# CURRICULUM VITAE

**Thomas W. Peterson**
Provost and Executive Vice Chancellor
University of California
Merced, CA 95348

## EMPLOYMENT

### UNIVERSITY OF CALIFORNIA
MERCED, CALIFORNIA
Provost and Executive Vice Chancellor
December 2012 to present

As Provost and Executive Vice Chancellor I am responsible for the planning, development and implementation of academic initiatives, as well as the infrastructure to support campus academic objectives. I work closely with members of the Academic Senate, who are the primary authors of these initiatives, in defining the strategic directions for the campus. Among the broad array of campus administrators reporting to my office are the Deans of the Schools of Engineering, Natural Sciences and Social Sciences, Humanities and Arts; Vice Provost and Dean of Graduate Education; Vice Provost and Dean of Undergraduate Education, Vice Provost for the Faculty, University Librarian and Chief Information Officer. The Provost and Executive Vice Chancellor also is responsible for the Academic Personnel Office, and UC Merced's educational outreach centers.

### NATIONAL SCIENCE FOUNDATION
ARLINGTON, VIRGINIA
Acting Chief Operating Officer, June-October, 2010
Assistant Director, Engineering Directorate
January 2009 to December 2012

NSF, a $7B agency, provides critical support for the nation's engineering research and education activities, and is a driving force behind the education and development of the nation's engineering workforce. I led the Engineering Directorate which, with a budget of approximately $700 million, supports fundamental and transformative research, the creation of cutting edge facilities and tools, broad interdisciplinary collaborations, and through its Centers and Small Business Innovation Research programs, enhances the competitiveness of U.S. companies.

I also served as Acting COO for NSF, under Acting Director Cora Marrett, in the interim period between the departure of Director Arden Bement and the Senate Confirmation of Director Subra Suresh. In that capacity, I handled numerous NSF-internal issues, primarily in the human resources, contracting and procurement, and budget areas.

New NSF and agency-wide initiatives in which I played a key role included Science Engineering and Education for Sustainability (SEES), Innovation Corps, the National Robotics Initiative and the Advanced Manufacturing Partnership.

**UNIVERSITY OF ARIZONA**
TUCSON, ARIZONA
COLLEGE OF ENGINEERING
Dean, January 1998 to January 2009

I was responsible for 18 undergraduate and 15 graduate degree programs in eight departments with state budget of $18 million and external research support of $30 million annually. Our Philanthropic support exceeded $20M in the final four years. I encouraged significant expansion of collaborations with Business, including undergraduate Engineering Management program and Technology and Management activities. Expanded collaborative Optical Engineering program with Optical Sciences and Biomedical Engineering program with Medicine.

CHEMICAL and ENVIRONMENTAL ENGINEERING DEPARTMENT
August 1977 to January 2013
Department Head: March 1990 to December 1997

I was responsible for academic, programmatic and financial aspects of an academic unit offering undergraduate and graduate engineering degrees. The department consisted of 12 faculty, approximately 70 graduate students and 275 undergraduate students. I oversaw the merger of chemical engineering and environmental engineering into one academic unit, initiated named graduate degrees (MS and PhD) in environmental engineering, recruited and hired 8 faculty members, and provided departmental support for a multi-university, multi-department NSF Engineering Research Center in *Environmentally Benign Semiconductor Manufacturing*.

Professor: August 1987 to January 2013
Associate Professor: August 1981 to August 1987
Assistant Professor: August 1977 to August 1981

Established research in particulate air pollutants, atmospheric modeling and analysis, source sampling, and chemical characterization, combustion generated aerosols, optical heterodyne techniques for particle size measurement, and aerosol behavior in clean-rooms and plasmas. Supervised graduate research for Ph.D. and M.S. students.

Developed and taught graduate/undergraduate courses in air pollution, aerosol science, microelectronics manufacturing, engineering analysis, transport phenomena, reaction engineering, process control and introductory chemical engineering.

**MOTOROLA**
MESA and CHANDLER, ARIZONA
SEMICONDUCTOR PRODUCTS SECTOR
January 1996 to July 1996

During sabbatical leave I further developed a research program and industrial interaction in the area of environmentally benign semiconductor manufacturing. I collaborated with scientists and engineers on projects to develop new processes to reduce use of photolithography chemicals and ultrapure water in semiconductor manufacturing.

