

## Katherine Haines Freeman

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### Education

Ph.D. 1991 Department of Geology, Indiana University, Bloomington, IN USA  
M.S. 1989 Department of Geology, Indiana University, Bloomington, IN USA  
B.A. 1984 *Cum laude*, Geology and Classical Civilization, Wellesley College, Wellesley, MA USA

### Research Interests

I develop methods to analyze stable isotope ratios of fossil biomolecules and other organic compounds and I use molecular and intramolecular isotopes to study past climate, biogeochemistry, and astrobiology.

### Professional Appointments

2018-present Director, NASA Astrobiology Center for Isotopologue Research (ACIR)  
2016-present Evan Pugh University Professor, Pennsylvania State University  
2015-2016 Distinguished Professor of Geosciences, Pennsylvania State University  
2013-present Co-Editor, *Annual Review of Earth and Planetary Sciences*  
2014-2016 Chair, Organic Geochemistry Division, Geochemical Society  
2011 Crosby Lecturer, Dept. of Earth, Atmospheric and Planetary Sciences, MIT  
2011 Visiting Faculty, Dept. of Biology and Geology & Geophysics, University of Utah  
2010 Visiting Scientist, National Museum of Natural History, Smithsonian Institution  
2004-2009 Associate Head for Graduate Programs and Research, Department of Geosciences, Pennsylvania State University  
2003-2007 Director, Penn State Biogeochemistry Research Initiative in Education, NSF-IGERT graduate student training program  
2002 Guest Investigator, Woods Hole Oceanographic Institution (sabbatical visitor)  
1999-2002 Associate Director, Penn State Biogeochemistry Research Initiative in Education, NSF-IGERT graduate student training program  
1991-2015 Assistant, Associate and Professor of Geosciences, Pennsylvania State University  
1991 Postdoctoral Associate, Skidaway Institute of Oceanography, Savannah, GA; Advisor: S.G. Wakeham  
1984-1990 Graduate Research Assistant, Dept of Geology, Indiana University; Advisor: J. M. Hayes  
1984 Associate Instructor, Geologic Field Station, Indiana University  
1981-1984 Visiting Investigator, Carnegie Institution of Washington, Geophysical Laboratory; Advisor: Thomas C. Hoering

### Honors and Awards

2019-2020 Moore Distinguished Scholar, Caltech (for 2019-2020 sabbatical)  
2019 Richard Owen Alumni Award, Department of Earth and Atmospheric Sciences, Indiana University, Bloomington, IN  
2017 William S. and Carelyn Y. Reeburgh Lecture, American Geophysical Union  
2017 The Alfred Treibs Award, The Geochemical Society  
2013 Fellow, American Geophysical Union

2013 Elected to membership, the U.S. National Academy of Sciences  
2012 Cozzarelli Prize, the U.S. National Academy of Sciences  
2012 Heinz Lowenstam Science Innovation Award, European Association of Geochemistry  
2011 Fellow, Geochemical Society and European Association of Geochemistry  
2011 Fellow, American Academy of Microbiology  
2010-2011 Fellow, John Simon Guggenheim Memorial Foundation  
2007 Fellow, Geological Society of America  
2001-2014 Fellow, Canadian Institute for Advanced Research, Earth System Evolution Program  
1999 James Lee Wilson Medal in Sedimentology, SEPM, the Society for Sedimentary Geology  
1997 The Peter Schenck Award, European Association of Organic Geochemists  
1987 NASA Graduate Student Researchers Program Fellowship  
1984 The Patricia Roberts Harris Fellowship  
1983 The Sarah F. Langer Award, Wellesley College

*At The Pennsylvania State University:*

2013 The Wilson Award for Excellence in Research, College of Earth and Mineral Sciences  
2008 Faculty Mentoring Award, College of Earth and Mineral Sciences  
2004 The Wilson Award for Excellence in Teaching, College of Earth and Mineral Sciences  
2002 Graduate Faculty Teaching Award, the Graduate School

## EDUCATION, TEACHING AND RESEARCH TRAINING

### Supervision of Graduate Student Research

#### *Former Students*

##### *As major advisor:*

Richard Pancost	Ph.D. (Geosciences)	1998	Professor, University of Bristol
Lee Colarusso	M.S. (Geosciences)	1998	MFG Sheppard Miller
Francis Cooper	M.S. (Geosciences)	1995	Software engineer, Geosoft
Robert Dias	Ph.D. (Geosciences)	2000	U.S.G.S., Denver (retired)
Melinda Foland	M.S. (Geosciences)	2001	Engineer, ThermoFisher
Kenneth McRowe	M.S. (Geosciences)	2003	Consulting hydrologist
Nicolai Pendentchouk	Ph.D. (Geosciences)	2004	RCUK Fellow, Univ. of East Anglia
Jennifer Eigenbrode	Ph.D. (Geosciences)	2004	Scientist, NASA Goddard
Courtney Turich	Ph.D. (Geosciences)	2006	Schlumberger, Paris France
Kristine Nielson	M.S. (Geosciences)	2006	Staff, University of Adelaide
James Moran	Ph.D. (Geosciences)	2007	Scientist, Pacific Northwest Natl. Lab
Katja Meyer	Ph.D. (Geosciences)	2008	Asst. Professor, Willamette College
Aaron Diefendorf	Ph.D. (Geosciences)	2010	Associate Professor, U. Cincinnati
Heidi Albrecht	Ph.D. (Geosciences)	2011	Shell Oil
Katherine Dawson	Ph.D. (Geosciences)	2011	Asst. Professor, Rutgers
Clayton Magill	Ph.D. (Geosciences)	2013	Lecturer, Hariott-Watt
Heather Graham	Ph.D. (Geosciences)	2014	Research Scientist, NASA
Angela Chung	M.S. (Geosciences)	2015	PhD student, Univ. Pittsburgh
Christine Doman	M.S. (Geosciences)	2015	Analytical Chemist, Sports Medicine Research
Elizabeth Denis	Ph.D. (Geosciences)	2016	Staff Scientist, PNNL
Laurence Bird	Ph.D. (Geosciences)	2016	USGS, Reston
Allison Karp	Ph.D. (Geosciences)	2020	Postdoc, Yale
Shelby Lyons	Ph.D. (Geosciences)	2020	ExxonMobil
Allison Fox	Ph.D. (Geosciences)	2020	Postdoc, NASA Goddard

