

SIPS 2023, in Honor of Nobel Laureate, Prof. Stanley Whittingham



CV of Prof. Alexandra NAVROTSKY

Professor and Director, Materials of the Universe
Arizona State University
Tempe, Arizona 85287-1604

Education:

Bronx High School of Science, 1960
University of Chicago, 1963 (B.S.)
University of Chicago, 1964 (M.S.)
University of Chicago, 1967 (Ph.D.)

Area of Specialization: Solid State Chemistry, Ceramics, Physics and Chemistry of Minerals,
Geochemistry

Professional Experience:

1967 – 1968 Research Associate, Technische Universität Clausthal, Germany, Institut für Theoretische Huttenkunde

1968 – 1969 Research Associate, Pennsylvania State University, Dept. of Mineralogy and Geochemistry

1969 – 1974 Assistant Professor, Arizona State University, Dept. of Chemistry

1970 – 1971 Visiting Research Associate, University of Chicago, James Franck Institute

1972 Visiting Scientist, Technische Universität Clausthal, Germany

1974 – 1978 Associate Professor, Arizona State University, Dept. of Chemistry

1974 Visiting Scientist, Bell Telephone Laboratories

1975 Visiting Lecturer, Massachusetts Institute of Technology

1976 Visiting Associate Professor, University of California at Berkeley

1976 – 1977 Program Director for Chemical Thermodynamics, National Science Foundation

1978 – 1985 Professor, Arizona State University, Depts. of Chemistry and Geology

1981 Visiting Professor, State University of New York at Stony Brook

1984 – 1985 Director, Center for Solid State Science, Arizona State University

1985 – 1997 Professor, Princeton University, Dept. of Geological and Geophysical Sciences, Affiliate faculty, Dept. of Chemistry, Member, Princeton Materials Institute

1988 – 1991 Chair, Dept. of Geological and Geophysical Sciences, Princeton University

1988 Visiting Summer Faculty, I.B.M., T.J. Watson Research Center

1992 – 1997	Albert G. Blanke, Jr. <u>Professor</u> of Geological and Geophysical Sciences, Princeton University
1997 – 2019	<u>Interdisciplinary Professor</u> of Ceramic, Earth, and Environmental Materials Chemistry, University of California, Davis. Appointments in Departments of Chemical Engineering and Materials Science (home department); Chemistry; Land, Air and Water Resources; Geology
2001 – 2019	<u>Edward Roessler Chair</u> in Mathematical and Physical Sciences, UC Davis
2002 – 2019	<u>Director of the NEAT ORU</u> , UC Davis
2003 – 2019	<u>Distinguished Professor</u> , UC Davis
2013 – 2017	<u>Interim Dean</u> of Mathematical and Physical Sciences, College of Letters and Science, UC Davis
2019 – present	<u>Professor</u> , School of Molecular Sciences, and School for Engineering of Matter, Transport and Energy, Arizona State University
2019 – present	Director, Materials of the Universe, Arizona State University

Professional Organizations and Honorary Societies:

Phi Beta Kappa
 Sigma Xi
 American Ceramic Society
 American Chemical Society
 American Geophysical Union
 Mineralogical Society of America
 Materials Research Society
 Geochemical Society
 National Academy of Sciences
 International Union of Pure and Applied Chemistry
 World Academy of Ceramics

Honors and Awards:

1973 – 1975	Alfred P. Sloan Fellowship
1981	Mineralogical Society of America Award, Fellow
1982 – 1983	Arizona State University, Graduate College Distinguished Research Award
1988	American Geophysical Union, Fellow
1991 – 1992	Mineralogical Society of America, Vice President
1992 – 1993	Mineralogical Society of America, President
1993	Elected to National Academy of Sciences
1995	Ross Coffin Purdy Award of the American Ceramic Society, in recognition of the most valuable contribution to ceramic technical literature, 1993
1995	Doctor Honoris Causa, Uppsala University, Sweden (Paris Geophysical Inst.)
1997	Geochemical Society, Fellow
1999	Kreeger-Wolf Visiting Scholar, Northwestern University
2000	Alexander M. Cruickshank Award, Gordon Conference
2000	Hugh M. Huffman Memorial Award, The Calorimetry Conference
2000	Ceramic Educational Council Outstanding Educator Award
2001	American Ceramic Society, Fellow
2001	American Ceramic Society, Best Paper Award of the Nuclear and Environmental Technology Division