**UNIVERSITY OF DUISBURG**
DUISBURG, GERMANY
PROCESS AND AEROSOL MECHANICS LABORATORY
July 1987 to September 1987

I was Guest scientist, funded by Sonderforschungsbereich 209, to collaborate with Prof. Heinz Fissan, Director. I Developed and compared model predictions for particle behavior in clean-rooms.

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY**
CAMBRIDGE, MA.
CHEMICAL ENGINEERING DEPARTMENT
July 1984 to January 1985

During sabbatical leave I collaborated with Prof. Adel Sarofim in area of combustion-generated aerosols. I developed a model framework for describing particle fragmentation during pulverized coal combustion.

**SANDIA NATIONAL LABORATORIES**
ALBUQUERQUE, NM.
Summer 1981

As Faculty Summer Consultant, I analyzed results from experimental study of high temperature plutonium aerosol formation. I developed framework for theoretical modeling of chemistry and thermodynamics of the system, and proposed areas for future experimental and theoretical work.

## RESEARCH OBJECTIVES

Fundamental study of particulate contaminants in processing and formation of particulate pollutants (aerosols). The major areas include 1) experimental study of contaminant particle formation in plasma reactors, 2) examination of the effects of combustion modifications on particle formation in coal combustion and 3) evolution of trace metal contaminants in high temperature processes.

Work in plasma reactors has utilized optical emissions spectroscopy and mass spectrometry to characterize particle precursors in plasmas, laser doppler methods to characterize particle velocity distributions and extractive methods for particle chemical characterization. Work in source-related aerosols includes study of the chemistry and physics of combustion-generated particles, effects of staged combustion on particle formation in coal furnaces and modeling of aerosol mechanics at high temperature.

## EDUCATION

| | |
|---|---|
| 1977 | Ph. D. California Institute of Technology |
| 1973 | M. S. University of Arizona |
| 1972 | B. S. Tufts University (Magna Cum Laude) |
| | (All three degrees in Chemical Engineering) |

## HONORS AND AWARDS

Doctor of Philosophy, Honoris Causa, University of Arkansas, Little Rock 2010
Fellow of the American Institute of Chemical Engineers, 2004
Kenneth Whitby Award, American Association for Aerosol Research, 1986
Tau Beta Pi (since 1970), Sigma Xi (since 1975)

## SELECTED EXTERNAL ACTIVITIES AT NATIONAL SCIENCE FOUNDATION

*Interactions with Executive Office of the President, including White House Office of Science and Technology Policy (OSTP), National Economic Council (NEC)*

Member, Committee on Technology, 2009-2012
National Science and Technology Council (NSTC)
Member, Committee on Homeland and National Security, 2011-2012
National Science and Technology Council (NSTC)
Regional Innovation Cluster Interagency Working Group, 2009-10
National Robotics Initiative, 2010-2012
Advanced Manufacturing Partnership (AMP), 2010-2012

*Testimony and Interactions with the Congress*

"Engineering in K-12 Education", Testimony to Committee on Science and Technology, Subcommittee on Research and Science Education, U.S. House of Representatives, October 22 2009.

"From the Lab Bench to the Marketplace: Improving Technology Transfer", Testimony to Committee on Science and Technology, Subcommittee on Research and Science Education, U.S. House of Reps., June 10 2010.

"The Innovation Corps Program: One tool in the NSF Innovation Ecosystem Arsenal", Testimony to Committee on Science, Space, and Technology, Subcommittee on Research and Science Education, U.S. House of Representatives, Field Hearing, Northwestern University, Chicago IL, July 16, 2012.

"Keeping America Secure: The Science Supporting the Development of Threat Detection Technologies", Testimony on Physical Threats to Committee on Science, Space, and Technology, U.S. House of Representatives, Washington DC, July 19, 2012.

"Investing in America's Future", Coalition for National Science Funding R&D Caucus, Gold Room, Rayburn Building, June 24 2010.