##### *As co-advisor or research supervisor:*

Timothy Filley	Ph.D. (Geosciences)	1997	Professor, Purdue University
Daniel McKinney	Ph.D. (Fuel Sciences)	1998	Shell Oil
Mark Pagani	Ph.D. (Geosciences)	1998	deceased; former: Professor, Yale University
Mark Strynar	Ph.D. (Soil Science)	2002	Researcher, U.S. EPA
Jamie Fulton	Ph.D. (Geosciences)	2010	Asst. Professor, Baylor University
Christopher Junium	Ph.D. (Geosciences)	2010	Assoc. Professor, Syracuse University
Kevin Mueller	Ph.D. (Ecology)	2011	Asst. Professor, Cleveland State University
Adriana Russo	M.S. (Geosciences)	2019	Ph.D. student at UC Riverside

#### *Current students*

Troy Ferland	Ph.D. (Geosciences)	(2017-present)	passed comprehensive Exam, 2019
Esther Munoz	Ph.D. (Geosciences)	2019-present;	co-advised with C. House
Emma Hartke	M.S. (Geosciences)	2020-present	
Youki Sato	Ph.D. (Geosciences)	2020-present	

### Supervision of Postdoctoral Scholars

Hiroshi Naraoka,	2/96-12/96 (supported by Japanese Government);	Tokyo University
Yongsong Huang	1/97-12/99(supported by grants to Freeman and Arthur);	Brown University

Andy Zimmerman 7/00-02 (supported by IGERT-BRIE; Brantley Freeman); Univ. Florida  
 Gary Icopini 7/00-01 (supported by IGERT-BRIE; Brantley, Freeman)  
 Francesca (Smith) McInerney 8/02-2006 (supported by NSF, Smithsonian Institution and Freeman),  
 University of Adelaide  
 Pratigya Polissar 1/05-2008 (supported by Freeman via CIFAR awards to Freeman, D. Rowley, U.  
 Chicago, S. Willett, ETH), LDEO, Columbia University; UC Santa Cruz  
 Anna Henderson 2010-2012 (supported by CIFAR; Freeman and S. Cowling); Planning  
 Director Climate and Energy, State of Minnesota  
 Sara Lincoln 2013-2018 (supported by C-IMAGE award to Freeman)  
 Allie Baczynski 2014-present (supported by NASA award to Freeman)  
 Gabriella Weiss 2019-present (supported by NASA award to Freeman)

### Visiting Scholars

Michael Joachimski 5/97-7/97 (supported by German Government)  
 Larissa Dsikowitzky 5/00-6/00 (supported by German Government)  
 Ros Rickaby 12/00 (supported by Harvard University)  
 Thomas Kuhn 1-2/01; 9-11/01; 2/02; 11/02 (supported by German Government)  
 Lidia Katarzyna Trocha 2011-2013 (supported by Freeman and D. Eissenstat)  
 Rosemary Bush 2011 visiting student from Northwestern University  
 Allie Baczynski 2011 visiting student from Northwestern University  
 Kendra Chritz 2011-2012 visiting student from University of Utah  
 Abigail Rooney 2012 visiting student from Trinity College, Dublin, Ireland  
 Sarah Enders 2012 visiting student from University of California at Davis  
 Ross Williams 2013 visiting student from MIT  
 Thomas Elliott Arnold 2014 visiting student from University of Florida

### Supervision of Undergraduate Research

#### *One-semester projects*

Ryabtseva, M.A., 1992, A study of Oil Spills  
 Sunderland, T., 1993, Biological Effects of Oil Spills in the Marine Environment  
 Hosterman, J., 1993, Transport and Microbial Degredation of Halogenated Organic Compounds in the  
 Subsurface  
 Bogle, C, 1994, Humic Substances: Structure, Transformations and Interactions with Contaminants  
 Cuno, C., 1994, Detoxification and Removal of BTEX Compounds from Unsaturated Zones and  
 Groundwater Sources  
 Voght, E., 1995, Legislation, Assessment and Remediation of Sites Contaminated with Petroleum  
 Hydrocarbons  
 Darcy, J., 1996, The Origins of life at Hydrothermal Vents (J. Kastings, advisor)  
 Harvey, M., 1996, Acid Rain and Its Effects on Aquatic Ecosystems

#### *Senior and Honors Theses (Two-semester projects)*

Follweiler, D., 1994, Compound-Specific Isotope Analyses of Plants and Sediments from Mud Lake,  
 Florida. Honors Thesis in Chemistry  
 Laukonen, K., 1997, Century-Long Sediment Record of Golf Course Herbicide Applications, Green Lake,  
 Fayetteville, N.Y. Honors Thesis in Geosciences  
 Sandomenico, T., 1997, Caffeine and Other Organic Tracers of Sewage in Soils and Groundwaters  
 Associated with the Living Filter Project, State College, PA. Senior Thesis in Geo-  
 Environmental Engineering

Moreland, M., 1999, Isotopic Records of Ecosystem Shifts in Tropical Lakes. Senior Thesis in Geosciences  
 Potisk, S. (2004). Isotopic analyses of microbial RNA monomers. Senior Thesis in Geosciences  
 Beausang, D.H. (2005) Spatial associations between climate and leaf wax n-alkanes from C3 and C4 grasses. Honors thesis in Geography.  
 Thornburg, J. (2006) The Younger Dryas transition observed in lacustrine sediments from Castor Lake, Washington. Senior Thesis in Geosciences  
 Galligan, K. (2009) Carbon and hydrogen isotopic compositions of plants past and present.  
 Sayles, Masoud (2010) Carbon sequestration in forest soils and the effects of tree species on soil organic matter.  
 Tavalavage, Annie (2012) Lipid biomarkers in sedge specimens.  
 Pederson, Eric (2013) Organic carbon in Eocene soils.  
 Gagnon, Cathy (2019-2020) Paleoclimate and ecology during Neolithic Settlements, Croatia  
 Rosland, Iman (2019-2020) Sediment and paleoclimate records of Olduva Gorge, Tanzania

*Other undergraduate student supervision, including summer students*

D. Beausang (2003, 2004), S. Harman (2003), S. Potisk (2003), A. Kleinhesselink (2004), D. Zemirah (2004); J. Thornburg (2004-2005); K. Galligan (2004-2005; 2007-2008); N. Patel (2009); N. Rivera (2009); P. Crooks (2009); J. Harris (2010); E. Pederson (2013); A. Tamalavage (2013); Robert Smith (2014); Jamie Vornlocher (2016); Safiya Alphius (2016); Rebecca Miller (2017); Ellen Polites (2016); Tori LaBirt (2017-2018); Cathy Gagnon (2019).