2002 Benjamin Franklin Medal in Earth Science
 2002 Highly Cited Researchers Award, ISI Thomson Scientific
 2002 Mineralogical Society (Great Britain), Fellow
 2002 Urey Medal of the European Association of Geochemistry
 2005 Spriggs Phase Equilibria Award of the American Ceramic Society
 2006 Rossini Lectureship Award, 19th International Conference on Chemical
 Thermodynamics, Boulder, Colorado
 2006 Harry H. Hess Medal of the American Geophysical Union
 2007 Sloan Faculty Distinguished Service Award - University of California, Davis
 2007 Outstanding Engineering Senior Career Research Award - University of
 California, Davis
 2008 Honorary Professor at School of Environmental Sciences and Urban Studies,
 Shenzhen Graduate School, Peking University, China
 2009 Roebling Medal of Mineralogical Society of America
 2009 Best University Paper Award, DOE Geoscience Grantee Meeting
 2009 Honorary Professorship, Sichuan University, China
 2009 International Union of Pure and Applied Chemistry, Fellow
 2011 Elected to American Philosophical Society
 2011 Featured Manuscript in the Journal of the American Ceramics Society -
 Thermochemistry of Lanthana- and Ytria-Doped Thoria
 2012 Honorary Professor, Three Gorges University, Yichang China
 2012 Cecil and Ida Green Senior Fellowship at the Geophysical Laboratory of the
 Carnegie Institute of Washington
 2016 Victor M. Goldschmidt Award, Goldschmidt Conferences, Geochemical Society
 2016 W. David Kingery Award, American Ceramic Society
 2017 World Academy of Ceramics, Elected to Science Professional Member
 2020 Jan Czocharlski Award, European Materials Research Society
 2020 Journal of the American Ceramic Society, Best Paper Award for paper entitled
 "Thermodynamic Investigation of Lithium Borate Glasses and Crystals."
 2020 American Ceramic Society, Distinguished Life Member
 2020 Sigma Xi, Full Member
 2020 Ranked #25 globally in materials science in "Updated science-wide author
 database of standardized citation indicators," published in PLOS BIOLOGY
 2020 Best Oral Presentation (presented to Dr. Khansaa Al-Essa) for group paper
 entitled "Drop Solution Calorimetric Studies of Interface Enthalpy of Cubic
 Silver (I) Oxide (Ag₂O) Nanocrystals," work done in Navrotsky lab, 4th
 International Conference on Materials Sciences and Nanomaterials

Service:

1976 – 1985 Physics and Chemistry of Minerals, Advisory Board
 1977 – 1979 NASA: Subcommittee on Materials Processing in Space
 1979 – 1981 NSF: Advisory Committee, Division of Materials Research
 1980 Co-organizer, Conference on Structural Chemistry of Complex Solids, Castle Hot
 Springs, Arizona
 1980 – 1987 Calphad Journal, Advisory Board
 1981 National Science Foundation, Chair, Ad Hoc Oversight Review of Solid State
 Chemistry Program
 1981 – 1983 American Mineralogist, Associate Editor
 1981 – 1985 National Academy of Sciences, Committee on High Temperature Chemistry
 1981 – 2000 Advances in Physical Geochemistry, Advisory Board

1982 Co-organizer (with P. Day) of U.S.-U.K. Workshop on Solid State Chemistry, Oxford, England

1982 – 1985 Councilor, Mineralogical Society of America

1983 – 1993 American Geophysical Union, Committee on Mineral Physics

1983 National Science Foundation, Panel on Visiting Professorship for Women

1983 – 1985 Mineralogical Society of America, Chair of 1984 MSA Award Committee, Chair of 1985 Mineralogy-Petrology Grant Committee

1984 National Science Foundation, Workshop on Materials Chemistry

1985 Co-organizer (with S. W. Kieffer) of Mineralogical Society of America Short Course, "Microscopic to Macroscopic - from Atomic Environments to Thermodynamic Properties," May 1985, Chestertown, MD