"Science Means Innovation", Coalition for National Science Funding R&D Caucus, Rayburn Building March 29 2012.

*Interactions with other Federal Agencies*

Department of Commerce (DOC) - University Innovation Fora

"Catalyzing University Research for a Stronger Economy", Washington, DC Feb 24, 2010

"University Innovation Forum", Los Angeles, CA, July 8, 2010

"University Innovation Forum", Atlanta, GA, July 15, 2010

Department of Energy

NSF-DOE Energy Engineering Research Center Program 2010-present

NSF-DOE Joint Program on Thermo-Electric Efficiency, 2009-10

National Institutes of Health

*Interactions with International Counterparts*

*State Department- sponsored meetings*

Franco-American Commission on Science and Technology, Paris June 11-12, 2009. Primary focus on nanotechnology and energy.

New Zealand -American Commission On Science and Technology, Wellington, NZ, January 25-26, 2010. Primary focus on renewable energy and smart-grid technologies.

India-American Commission On Science and Technology, Washington, D.C., June 24 – 25, 2010. Primary focus on innovation.

Ireland-Northern Ireland-US Research Steering Group, Dublin, October 31, 2011. Primary focus on nanotechnology, energy, telecommunications and sensors.

*International Science and Engineering Agency Meetings*

NSF Science and Engineering mission to Russian Foundation for Basic Research and Russian Academy of Sciences, Moscow and St. Petersburg, Nov 9-12, 2009. Primary focus on nanotechnology and climate change.

NSF-DoE-New Zealand dedication of wind turbine generators for McMurdo Station and Scott Base, Antarctica. Participated with Undersecretaries Koonin and

Johnson, as well as Secretary Wayne Clough of Smithsonian Institution. Visit to South Pole station, January 21-24, 2010.

Substantial and regular interactions with Deutsche Forschungsgemeinschaft (Germany), Research Councils United Kingdom, National Research Council Canada, Centre National de la Recherche Scientifique (France), Science Foundation Ireland, Invest Northern Ireland, National Science Foundation China, Japan Ministry of Education, Russian Foundation for Basic Research, among others.

## SELECTED ACTIVITIES IN ACADEMIA

*Engineering Deans' Council of ASEE*
Vice-Chair, Engineering Deans' Council, 2007-2009
Member, Executive Committee, 2005-2009
Industry-University Partnership Task Force, 2006-2007
Technical Program Chair, Eng'g Deans' Institute, 2005
Task Force on Future of Engineering, 2004-2005
Public Policy Forum Committee, 2003-20007
Data Collection Committee, 2003-2009
Program Committee, Engineering Deans' Institute, 2002, 2005, 2007

*American Society for Engineering Education (ASEE)*
International Advisory Committee, 2006-2008
Awards Contact Committee, 2005-2007

*Accreditation Board for Engineering and Technology (ABET)*
Board of Directors, 2013-present
Alternate, Board of Directors, 2006-2012
Engineering Accreditation Commission, 2000-2005
Chemical Engineering Evaluator, 1993-present

*American Institute for Chemical Engineers (AIChE)*
Education and Accreditation Committee, AIChE, 1997-present
Awards Subcommittee, 1995-96

*Council for Chemical Research*
Board of Directors, 2003-2006
Awards Committee, 1997-2000, Chair 1998-2000

*American Association for Aerosol Research*
Board of Directors, 1991-1995
Chairman, Awards Committee, 1990-1993
Long-Range Planning Committee, 1987-1990
Program Committee, l985 Annual Meeting

*American Chemical Society*
Chairman, Symposium on Ash Chemistry and Physics, Atlanta, April 1991
Program Chairman, Winter Symposium on Aerosol Systems, 1981.

*Service to Government Agencies*

*Lawrence Berkeley National Labs* Site Review Team for Environmental Energy Technologies Division, September 2006.
*National Science Foundation*, Reviewer for Academic Research Infrastructure, Industry/University Cooperative Research Program, IGERT, and other programs, 1981-present
*Environmental Protection Agency*, Reviewer for Air Quality Peer Review Program, LIMB R&D, and other programs, 1985-1999.
*Department of Energy*, Reviewer Flue Gas Cleanup Program, 1989.
*National Research Council*, Panel Review, Environmental Protection, Safety and Hazardous Materials – Committee on Chemical Engineering Frontiers, 1985, External Reviewer of Ozone and Particulates Reports, 1995-2002.