**Technical Staff Supervised & Supported**

Denny Walizer, Senior Research Assistant	1991-present
Margaret Ricci, Senior Research Assistant	1996-2002
Robert Burfield Research Assistant	1997-1998
Gabriel Montemurro, Research Assistant	1997-1999
Tracy Michelle Henniger, Research Assistant	2001-2004
Pratigya Polissar, part-time technician	2002-2005
Chris Lernihan, Research Assistant	2002-2006
Nevin Whitman, Laboratory Assistant	Summer 2007
Laurie Eccles, Laboratory Assistant	2010-2013
Heike Betz, Laboratory Manager	2018-present
Kate Meyers, Laboratory Assistant	2020-present

**Courses Taught (all at Penn State University)**

Semester	Course #	Title	Enrollment
Spring 1992	Geosc 454	Geology of Oil and Gas (80%)	24
	Geosc 497	Marine Biogeochemistry (33%)	6
Fall 1992	Geosc 419	Organic Geochemistry (50%)	10
Spring 1993	Geosc 454	Geology of Oil and Gas	15
	Earth 002	Gaia--The Earth System	60
	Geosc 597a	Hydrosciences Colloquium	2
Fall 1993	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	15

Spring 1994	Geosc 454	Geology of Oil and Gas (10%)	13
	Geosc 497c	Marine Biogeochemistry (33%)	9
	Earth 002	Gaia-The Earth System	97
Fall 1994	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	28
	Geosc 597i	Organic Matter and Earth History	8
Spring 1995	Geosc 494	Geology of Oil and Gas (5%)	14
	Geosc 597	Field Biogeochemistry	10
	Earth 002	Gaia-The Earth System	117
Fall 1995	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	21
Spring 1996	Earth 002	Gaia-The Earth System	95
	Geosc 597d	Origin and Early Evolution of Life (33%)	15
Fall 1996	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	21
	Geosc 597d	Hydrosciences Colloquium	
Spring 1997	Earth 002	Gaia- The Earth System	108
	Geosc 497i	Field Techniques in Environmental Geochemistry (20%)	9
Fall 1997	Geosc 497i	Field Techniques in Environmental Geochemistry (20%)	12
Spring 1998	Geosc 597d	Molecular Indicators of Geologic Processes	5
Fall 1998	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	25
	Geosc 497i	Field Techniques in Environmental Geochemistry (20%)	13
Spring 1999	Earth 100	Environment Earth	175
	Geosc 502	Evolution of the Biosphere (5%)	20
	Geosc 504	Advanced Geochemistry (10%)	5
Fall 1999	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	23
	Geosc 413	Field Techniques in Environmental Geochemistry (20%)	12
	Geosc 4/597a	Astrobiology (10%)	8
Spring 2000	Geosc 597c	Microbial Biogeochemistry	6
	Geosc 597a	Biogeochemical Analysis (7 %)	5
Fall 2000	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	23
	Geosc 413	Field Techniques in Environmental Geochemistry (20 %)	15
	Geosc 597a	Biogeochemical Analyses (1 lecture & lab)	11
	Geosc 597f	Issues in Geosciences (5 %)	18
	Geosc 597c	Astrobiology Seminar (1 lecture)	4
Spring 2001	Geosc 597a	Microbial Biogeochemistry (50%)	9
	Earth 002	Gaia – The Earth System	190
Fall 2002	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	8
	Geosc 597c	Methane Biogeochemistry (25%)	13

Spring 2003	Earth 002 Geosc 597a	Gaia—The Earth System Microbial Biogeochemistry (50%)	140 5
Fall 2003	Geosc 419 Geosc 597	Organic Geochemistry of Natural Waters & Sediments Biogeochemical Analyses (2.5 weeks)	12 5
Spring 2004	Earth 002 Geosc 597x	Gaia—The Earth System Stable isotopes in Terrestrial Ecosystems	100 8
Fall 2004	Geosc 519 Geosc 597	Stable Isotope Geochemistry Biogeochemical Analyses (20%)	8 5
Spring 2005	Geosc 597	Microbial Biogeochemistry (25%)	6
Fall 2005	Geosc 419 Geosc 500	Organic Geochemistry of Natural Waters and Sediments Issues in Geosciences (20%)	8 22
Spring 2006	Geosc 597A	Molecular Isotope Systems	6
Fall 2006	Geosc 518 Geosc 500	Stable Isotope Geochemistry Issues in Geosciences (10%)	10 19
Spring 2007	Earth 002	Gaia—The Earth System	90
Fall 2007	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	11
Fall 2008	Geosc 518 Geosc 500	Stable Isotope Geochemistry Issues in Geosciences (50%)	18 25
Fall 2009	Geosc 419 Geosc 500	Organic Geochemistry of Natural Waters & Sediments Issues in Geosciences (50%)	15 20
Spring 2010	Geosc 518 Geosc 597	Stable Isotope Geochemistry Isoscapes Seminar	8 7
Fall 2011	Geosc 419 Abio 590	Organic Geochemistry of Natural Waters & Sediments Astrobiology seminar (10%)	20 8
Spring 2012	Geosc 518 Earth 002	Stable Isotope Geochemistry Gaia—The Earth System	12 125
Fall 2012	Geosc 419 Geosc 587 Geosc 597E Geosc 597C	Organic Geochemistry of Natural Waters & Sediments Preparing for an Academic Career in the Geosciences (50%) Topics in Biogeochemistry (50%) Petroleum Geosystems (10 %)	24 8 16 16
Spring 2013	Geosc 518 Geosc 597 B	Stable Isotope Geochemistry Words to Live by: Writing Science	17 12
Fall 2013	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	19