1985 – 1991 North American Editor, Physics and Chemistry of Minerals

1985 – 2000 Progress in Solid State Chemistry, Editorial Advisory Board

1986 – 1989 Stanford University, Earth Sciences Advisory Board

1986 – 2000 Series Editor, Oxford Monographs on Geology and Geophysics

1987 Convener, American Geophysical Union Chapman Conference on "Perovskite - A Structure of Great Interest to Geophysics and Materials Science," Bisbee AZ, October 1987

1988 Geophysical Laboratory, Carnegie Institution of Washington, Advisory Committee

1988 Local Organizing Committee, 11th International Symposium on the Reactivity of Solids, Princeton, NJ, June 1988

1989 – 1992 National Science Foundation, Advisory Committee on Earth Sciences

1990 – 1993 MIT Earth Sciences Advisory Committee

1990 National Science Foundation, Earth Sciences, Committee of Visitors, Geochemistry Program, Chair

1990 American Geophysical Union Fall Meeting, Symposium Convener "Mineral Physics of Materials, Near the Earth's Surface"

1991 – 1994 Harvard University, Department of Earth and Planetary Sciences, Visiting Committee

1991 National Science Foundation, Earth Sciences Committee of Visitors, Instrumentation, Chair

1991-1992 NSF Science and Technology Center for High Pressure Research (CHiPR), Executive Committees

1991 California Institute of Technology, Division of Geological Sciences, Visiting Committee

1992 Columbia University, Geological Sciences, Visiting Committee

1992 Spring American Geophysical Union Meeting, Symposium Co- Convener, "What Do We Really Know About the Mantle?"

1993 – 1994 Department of Energy Basic Energy Sciences Advisory Committee (BESAC)

1993 – 1996 American Geophysical Union, Bowie Medal Committee, Chair, 1996

1994 Convener, CSEDI Workshop on Mantle Models, North East, Maryland, May 1994

1995 Mineralogical Society of America, Roebling Medal Committee

1995 – 1997	NRC Board on Earth Sciences and Resources
1995	Organizer, Symposium on Mineral Thermodynamics, Goldschmidt Conference, State College, PA, May 1995
1995 – 1997	National Science Foundation, Geochemistry Panel
1996	National Science Foundation, MRSEC Panel
1996 – 1997	Review Committee for Institute of Geophysics and Planetary Physics (IGPP), University of California
1996 – 1997	Natural Materials Advisory Board Committee on Advanced Fibers for High Temperature Ceramic Applications
1996 – 1998	Organizing Committee, 12th International Zeolites Congress, Baltimore, MD, July 1998
1997	National Science Foundation, Earth Sciences Advisory Committee
1997	National Science Foundation, Earth Sciences Committee of Visitors, Instrumentation and Facilities Program, Chair
1998 – 2000	Journal of Materials Research, Principal Editor
1998	Arizona State University, MRSEC Advisory Committee
1998 - 1999	Geochemical Society, Board of Directors
1999 – 2005	Los Alamos National Laboratory, Earth and Environmental Science Divisional Review Committee
1999 – 2003	Sandia National Laboratory, Geoscience Advisory Committee
1999	Workshop on Mineral and Rock Physics, Organizer, Scottsdale, AZ, May 28-30, 1999
2000 – 2001	13th International Zeolite Conference, International Advisory Board, Montpelier, France
2000 – 2001	BES (Basic Energy Sciences), Council on Chemical Sciences
2001 – 2005	Los Alamos National Laboratory, Nuclear Materials Technology Division, Divisional Review Committee
2001	Co-organizer, Mineralogical Society of America Short Course on Nanoparticles in the Environment
2001	Co- Convener, Materials Research Society Symposium on Perovskites
2002	Co-organizer, NSF/DOE Workshop on Nanogeoscience
2002 – 2004	NRC Committee on Advanced Geochemical Methods for Managing Carbon
2002 – 2004	Science, Board of Reviewing Editors
2002 – 2003	Geochemical Society F.W. Clarke Award Committee
2003	Participant and Group Leader, USDA Workshop on Defining Agriculture Opportunities in Nanotechnology
2003 – 2008	Chemistry of Materials Editorial Advisory Board
2003 – 2004	Member, Nanotechnology Technical Advisory Group (TAG) for President's Council of Advisors on Science and Technology (PCAST)
2003 – 2006	Advisory Board, Environmental Molecular Science Institute, Notre Dame University

