-rays from synchrotron radiation sources, as well as field investigations.

Teaching

I teach courses at both the undergraduate and graduate levels, including Earth Materials (GES 102), the basic sophomore-level course required of GES majors on minerals and rocks and the processes that form and modify them; Environmental Geochemistry (GES 170/270), a senior-, graduate-level course on the chemistry of the environment; and Physics and Chemistry of Minerals and Mineral Surfaces (GES 261), a graduate-level course on my specialty. I also occasionally teach a sophomore seminar on environment and human health as well as graduate seminars on current topics in environmental geochemistry and mineral surface and aqueous geochemistry.

Professional Activities

Elected Fellow, Academia Europaea (2013); Ian Campbell Medal, American Geosciences Institute (2012); Patterson Medal, Geochemical Society for Environmental Geochemistry Research (2007); Roebling Medal, Mineralogical Society of America (2007); director, Stanford-NSF Environmental Molecular Science Institute (2004-2011); member, Science Advisory Committees of the DOE Office of Basic Energy Sciences (2011-present);

Environmental Molecular Science Laboratory-PNNL (2003-present); Sincrotrone Trieste-Italian National Synchrotron Laboratory (2005-2011); Center for Advanced Microdevices-LSU (2005-2010); Advanced Light Source-LBNL (1997-2000); Canadian Light Source (1999-2002); Chemistry Division-Los Alamos National Laboratory (1988-2003); fellow, American Association for the Advancement of Science (2000); fellow, Geochemical Society and European Association of Geochemistry (1999); fellow, Geological Society of America (1997); fellow, Mineralogical Society of America (1975); Docteur Honoris Causa degree, Universite Paris 7 (1997); president, Mineralogical Society of America (1996); professor (1988-present) and chair (1998-2007), Stanford Synchrotron Radiation Laboratory Faculty (now Department of Photon Science), SLAC; member, Board of Governors, Gemological Institute of America (1988-2008); chair, Department of Geology, Stanford (1986-1992); co-director, Stanford-NSF Center for Materials Research (1987-1989); chair, Department of Geological & Environmental Sciences (2012-present).

Publications

PUBLICATIONS

- **(in press) Reservoir oxidation by geologically sequestered CO2.** *Geochim. Cosmochim. Acta*
  Nielsen, L. C., Maher, K., Brown, Jr., G. E., Bird, D. K., Thomas, B., Johnson, N. C., Rosenbauer, R. J.
  2105

- **Oxide- and Silicate-Water Interfaces and Their Roles in Technology and the Environment.** *Chemical reviews*
  Bañuelos, J. L., Borguet, E., Brown, G. E., Cygan, R. T., DeYoreo, J. J., Dove, P. M., Gaigeot, M. P., Geiger, F. M., Gibbs, J. M., Grassian, V. H., Ilgen, A. G., Jun, Y. S., Kabengi, et al
  2023

- **Pauling's rules for oxide-based minerals: A re-examination based on quantum mechanical constraints and modern applications of bond-valence theory to Earth materials** *AMERICAN MINERALOGIST*
  Gibbs, G., Hawthorne, F. C., Brown, G. E.
  2022; 107 (7): 1219-1248

- **Mechanism of Arsenic Partitioning During Sulfidation of As-Sorbed Ferrihydrite Nanoparticles.** *ACS earth & space chemistry*
  Kumar, N., Noël, V., Besold, J., Planer-Friedrich, B., Boye, K., Fendorf, S., Brown, G. E.
  2022; 6 (7): 1666-1673

- **Mechanism of Arsenic Partitioning During Sulfidation of As-Sorbed Ferrihydrite Nanoparticles** *ACS EARTH AND SPACE CHEMISTRY*
  Kumar, N., Noel, V., Besold, J., Planer-Friedrich, B., Boye, K., Fendorf, S., Brown Jr, G. E.
  2022

- **Chemical and Reactive Transport Processes Associated with Hydraulic Fracturing of Unconventional Oil/Gas Shales.** *Chemical reviews*
  Jew, A. D., Druhan, J. L., Ihme, M., Kovscek, A. R., Battiato, I., Kaszuba, J. P., Bargar, J. R., Brown, G. E.
  2022

- **Reply to the Comment on "FeS colloids - formation and mobilization pathways in natural waters" by S. Peiffer, D0EN00967A** *ENVIRONMENTAL SCIENCE-NANO*
  Noel, V., Kumar, N., Boye, K., Lezama-Pacheco, J. S., Brown, G. E., Bargara, J. R.
  2021; 8 (6): 1817-1821