	Geosc 597 E	Topics in Biogeochemistry (50%)	5
Spring 2014	Geosc 518	Stable Isotope Geochemistry	5
	Geosc 597E	Words to Live by: Writing Science	10
Fall 2014	Geosc 587	Preparing for an Academic Career in the Geosciences (50%)	12
	Geosc 597J	Advanced Biomarkers and Biosignatures	10
Spring 2015	Geosc 518	Stable Isotope Geochemistry	17
	Geosc 597E	Words to Live by: Writing Science	14
Fall 2015	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	18
	Geosc 597	Ocean Acidification: Past, Present, and Future	12
Spring 2016	Geosc 597	Words to Live By: Writing Science	17
	Geosc 518	Stable Isotope Geochemistry	18
Fall 2016	Geosc 419	Organic Geochemistry of Natural Waters & Sediments	20
	Geosc 587	Preparing for an Academic Career in the Geosciences (50%)	8
	Geosc 597	Future of Paleooceanography (25%, seminar)	12
	Geosc 597	Petroleum Geosystems (10%)	5
Spring 2017	Geosc 518	Stable Isotope Geochemistry	15
Fall 2017	Geosc 419	Organic Geochemistry of Natural Waters and Sediments	18
Spring 2018	Geosc 518	Stable Isotope Geochemistry	10
	Geosc 597	Words to Live By: Writing Science	9
Fall 2018	Geosc 419	Organic Geochemistry of Natural Waters and Sediments	14
	Geosc 587	Preparing for an Academic Career in the Geosciences (33%)	12
Spring 2019	Geosc 597	Words to Live By: Writing Science	12
Fall 2020	Geosc 419	Organic Geochemistry of Natural Waters and Sediments (Zoom)	15

### **Other Teaching & Curricular Activities**

Associate Head for Graduate Programs and Research, Department of Geosciences, 2004-2010.

Stable Isotope Ecology (Biology 581), University of Utah, Salt Lake City UT, (instructor); 1999-2000, 2002- 2014, 2016- 2018

Professor-in-charge, Geobiology B.S. degree program, Department of Geosciences, 2004-2005

Director, IGERT Biogeochemistry Research Initiative in Education (BRIE), 2003-2007 (Associate director, 1999-2003)

Dual-Title Ph.D. program in Biogeochemistry (lead author on proposal; with Chris House); program approved Spring 2008.

Faculty Mentor, Climate Science REU (NSF) program (2015-present)

Faculty Member, Climate Science Ph.D. (Dual-Title) program (2018-present)



## Participation in Seminars and Workshops

- Gordon Research Conference on Organic Geochemistry, Plymouth, N.H., 13-17, August 1990 (invited speaker)
- Workshop on Interfacing a Gas Chromatograph to an Isotope-Ratio Mass Spectrometer, Department of Chemistry, University of Bristol, England, 23-24 September, 1991 (co-organized workshop; wrote report summarizing workshop for Finnigan MAT)
- Symposium on Compound Specific Isotope Analyses in Organic and Petroleum Geochemistry, American Chemical Society National Meeting, San Francisco, 5-10 April 1992 (session chair)
- Gordon Research Conference on Organic Geochemistry, Plymouth, N.H. 10-14 August, 1992 (invited speaker)
- International Association of Geochemistry and Cosmochemistry, 3rd International Symposium on Geochemistry of the Earth Surface 1-4 August 1993 (invited keynote speaker)
- IAGC-SEPM Field Trip, Paleosols, Paleoclimate and Paleatmospheric p-CO<sub>2</sub>: Paleosols in Central Pennsylvania, 5-6 August 1993 (participant)
- SEPM 1993 Theme Meeting: Climate Eustasy and Life, 8-12 August 1993, University Park, PA (member of organizing committee and technical session convener)
- Chesapeake-Region Association of Biogeochemists (CRABS), 1st Annual Meeting, 19-20 May, 1994, Chesapeake Biological Laboratory, Solomons, MD (co-organizer)
- International Symposium on Biogeochemical Cycles and Global Change, Max-Planck-Gesellschaft, Max Planck Institute for Meteorology, Hamburg, Germany, January 16-18, 1995 (invited speaker)
- Chesapeake-Region Association of Biogeochemists (CRABS), 2nd Annual Meeting, 27-28 May, 1995, Penn State University, University Park, PA (co-organizer)
- American Chemical Society National Meeting: Isotopic and Molecular Biogeochemistry of Organic Matter In Ancient and Modern Environments, 20-24 August, 1995, Chicago, IL (symposium organizer; 37 papers)
- Geological Society of America, Organic Geochemistry Division of the Geochemical Society Symposium: Variability of Isotope Compositions in Modern and Fossil Organic Matter, 5 November 1995 (symposium co-organizer; 26 papers)
- Chesapeake-Region Association of Biogeochemists (CRABS), 3rd Annual Meeting, 24-25 May, 1996, University of Virginia, Charlottesville, VA (co-organizer; 25 papers; co-author on 3 papers)
- Gordon Research Conference on Organic Geochemistry: Organic and Isotopic Records of Paleoclimate, Plymouth, NH, 11-16 August 1996 (session chair and discussion leader)
- The 3rd Canadian Continuous-Flow Isotope Ratio Mass-Spectrometry Workshop, National Hydrology Research Institute, Saskatoon, Saskatchewan, Canada, 9-11 September 1996 (keynote speaker)
- Keynote Symposium: Linkages Among Dynamic Processes of Oceans, Continents and Atmospheres, Geological Society of America Annual Meeting, 28-31 October 1996 (invited speaker)
- Gordon Research Conference on Chemical Oceanography, 10-15 August, 1997, Meriden, NH (invited speaker; co-authored with M. Pagani and M. Arthur)
- 6<sup>th</sup> International Conference on Paleoceanography, Discussion Panel: *Details of Tertiary global cooling: is CO<sub>2</sub> still the major cause?* 23-28 August 1998, Lisbon, Portugal (invited panel member)
- Union Session: Research Opportunities in the Solid Earth Sciences: A 10-Year Vision. Advisory session for NSF and NRC in developing a long-term vision for basic research in earth sciences. AGU national meeting, December 1998, San Francisco, CA (invited speaker)
- Ocean Meeting, Biosphere 2, Oracle, AZ, July 1999 (invited participant)
- Low-Temperature Geochemistry workshop, Boston, MA, June 1999 (invited participant and co-author)
- Workshop on alkenone-based paleoceanographic indicators, Woods Hole Oceanographic Institution, October 1999 (invited participant and report co-author)