2005	Organizing Committee: International Conference on Perovskites – Properties and Applications
2006 – 2016	Science and Technology Committee, Los Alamos National Laboratory
2006	Phase Equilibria Program and Spriggs Phase Equilibria Award Subcommittees, The American Ceramic Society
2006 – 2008	Honors and Recognition Committee, American Geophysical Union
2006 – 2009	Finance Committee, Mineralogical Society of America
2006	Geo2000 – Geosciences Futures Committee, National Science Foundation
2007	Advisory Board Member of the 15th International Zeolite Conference, Beijing, China (15th IZC)
2007	Local Organizing Committee, XVIth International Symposium on the Reactivity of Solids, University of Minnesota
2007 – 2018	External Advisory Board, Delaware EPSCoR Research Infrastructure Improvement Program and the Center for Critical Zone Research
2007 – Present	“Master Scientist” on China III, Project with Sichuan University, Chengdu, China, Mountain Resources Engineering and Ecological Security
2008 – 2016	Science and Technology Committee, Los Alamos National Laboratory
2008 – 2011	AGU Honors and Recognition Committee
2009	Organizer, HTMC XIII, IUPAC Conference on High Temperature Materials Chemistry, Davis CA, Sept 2009
2009 – 2016	Science and Technology Committee, Lawrence Livermore National Laboratory
2009 – 2018	DOE Energy Frontier Research Center- Materials Science of Actinides, Executive Committee
2009 – 2014	DOE Energy Frontier Research Center- Nanoscale Controls on Geologic CO ₂ , P.I. Committee
2009 – 2018	DOE Energy Frontier Research Center on Extreme Environments, Advisory Board
2009 – 2014	DOE Energy Frontier Research Center on Fluid Interface Reactions, Structures, and Transport (FIRST), Advisory Board
2009 – 2014	DOE Energy Frontier Research Center for Inverse Design, Advisory Board
2010	UC Davis Chancellor’s Blue Ribbon Committee on Research
2013 – 2014	International Program Committee member, Thermo of Mineralogy and Mineral Physics, 2014 Goldschmidt Conference
2015 – 2018	DOE Energy Frontier Research Center for Next Generation of Materials by Design: Incorporating Metastability, Advisory Board
2016	NSF Ceramics Program, Workshop on High Temperature Materials
2017	DOE Nuclear Energy (NE) Workshop on Molten Salt Reactors, Breakout Lead
2017	DOE Office of Science, Basic Research Needs in Future Nuclear Energy, Panel Lead
2017 - 18	NAS Committee on the Independent Assessment of Science and Technology for the Department of Energy Defense Environmental Cleanup Program

- 2018 - 19 University of California Presidential Appointee to the Board of Directors of the California Council on Science and Technology (CSST)
- 2018 - Present American Chemical Society, Editorial Advisory Board for *ACS Earth and Space Chemistry*

Major Invited Lectures:

- 1985 Mineralogical Society of America, Short Course on Microscopic to Macroscopic
- 1986 Hoots Lecture, Stanford University
- 1986 Mineralogical Society of America, Short Course on Silicate Melts
- 1987 Mineralogical Society of America, Short Course on Thermodynamic Modeling
- 1992 Gordon Conference on Molten Metals and Melts
- 1995 Gordon Conference on Solid State Chemistry
- 1995 Gordon Conference on Zeolites
- 1995 Eyring Lectures, Arizona State University
- 1995 Mineralogical Society of America, Short Course on Silicate Melts
- 1996 NATO Advanced Study Institute on Actinides and the Environment
- 1996 50 Years of Materials Science at University of Pennsylvania Symposium
- 1996 Gordon Conference on High Temperature Chemistry
- 1997 Gordon Conference on Liquids
- 1998 Gordon Conference on Disordered Materials
- 1999 Kreeger-Wolf Lecture at Northwestern University
- 2001 Alexander M. Cruickshank Lecturer, Gordon Conference on High Temperature Materials
- 2002 Mineralogical Society of America Short Course on Nanoparticles in the Environment
- 2002 Franklin Medal in Earth Science Lecture
- 2003 Elizabeth C. Crosby Lecture Series, Materials Science and Engineering, University of Michigan
- 2004 Gordon Conference on Solid State Chemistry I
- 2004 Hassel Lecture, Norwegian Chemical Society, Oslo, Norway
- 2004 Gordon Conference on High Temperature Materials
- 2004 Gordon Conference on Ceramics
- 2004 University of Minnesota, Women in Science Lectures
- 2005 Goldschmidt Conference on Geochemistry, Urey Award Lecture
- 2005 Wohl Lecture, University of Delaware
- 2007 "The Nuclear Fuel Cycle: Fundamental Thermodynamic and Solid State Chemical Questions after Sixty Years," The Leroy Eyring Center for Solid State Science, Arizona State University
- 2008 Plenary Lecture: The 5th International Workshop on DV-X α : The Advanced Related Experiments and Theories on Materials Science and X-ray