- **Global Sensitivity Analysis of a Reactive Transport Model for Mineral Scale Formation During Hydraulic Fracturing** *Environmental Engineering Science*
  Li, Q., Wang, L., Perzan, Z., Caers, J., Brown Jr., G. E., Bargar, J. R., Maher, K.
  2021

- **FeS colloids - formation and mobilization pathways in natural waters** *ENVIRONMENTAL SCIENCE-NANO*
  Noel, V., Kumar, N., Boye, K., Barragan, L., Lezama-Pacheco, J. S., Chu, R., Tolic, N., Brown, G. E., Bargar, J. R.
  2020; 7 (7): 2102–16

- **Reactive Transport Modeling of Shale-Fluid Interactions after Imbibition of Fracturing Fluids** *ENERGY & FUELS*
  Li, Q., Jew, A. D., Brown, G. E., Bargar, J. R., Maher, K.
  2020; 34 (5): 5511–23

- **Chemical Speciation and Stability of Uranium in Unconventional Shales: Impact of Hydraulic Fracture Fluid.** *Environmental science & technology*
  Jew, A. D., Besançon, C. J., Roycroft, S. J., Noel, V. S., Bargar, J. R., Brown, G. E.
  2020
- **Redox Heterogeneities Promote Thioarsenate Formation and Release into Groundwater from Low Arsenic Sediments.** *Environmental science & technology*
  Kumar, N. n., Noël, V. n., Planer-Friedrich, B. n., Besold, J. n., Lezama-Pacheco, J. n., Bargar, J. R., Brown, G. E., Fendorf, S. n., Boye, K. n.
  2020
- **Thicknesses of Chemically Altered Zones in Shale Matrices Resulting from Interactions with Hydraulic Fracturing Fluid** *ENERGY & FUELS*
  Li, Q., Jew, A. D., Kohli, A., Maher, K., Brown, G. E., Bargar, J. R.
  2019; 33 (8): 6878–89
- **Alteration depths from the shale surface into the matrix**
  Li, Q., Jew, A., Kohli, A., Brown, G., Maher, K., Bargar, J.
  AMER CHEMICAL SOC.2019
- **Shale Kerogen: Hydraulic Fracturing Fluid Interactions and Contaminant Release** *ENERGY & FUELS*
  Dustin, M. K., Bargar, J. R., Jew, A. D., Harrison, A. L., Joe-Wong, C., Thomas, D. L., Brown, G. E., Maher, K.
  2018; 32 (9): 8966–77
- **Sulfidation mechanisms of Fe(III)-(oxyhydr)oxide nanoparticles: a spectroscopic study** *ENVIRONMENTAL SCIENCE-NANO*
  Kumar, N., Pacheco, J., Noel, V., Dublet, G., Brown, G. E.
  2018; 5 (4): 1012–26
- **Theoretical and experimental investigations of mercury adsorption on hematite surfaces** *JOURNAL OF THE AIR & WASTE MANAGEMENT ASSOCIATION*
  Jung, J., Liguori, S., Jew, A. D., Brown, G. E., Wilcox, J.
  2018; 68 (1): 39–53
- **E#ects of nano-confinement on Zn(II) adsorption to nanoporous silica** *Geochimica et Cosmochimica Acta*
  Nelson, J., Bargar, J. R., Wasylenki, L., Brown Jr., G. E., Maher, K.
  2018; 240: 80-97
- **Partitioning of uranyl between ferrihydrite and humic substances at acidic and circum-neutral pH** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Dublet, G., Pacheco, J., Bargar, J. R., Fendorf, S., Kumar, N., Lowry, G. V., Brown, G. E.
  2017; 215: 122–40
- **Kinetics and Products of Chromium(VI) Reduction by Iron(II/III)-Bearing Clay Minerals** *ENVIRONMENTAL SCIENCE & TECHNOLOGY*
  Joe-Wong, C., Brown, G. E., Maher, K.
  2017; 51 (17): 9817–25
- **Impact of Organics and Carbonates on the Oxidation and Precipitation of Iron during Hydraulic Fracturing of Shale** *ENERGY & FUELS*
  Jew, A. D., Dustin, M. K., Harrison, A. L., Joe-Wong, C. M., Thomas, D. L., Maher, K., Brown, G. E., Bargar, J. R.
  2017; 31 (4): 3643-3658
- **Effects of surface structural disorder and surface coverage on isotopic fractionation during Zn(II) adsorption onto quartz and amorphous silica surfaces** *Geochimica et Cosmochimica Acta*
  Nelson, J., Wasylenki, L., Bargar, J. R., Brown Jr., G. E., Maher, K.
  2017; 215: 354-376
- **Clumped-isotope thermometry of magnesium carbonates in ultramafic rocks** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  del Real, P. G., Maher, K., Kluge, T., Bird, D. K., Brown, G. E., John, C. M.
  2016; 193: 222-250
- **Effect of biofilm coatings at metal-oxide/water interfaces II: Competitive sorption between Pb(II) and Zn(II) at Shewanella oneidensis/metal-oxide/water interfaces** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Wang, Y., Gelabert, A., Michel, F. M., Choi, Y., Eng, P. J., Spormann, A. M., Brown, G. E.
  2016; 188: 393-406