Molecular Biogeochemistry, a technical session at the Goldschmidt Meeting, May, 2001 (session organizer)

Stable Isotope Geochemistry, a short course sponsored by the Mineralogical Society of America and the Geochemical Society, November, 2001 (invited speaker and author)

History of Atmospheric CO<sub>2</sub> and its Effect on the Evolution of Plants, Animals and Ecosystems, a symposium sponsored by the David and Lucile Packard Foundation and the University of Utah, December, 2001, Snowbird, Utah (invited speaker)

Gordon Research Conference on Organic Geochemistry, Plymouth, NH, August 2002 (invited speaker)

ASTID working group for molecular and isotopic analyses of Martian regolith. University of Michigan, 10/2002 (invited speaker and workshop participant)

American Chemical Society, National Meeting, session honoring Geochemistry Division Medal recipient, J. M. Hayes, 3/2003 (invited speaker)

Weathering System Science Workshop, University of Delaware (NSF-EAR sponsored) 10/2005 (Breakout group Moderator and participant)

Archaeal Lipids, The Goldschmidt Conference, Moscow, ID, 5/2005 (Session organizer)

Workshop on *Proxy Development and Applications in Paleoceanography and Paleoclimatology*. Sponsored by the U.S. National Science Foundation (ATM, EAR and OCE), 12/2005 (steering committee member and invited speaker).

Roundtable Discussion on Life in a Material World, annual meeting, Board on Earth Sciences and Resources, NRC (organizer and moderator)

AAAS Abelson Advancing Science Seminar: Microbes, Minerals and the Environment, October 26, 2006, Washington, DC (invited speaker)

Paul W. Gast Lecture, Geochemical Society, V.M. Goldschmidt Meeting, August, 2007 Cologne, Germany (invited speaker).

International Meeting on Organic Geochemistry, Stable Isotope Applications, Torquay, England, September 2007 (session chair)

Short Course: Stable Isotopes in Biogeochemistry, held in association with the International Meeting on Organic Geochemistry, Torquay, England, September 2007 (Organizer and speaker)

Workshop on Biosignatures in Ancient Rocks, Sudbury, Ontario, Canada, September 2007; sponsored by NASA Astrobiology, the Agouron Institute and the Canadian Institute for Advanced Research (invited speaker).

Workshop on Equable Climates, Harvard University Center for the Environment, Harvard University, Cambridge, MA, 4-5 April, 2008 (invited participant).

Scientific Steering Committee, Workshop entitled: Unknown Knowns and Known Unknowns: Chemical Oceanography in a Changing World, 22-24 February, 2009; Savannah GA

Scientific Steering Committee, ISOCOMPOUND: Advances in analyses and applications of compound specific stable isotopes in ecology, ecosystem- and earth sciences; funded by the ESF network MOLTER and NSF network BASIN, 1-5 June 2009, Potsdam, Germany

Participant, and invited speaker, planning meeting and workshop for program in Astrobiology, Canadian Institute for Advanced Research (CIFAR); Toronto; 2/09

Steering Committee member and co-organizer, NSF-sponsored workshop, Future Directions in Geobiology and Low-Temperature Geochemistry, Washington, D.C., August, 2010

Invited Participant, NSF-sponsored workshop, Conservation Paleobiology, Paleontological Research Institution in Ithaca, NY, June 3-5, 2011

Invited speaker, "Hydrogen isotopes as environmental recorders: from water to sedimentary biomarkers through biological systems," LE STUDIUM conference, Institute for Advanced Studies, Orleans, France, September 15-16, 2011.

Invited speaker, Environmental Contexts of Early Human Evolution, Lamont Climate Center, Lamont-Doherty Earth Observatory, April 18-19, 2012

Session Chair, Gordon Research Conference on Organic Geochemistry, Holderness, NH, August, 2012

Participant and invited speaker, Olduvai Coring Project, Stone Age Inst., Bloomington, IN Mar. 4-6, 2014

Session Chair, the V.M. Goldschmidt Conference on geochemistry, Sacramento, CA, June 2014  
Keynote Speaker and Invited Panelist, Gordon Research Seminar, August 2-3, 2014  
Session Chair, Gordon Research Conference on Organic Geochemistry, Holderness, NH, Aug. 3-8 2014  
Invited speaker, ICDP Trans-Amazon Coring Project planning meeting, Manaus, Brazil, March 18, 2015  
Invited speaker, Plant Wax Workshop, Ascona, Switzerland, 16-20 June, 2015  
Invited keynote speaker, Marilyn Madness, a celebration of the career of Marilyn Fogel, The Carnegie Institute of Washington, Geophysical Lab, 23-25 October, 2016.  
Speaker and participant, Olduvai Coring Project team meeting, The Stone Age Institute, Bloomington, IN, 17-20 October, 2016.  
Invited participant and speaker, Workshop on early brain development, Templeton Foundation, Olduvai Gorge, Tanzania, 7-8 August, 2017.  
Science committee and session chair, International Meeting of Organic Geochemistry, Florence, Italy, Sept 17-22, 2017.  
Session discussion leader, Gordon Research Conference on Organic Geochemistry, Holderness, NH, July 29-Aug. 3 2018  
Session organizer and co-chair, V.M. Goldschmidt Meeting 2018, Boston, MA, Aug 12-17.  
Session organizer, AGU Fall meeting, Washington D.C., Dec. 10-14, 2018  
Invited Keynote Speaker, Biogeosciences Centennial Symposium, AGU Fall meeting, Washington D.C., Dec. 10-14, 2018  
Invited Speaker, ISOTOPES 2019 Raitenshaslach, Germany, 7-12 July, 2019  
Invited Keynote Speaker, Biogeosciences Centennial Symposium, AGU Fall meeting, San Francisco, Dec. 2019  
Session Chair, Gordon Research Conference on Organic Geochemistry, Holderness, NH, August, 2020 (postponed until 2022 due to COVID-19)