Spectroscopy & the 21st Annual Meeting of the Society for DV-X α Japan,
Himeji, Japan.

2008 "Environment, Energy, Nanoscience," Working on Environmental Sciences in the
21st Century, Peking University, Beijing, China

2008 Plenary Lecture at the VII Brazilian Material Research Society Meeting

2009 Roebling Medal Lecture, Mineralogical Society of America

2010 Gordon Conference on High Temperature Materials, Processes, and
Diagnostics, Colby College, ME

2010 Gordon Research Conference: High Temperature, Materials, Processes and
Diagnostic, Waterville, ME

2010 Gordon Conference on Ceramics, Solid State Studies, Colby Sawyer College,
NH

2011 SSI-18 International Conference on Solid State Ionics, Warszawa, Poland
(invited lecture)

2011 Gordon Conference on Nanoporous Materials and Their Applications,
Holderness, NH

2011 The 1st Central and Eastern European Conference of Thermal Analysis and
Calorimetry Conference, Craiova, Romania, Plenary Lecture

2011 MS&T 2011 Conference, Columbus, OH

2011 Outstanding Women in Science Lecture, Indiana University, Bloomington, IN

2012 Invited Lecture, Los Alamos National Laboratory

2012 Cecil and Ida Green Lecture, Geophysical Laboratory of the Carnegie Institution
of Washington

2013 Seaborg Lecture, Lawrence Berkeley National Laboratory

2013 William Mong Distinguished Lecture, University of Hong Kong

2013 Invited Lecture, International Conference of Physical Chemistry, Bucharest
Romania

2013 Alfred R. Cooper Distinguished Lecture, The American Ceramic Society, MS&T
2013 Conference, Montreal, Quebec

2015 Symposium X – Frontiers of Materials Research Invited Speaker, "Energetics at
the Nanoscale: Impacts for Geochemistry, the Environment, and Materials"
Materials Research Society Spring Meeting

2016 Goldschmidt Award Lecture

2017 Institut de Chimie Séparative de Marcoule, France, Invited Lecture

2018 Master Distinguished Lecture, Shanghai Jiao Tong University, China

2018 CALPHAD 18 Conference, Mexico

2018 Goldschmidt Conference Keynote Speaker

2019 Heriot-Watt University, Edinburgh, Scotland, Invited Lecture

2019 Seaborg Seminar, Los Alamos National Laboratory

2019 Plenary Lecture, 14th International Conference on the Structure of Non-
Crystalline Materials, Kobe, Japan

- 2020 Plenary Lecture, International Conference on Thermal Analysis and Calorimetry, Moscow, Russia (moved online due to COVID)
- 2020 Keynote, Materials Science and Engineering Congress, Darmstadt, Germany (moved online due to COVID)
- 2020 Invited Talk, Women of Distinction in Materials Science Online Workshop, Darmstadt, Germany

Patents:

“Removal of Organic Structure Directing Agents from Inorganic Nano-Composite Materials,”
A. Navrotsky, A. N. Parikh, U.S. Pat. Appl. Publ., 17pp. (2004).

U.S. Patent No. 6,960,327 (Issued: November 1, 2005)
“Methods for Removing Organic Compounds from Nano-Compositic Materials”
(UC Case No. 2003-121-1)

U.S. Patent No. 7,141,857 (Issued: November 28, 2006)
“Semiconductor Structures and Methods of Fabricating Semiconductor Structures Comprising Hafnium Oxide Modified with Lanthanum, a Lanthanide-Series Metal, or a Combination Thereof”