- **Pb, Cu, and Zn distributions at humic acid-coated metal-oxide surfaces** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Wang, Y., Michel, F. M., Choi, Y., Eng, P. J., Levard, C., Siebner, H., Gu, B., Bargar, J. R., Brown, G. E.
  2016; 188: 407-423
- **Comparison of isoelectric points of single-crystal and polycrystalline alpha-Al2O3 and alpha-Fe2O3 surfaces** *AMERICAN MINERALOGIST*
  Wang, Y., Persson, P., Michel, F. M., Brown, G. E.
  2016; 101 (9-10): 2248-2259
- **Effect of biofilm coatings at metal-oxide/water interfaces I: Pb(II) and Zn(II) partitioning and speciation at Shewanella oneidensis/metal-oxide/water interfaces** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Wang, Y., Gelabert, A., Michel, F. M., Choi, Y., Gescher, J., Ona-Nguema, G., Eng, P. J., Bargar, J. R., Farges, F., Spormann, A. M., Brown, G. E.
  2016; 188: 368-392
- **Uranium Immobilization and Nanofilm Formation on Magnesium Rich Minerals** *ENVIRONMENTAL SCIENCE & TECHNOLOGY*
  van Veelen, A., Bargar, J. R., Law, G. T., Brown, G. E., Wogelius, R. A.
  2016; 50 (7): 3435-3443
- **A spatially resolved surface kinetic model for forsterite dissolution** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Maher, K., Johnson, N. C., Jackson, A., Lammers, L. N., Torchinsky, A. B., Weaver, K. L., Bird, D. K., Brown, G. E.
  2016; 174: 313-334
- **Silver Sulfidation in Thermophilic Anaerobic Digesters and Effects on Antibiotic Resistance Genes** *ENVIRONMENTAL ENGINEERING SCIENCE*
  Kim, B., Miller, J. H., Monsegue, N., Levard, C., Hong, Y., Hull, M. S., Murayama, M., Brown, G. E., Vikesland, P. J., Knocke, W. R., Pruden, A., Hochella, M. F.
  2016; 33 (1): 1-10
- **First-Principles Investigation of Mercury Adsorption on the alpha-Fe2O3(1(1)over-bar02) Surface** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Jung, J., Geatches, D., Lee, K., Aboud, S., Brown, G. E., Wilcox, J.
  2015; 119 (47): 26512-26518
- **Ni cycling in mangrove sediments from New Caledonia** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Noel, V., Morin, G., Juillot, F., Marchand, C., Brest, J., Bargar, J. R., Munoz, M., Marakovic, G., Ardo, S., Brown, G. E.
  2015; 169: 82-98
- **Mercury Interaction with the Fine Fraction of Coal-Combustion Fly Ash in a Simulated Coal Power Plant Flue Gas Stream** *ENERGY & FUELS*
  Jew, A. D., Rupp, E. C., Geatches, D. L., Jung, J., Farfan, G., Bahet, L., Hower, J. C., Brown, G. E., Wilcox, J.
  2015; 29 (9): 6025-6038
- **Goethite aging explains Ni depletion in upper units of ultramafic lateritic ores from New Caledonia** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Dublet, G., Juillot, F., Morin, G., Fritsch, E., Fandeur, D., Brown, G. E.
  2015; 160: 1-15
- **Sedimentary reservoir oxidation during geologic CO2 sequestration** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Lammers, L. N., Brown, G. E., Bird, D. K., Thomas, R. B., Johnson, N. C., Rosenbauer, R. J., Maher, K.
  2015; 155: 30-46
- **Stable Hg Isotope Signatures in Creek Sediments Impacted by a Former Hg Mine** *ENVIRONMENTAL SCIENCE & TECHNOLOGY*
  Smith, R. S., Wiederhold, J. G., Jew, A. D., Brown, G. E., Bourdon, B., Kretzschmar, R.
  2015; 49 (2): 767-776
- **As(III) and As(V) speciation during transformation of lepidocrocite to magnetite.** *Environmental Science & Technology*
  Wang, Y., Morin, G., Ona-Nguema, G., Brown, Jr., G. E.
  2015; 48 (24): 14282-14290
- **(in press) The role of the Si-rich surface layer in forsterite dissolution. 2: An “ion-by-ion” model for dissolution and Mg isotope fractionation.** *Geochimica et Cosmochimica Acta*
  Maher, K., Nielsen-Lammers, L. C., Johnson, N. C., Torchinsky, A. B., Weaver, K. I., Bird, D. K., Brown, Jr., G. E.