### **Speaking Engagements (invited; does not include professional meetings)**

School of Oceanography, University of Washington, May, 1991  
Skidaway Institute of Oceanography, University System of Georgia, September, 1991  
Department of Chemistry and Biochemistry and Department of Geology, University of Maryland, November, 1991  
Petroleum and Natural Gas Engineering, Penn State, February, 1992  
Department of Geology, University of Pennsylvania, February, 1992  
Department Earth and Planetary Sciences, Harvard University, December, 1992  
Department of Geological Science, Northwestern University, September, 1993  
Department of Earth, Atmospheric and Planetary Sciences, MIT 10/1993  
Max Planck Institute for Marine Microbiology, Bremen, Germany, January, 1995  
Finnigan MAT, Research and Development Division, Bremen, Germany, January, 1995  
Department of Geological Sciences, Cornell University, May, 1995  
Atlantic Richfield Oil Company (ARCO), Research Division, Plano, TX, October, 1995  
Department of Geography, Penn State University, October, 1995  
Department of Geology, Lehigh University, January, 1995  
Marine Science Program, University of North Carolina, Chapel Hill, February, 1996  
Department of Geology & Geophysics, Yale University, February, 1997 (series on global change)  
Department of Geology and Marine Geology & Geophysics Group, Graduate School of Oceanography, University of Rhode Island, March, 1997  
Atlantic Richfield Oil Company (ARCO), Research Division, Plano, TX, May, 1997  
Department of Geosciences, University of Minnesota, November, 1998  
Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, April, 1999  
Department of Geological Sciences, Indiana University, April, 1999

Department of Geological Sciences, The University of Chicago, May, 2000  
 Department of Geological Sciences, The University of Michigan, October, 2000 (Turner Lecture Series)  
 Department of Geology and Geophysics, University of Connecticut, November, 2000  
 Petroleum and Marine Division, Australia Geologic Survey Org., Canberra, Australia, October, 2000  
 Canadian Institute for Advanced Research, Earth System Evolution; Montreal, November, 2000  
 Canadian Institute for Advanced Research, Earth System Evolution; Toronto, 11/02  
 Department of Earth and Planetary Sciences, University of Tennessee, Knoxville, 2003 (Klepser Lecturer)  
 Department of Geological Sciences, University of South Carolina, 2003  
 College of Marine Sciences, the University of South Florida, St. Petersburg, FL, March, 2005  
 School of Earth and Atmospheric Sciences, The Georgia Institute of Technology, Atlanta, GA., 11/ 2005  
 Geophysical Laboratory, Carnegie Institute of Washington, Washington, D.C., January, 2006  
 Department of Geology, Portland State University, Portland, OR, May, 2006  
 Department of Marine Sciences, Rutgers University, March, 2007  
 College of Science, University of Arizona, Tucson, January, 2008  
 Microbial Science Institute, Harvard University, Cambridge MA, April, 2008  
 Department of Geology, Yale University (Biogeochemistry seminar), February, 2010  
 Department of Marine Sciences, University of North Carolina, April, 2010  
 Department of Geology, University of Cincinnati, April, 2010  
 National Museum of Natural History, Smithsonian Institution, 11/9/2010  
 Department of Biology, University of Utah, 2/8/2011  
 Department of Earth, Atmospheric and Planetary Science, MIT, March, 2011  
 Craig Venter Institute, San Diego, CA, Paleobiology during the Genomics Era, 5/12/2011  
 Department of Earth, Atmospheric and Planetary Science, MIT, March, 2011 (Crosby Lecture)  
 Department of Geology, Wellesley College, Wellesley, MA, 10/18/2011  
 Lamont-Doherty Earth Observatory, Columbia University, Lamont, NY, 2/19/2012  
 Origins Lecture, Department of Geology, McMaster University, Toronto, Canada, 3/12/2012  
 School of Earth and Atmospheric Sciences, Georgia Institute of Technology, 2/28/2013  
 Department of Plant Pathology, Penn State University, 2/25/2013  
 Monsanto, research division, St. Louis, MO, 5/29/2013  
 Krumbein Lecture, University of Chicago, 1/16/2014  
 Department of Geoscience, Penn State University, 1/28/14  
 Department of Geography, Penn State University, 2/21/14  
 Hewett Club Speaker, Environmental Dynamics and GeoEcology (EDGE) Institute and Department of  
 Earth Sciences Seminar, University of California, Riverside, April 1-2 2014  
 School of Earth and Space Exploration, and Department of Chemistry, Arizona State University,  
 November 5-7, 2014  
 Department of Geology, University of Adelaide, Dec. 4, 2014  
 Department of Geology, Rutgers University, 6 May 2015  
 Department of Geology, University of Washington, Seattle, WA, 28 May 2015  
 Phillips Lecture, College of Liberal Arts and Sciences, The University of Illinois, 12 November 2015  
 Department of Earth Science, Rice University, Houston, TX, 7 April 2016  
 Earth System Evolution workshop, Harvard University, Boston, MA 22 May, 2016  
 Climate and Data workshop, The Pennsylvania State University, 23 May, 2016  
 O.T. Hayward Distinguished Lecture, Department of Geosciences, Baylor University; Jan. 25-28, 2017  
 Dept. of Earth, Atmospheric, and Planetary Sciences, Purdue Univ., West Lafayette, IN, 23-24 Feb., 2017  
 Department of Geology and Geophysics, University of Wyoming, April 6-7, 2017  
 Geology Section (15) lunch talk, National Academy of Sciences, National Meeting, April 30-May 2, 2017  
 Geochemistry Forum, Department of Geosciences, The Pennsylvania State University, 9/7/2018  
 Dept. of Earth and Environmental Science, Franklin and Marshall College, Lancaster, PA, 9/28/18  
 Dept. of Chemistry, The Pennsylvania State University, University Park, PA 2/21/2019