2015

- **(in press) Ni cycling in mangrove sediments from New Caledonia.** *Environmental Science & Technology*
  Noel, V., Morin, G., Juillot, F., Marchand, C., Brest, J., Bargar, J. R., Munoz, M., Marakovic, G., Ardo, S., Brown, Jr., G. E.
  2015
- **(submitted) Goethite aging explains Ni depletion in upper units of ultramafic lateritic ores from New Caledonia.** *Geochimica et Cosmochimica Acta*
  Dublet, G., Juillot, F., Morin, G., Fritsch, E., Fandeur, D., Brown, Jr., G. E.
  2015
- **Stable Hg isotope signatures in creek sediments impacted by a former Hg mine.** *Environmental Science & Technology*
  Smith, R. S., Wiederhold, J. G., Jew, A. D., Brown, Jr., G. E., Bourdon, B., Kretszchmer, R.
  2015; 49 (2): 767-776
- **(submitted) The role of the Si-rich layer in forsterite dissolution. 3: Spatially and temporally resolved incorporation of an isotopic tracer.** *Geochimica et Cosmochimica Acta*
  Johnson, N. C., Rosenbauer, R. J., Bird, D. K., Brown, Jr., G. E., Chidsey, C. E., Maher, K.
  2015
- **Arsenic(III) and Arsenic(V) Speciation during Transformation of Lepidocrocite to Magnetite** *ENVIRONMENTAL SCIENCE & TECHNOLOGY*
  Wang, Y., Morin, G., Ona-Nguema, G., Brown, G. E.
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- **Preparation, Structure, and Orientation of Pyrite FeS2{100} Surfaces: Anisotropy, Sulfur Monomers, Dimer Vacancies, and a Possible FeS Surface Phase** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Andersson, K. J., Ogasawara, H., Nordlund, D., Brown, G. E., Nilsson, A.
  2014; 118 (38): 21896-21903
- **Sulfidation of copper oxide nanoparticles and properties of resulting copper sulfide** *ENVIRONMENTAL SCIENCE-NANO*
  Ma, R., Stegemeier, J., Levard, C., Dale, J. G., Noack, C. W., Yang, T., Brown, G. E., Lowry, G. V.
  2014; 1 (4): 347-357
- **Small-scale studies of roasted ore waste reveal extreme ranges of stable mercury isotope signatures** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Smith, R. S., Wiederhold, J. G., Jew, A. D., Brown, G. E., Bourdon, B., Kretzschmar, R.
  2014; 137: 1-17
- **Properties of impurity-bearing ferrihydrite III. Effects of Si on the structure of 2-line ferrihydrite** *GEOCHIMICA ET COSMOCHIMICA ACTA*
  Cismasu, A. C., Michel, F. M., Tcaciuc, A. P., Brown, G. E.
  2014; 133: 168-185
- **Olivine dissolution and carbonation under conditions relevant for in situ carbon storage** *CHEMICAL GEOLOGY*
  Johnson, N. C., Thomas, B., Maher, K., Rosenbauer, R. J., Bird, D., Brown, G. E.
  2014; 373: 93-105
- **Integrated Approaches of X-Ray Absorption Spectroscopic and Electron Microscopic Techniques on Zinc Speciation and Characterization in a Final Sewage Sludge Product** *JOURNAL OF ENVIRONMENTAL QUALITY*
  Kim, B., Levard, C., Murayama, M., Brown, G. E., Hochella, M. F.
  2014; 43 (3): 908-916
- **Small-scale studies on roasted ore waste reveal extreme ranges of mercury isotope signatures** *Geochimica et Cosmochimica Acta*
  Smith, R. S., Wiederhold, J. G., Jew, A. D., Brown, Jr., G. E., Bourdon, B., Kretzschmar, R.
  2014; 137: 1-17
- **XAS evidence for Ni sequestration by siderite in a lateritic Ni-deposit from New Caledonia** *AMERICAN MINERALOGIST*
  Dublet, G., Juillot, F., Morin, G., Fritsch, E., Noel, V., Brest, J., Brown, G. E.
  2014; 99 (1): 225-234
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