Space Telescope Science Institute, The Johns Hopkins University, Baltimore, MD, 4/3/2019  
Dept. of Earth and Atmospheric Sciences, Indiana University, Bloomington, IN 10/22/2019  
Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, Amsterdam, Netherlands,  
10/31/2019; (cancelled due to death in my family)  
Division of Geological and Planetary Sciences, California Institute of Technology, 1/27/2020  
Department of Earth and Planetary Sciences, UC Riverside, 1/28/2020  
Department of Chemistry, Pomona College, Claremont, CA, 2/18/2020  
Keynote Speaker, Ions@work 2020; Mass Spectrometry Core, Texas A&M University, 2/21/2020  
Dept. of Earth and Environmental Sciences, Lehigh University, virtual seminar, 9/25/2020  
Distinguished Lecture Series (DLS), Dept. of Geology & Geophysics, University of Utah, 10/8/2020

## SERVICE TO THE UNIVERSITY, PUBLIC AND PROFESSION

### Service to the Pennsylvania State University

#### Service to the Department of Geosciences

1991-1998	Member, Undergraduate Program Committee
1993-1995	Member, Graduate Program Committee, Candidacy Panel
1994-1996	Alternate Representative to Dept. Executive Committee
1994	Member, Faculty Search Committee for Geochemical Record of Global Change
1995-1999	Chair, Global Change and Earth History Curriculum Committee
1996	Member, Staff Functioning Evaluation Committee
1997	Member, Search Committee for Environmental Geochemistry faculty position
1997	Member, Advisory Search Committee for Head of Geosciences Department
1997-1999	Member, Department Promotion & Tenure Committee
1997	Member, Ad Hoc Committee to evaluate appointment of S. Lvov to faculty
1997-2000	Member, Admissions Committee for graduate program in geosciences
1998	Member, Department Executive Committee
1998-1999	Member, Search Committee for Geofluids/Astrobiology faculty position
1999-2000	Member, Search Committee for C-cycle faculty position in Meteorology
1999-2001	Member, Graduate Program Committee
2000	Judge, Graduate Student Colloquium
2000-2001	Member, Search Committee for Ice and Climate faculty position in Geosciences
2000-2004	Ombudsperson, Graduate Program in Geosciences
2000-2001	Member, Promotion and Tenure Committee
2003-2004	Chair, Task Force to develop B.S. Curriculum in Geobiology
2003	Member, Search Committee for Astrobiology faculty position
2003-2004	Member, Department Executive Committee (Diversity Representative)
2004-2010	Associate Head of Graduate Programs and Research
2004-2010	Member, Department Executive Committee (as Associate Head)
2004-2007	Member, multiple <i>ad hoc</i> search committees for staff positions (Geoscience & EESI)
2008-2009	Member, Search Committee for Carbon Sequestration faculty position (Geosc & EME)
2009	Member, search committee for faculty position in Sedimentary Geology
2009, 2010	Participant, Shake, Rattle and Rocks (departmental outreach activity)
2011-2012	Member, Promotion and Tenure Committee
2011-2013	Member, Nominations Committee
2012	Instructor, summer course for high school science teachers, NASA Space Grant
2012	Member, Graduate Admissions Committee
2012-2014	Member, search committee for faculty position in Hydrogeology
2013-2014	Member, strategic planning committee
2014-2017	Graduate Program Candidacy Exams Rover
2014-present	Faculty advisor, Department Colloquium Committee
2014-2015	Ad-hoc faculty committee to address sexual harassment during geology field experiences
2016	Chair, ad-hoc postdoc applications evaluation committee
2016-2018	Member, Promotion and Tenure Committee
2018	Member, honors committee, Department of Geosciences
2017-2018	Elected member, Geosciences Executive Committee
2020-2021	Graduate Program Qualifying Exam Rover

#### Service to the College of Earth and Mineral Sciences (EMS)

1992-1994	Member, Facilities Committee
1996-2000	EMS Representative at Faculty Meetings of the College of Agricultural Sciences

2002-2003 Chair, Environment Committee and ad hoc task force on Diversity  
 2003-2004 Member, College Diversity Council  
 2004 Member, Earth and Environmental Systems Inst. (EESI) Strategic Planning Committee  
 2005 Member, EESI *ad hoc* committee on future faculty hires in Earth Science and Ecology  
 2007 Member, Search Committee for the Associate Dean for Diversity in EMS  
 2012 Member, *ad-hoc* committee on EMS college communication (SWAE)  
 2013-present Member, EMS Faculty Advisory Committee  
 2012-present EMS Faculty Ombudsman  
 2016-2017 Chair, *ad-hoc* committee to evaluate the status of women faculty in EMS  
 2016-2017 Member, search committee for faculty position in Earth Science and Ecology  
 2017-2018 Chair, search committee for Department Head of Geosciences

### **Service to the University**

1992-present Member, Marine Sciences Minor Committee  
 2000-2004 Chair, Marine Sciences Minor Committee  
 1992 Mentor, NSF-sponsored “Ms. Wiz” program for elementary school girls  
 1994-1996 Advisor, Women in Science and Engineering Research Internship Program  
 1995, 1996 Faculty Judge, Graduate Student Research Exposition  
 1999 Member, *Ad-Hoc* Committee on Recruitment of Women Scientists at Penn State  
 2002-2005 Member, Selection Committee, Faculty Scholar Medal in the Physical Sciences  
 2005 Chair, Selection Committee, Faculty Scholar Medal in the Physical Sciences  
 2008 Chair, *Ad Hoc* Task Force, Water and Energy in a Changing World  
 2008 Member, Search Committee, Director of Water Resources Research Center, PSIEE  
 2010-2016 Advisor, light-element stable isotope facility, Environmental Sustainability Laboratory  
 2016-2017 Member, search committee for Assist. VP Research  
 2017 Member, search committee for Dean of the College of Earth and Mineral Sciences

### **Service to the Profession and the Public**

#### **Service to Business and Industry**

1992 Consultant on analytical methods in environmental research for Nittany Geosciences, a hydroscience firm in State College, PA  
 1993-1995 Reviewer, geochemistry textbooks (3 total) for John Wiley & Sons, Inc  
 1995-1999 Consultant on organic and isotope geochemistry of oil-field brines, ARCO, Plano, TX  
 1996 Instructor, 2-day short course on reservoirs, seals and source rocks in rift basins, Japan National Oil Corporation, Technology Research Center, Chiba, Japan  
 2000 Consultant on molecular isotopic analyses of petroleum products; Stanford University  
 2013-present Research collaboration with ThermoFisher Scientific on isotope methods

#### **Service to U.S. Government Agencies**

1992-1994 Panel Member, National Science Foundation, Division of Ocean Sciences, Program in Chemical Oceanography  
 1995, 1997 Panel Member, National Science Foundation, Divisions of Ocean and Earth Sciences, Program in Environmental Geochemistry and Biogeochemistry  
 1998-2000 Member, Committee on Basic Research Opportunities in the Solid Earth Sciences, U.S. National Research Council  
 2000 Participant and report co-author, Workshop on Terrestrial Carbon Cycle, Division of Earth Sciences, National Science Foundation  
 2001-2003 Member, U.S. National Committee for SCOPE (Scientific Committee on Problems of the Environment); sponsored by the U.S. National Research Council

2001-2004 Member, Committee on the Origins and Evolution of Life, U.S National Research Council

2002 Panel Member, National Science Foundation, Division of Earth Sciences, Program in Geology and Paleontology

2004 Member, Chronos geochemical database working group (funded by NSF)

2005-2010 Member, Board on Earth Sciences and Resources, U.S. National Research Council

2006 Panel Member, NASA Exobiology

2008-2010 Member, Committee on the Importance of Deep-Time Geologic Records for Understanding Climate Change Impacts, U.S. National Research Council

2013 Chair and Member, NASA Exobiology Funding Proposal Review Panel

2018-present Member, NASA Astrobiology Institute (NAI) Executive Council

2018-2020 Elected representative, Class Membership Committee (CMC) for Section 15, National Academy of Science (NAS)

2019-present Member, Report Review Committee (RCC), NAS

2019-present Member, Committee on Astrobiology and Planetary Science (CAPS), NAS

### **Professional Journal Editorships**

1993-1996 Associate Editor, *Organic Geochemistry*

1996-1999 Member, Editorial Advisory Board, *Geochimica et Cosmochimica Acta*

1999-2001 Associate Editor, *Geochimica et Cosmochimica Acta*

2005-2011 Member, Editorial Board, *Geobiology*

2000-present Member, Editorial Committee, *Annual Review of Earth and Planetary Sciences*

2006-2013 Associate Editor, *Annual Review of Earth and Planetary Sciences*

2013-present Co-Editor, *Annual Review of Earth and Planetary Sciences*

*Continuing* Member editor, *Proceedings of the National Academy of Science*

### **Service to Professional Organizations**

1999 Member, Scientific Committee, 19<sup>th</sup> International Meeting in Organic Geochemistry, European Association of Organic Geochemists

1997-2000 Member, Best Paper Award Committee, Organic Geochemistry Div., Geochem. Society

1999-2001 Member, Patterson Medal Committee, Geochemical Society

2000-2006 Member, Awards Committee, European Association of Organic Geochemists

2004-2006 Vice Chairman, 2006 Gordon Research Conference in Organic Geochemistry

2006-2008 Chairman, 2008 Gordon Research Conference in Organic Geochemistry

2007-2009 Chair, Trieb's Medal award committee, The Geochemical Society

2012 Member, Joint Publication Committee, The Geochemical Society

2011-2012 Member, Geochemical Fellows selection committee

2012-2016 Chair-Elect, Chair, past-chair, Organic Geochemistry Division, The Geochemical Society

2014-2015 Member, Board of Directors, The Geochemical Society

2015-2016 Member, Honors selection committee, American Geophysical Union

2016 Member, Honors selection committee, National Academy of Science

2017 Member, Scientific Committee for IMOG 2017

### **Advisory and Review Boards**

2007- present Member, Geological Sciences Alumni Advisory Board, Department of Geological Sciences, Indiana University, Bloomington, IN

2009 Member, External Review Committee, Woods Hole-MIT Ph.D. Join Program

2009-2017 Member, MIT Corporation Visiting Committee, Department of Earth, Atmospheric and Planetary Sciences (EAPS)



- 2010-2012 Member, National Ocean Sciences Accelerator Mass Spectrometry facility (NOSAMS) Advisory Board (Committee Chair: 2012)
- 2011 Member, Evaluation Committee, Department of Earth Sciences, ETH Zurich
- 2014 Chair, External Review Committee, Department of Earth and Planetary Sciences, Northwestern University
- 2016-2018 Member, Advisory Board, the Gulf Research Program, NAS
- 2017 Member, External Review Committee, Dept. of Earth Sciences, USC, Los Angeles, CA
- 2017 Member, External Review Committee, Netherlands Royal Inst. of Ocean Science (NIOZ)
- 2018 Member, External Review Committee, Lamont-Doherty Earth Observatory, Columbia University, New York
- 2018-present Member, Advisory Board, Life Sciences, The Simons Foundation, New York, NY
- 2018-present Member, Science Advisory Committee (SAC), Royal Netherlands Institute for Ocean Research (NIOZ)

### **Membership in Professional Societies**

American Chemical Society, American Geophysical Union, European Association of Organic Geochemists, Geochemical Society, Geological Society of America, Canadian Institute for Advanced Research, American Academy of Microbiology, The Cosmos Club (Washington, DC)

### **Selected Community Service**

- 2016-2019 Elected member, Vestry, St. Andrew's Episcopal Church, State College, PA
- 2006-2019 Troop Leader, Girl Scout Troop 41374, State College, PA
- 2015-present Volunteer with "4<sup>th</sup> Fest" in the State College community