*Service to Other Academic Institutions*

State of Utah Board for Higher Education, review of statewide engineering programs 2008
Tufts University, Advisory Council for Department of Chemical and Biomolecular Engineering, 2004 – 2008.
Illinois Institute of Technology, Chemical and Environmental Engineering Advisory Committee, 1999-2004
MIT/CalTech/NJIT Science Advisory Committee, EPA Center for Airborne Organics, 1992-2002
University of Kentucky, External Review of Center for Applied Energy Research, 1988.

**UNIVERSITY/STATE SERVICE ACTIVITIES**

Member, Tuition Task Force, 2008
Co-Chair, Search Committee for Associate Provosts for Academic Affairs, Faculty Affairs, 2008
Member, Strategic Planning and Budgeting Advisory Committee, 2007-present
Chair, Search Committee for Eller College Dean, 2003-2004
Member, Board of Directors, Campus Research Corporation, 2004-2006
Member, Board of Directors for Flandrau Science Center, 2001-present
Member, Honorary Degree Selection Committee, 2003-2005
Chair, Five-year Review Committee for the Dean of the Eller College of Business and Public Administration, 2001-2002
Chair, Management Team for Prop 301 Initiative in Internet Technology Commerce and Design Institute, 2000-2005
Member, *Search Committee for President of UA Alumni Association*, 2001
Member, *Provost Search Committee*, 2000
Chair, *Search Committee for Dean of Science*, 2000
Member, *University Compensation Advisory Team, 1999-2003*
Member, *Provost's Faculty Workload Council*, 1997
Chair, *Department Head Search Comm., Electrical and Computer Engineering*, 1996-97
Member, *Academic Program Review Committee, Chemistry*, 1997
Participant, *Leadership Development Program, Center for Creative Leadership*, 1997
Member, *Career Services Assistant Director Search Committee*, 1995

Member, *University Human Resources Design Team,* 1994-1995
Member, *College Committee on Consulting Policy/Conflict of Interest,* 1995
Member, *Provost's Teaching Award Selection Committee,* 1994-1995
Member, *Provost's Faculty Advisory Group on Scholarships and Waivers,* 1995
Member, *Joint Arizona Center for Manufacturing Education and Training (JACMET)*
Environmental Health and Safety Group, 1995-1999.
Chair, *Space Engineering Research Center Sunset Review Committee,* 1995
Chairman, *University Environmental Quality Committee*, 1994-1996
Member, *State of Arizona Air Pollution Control Hearing Board*, 1993-2000
*Environmental Technology Industry Cluster, Governor's Strategic Partnership for Economic Development (GSPED),* Executive Committee, 1992-1993
*Board of Directors,* 1993-1998
*Technical Advisory Board,* Targeted Industry Study, 1993-1994
*Education Committee Chair,* 1993-1998
Participant, *President's Quality Leadership Forum*, Spring 1994
Participant, *Tri-University Total Quality Forum*, May 1994
Member, *College Committee on Recruitment and Retention*, 1994-1995
Member, *Board of Directors, Arizona Alumni Association*, 1992-1998
Member, *President's Advisory Committee on Merger of Chemical and Environmental Engineering*, 1992
Member, *College Strategic Long Range Planning Committee*, 1992-1994
Judge, *Southern Arizona Regional Science and Engineering Fair*, 1992-1998
Mentor, *Flinn Scholar Program*, 1987-2000
Member, *College Committee on Quality Undergraduate Education,* 1991-92
Member, *President's Task Force on Undergraduate Education*, 1991-92
Member, *Aerospace/Mechanical Engineering Department Head Search Committee*, 1992
Chairman, *Chemical Engineering Faculty Search Committee*, 1991
Member, *Ag and BioSystems Engineering Department Head Review Committee*, 1991
Program Co-Chair, *Chemical Engineering 30th Anniversary Workshop on Industrial/University Interactions*, 1991
Member, *Clean Air Task Force*, 1988-1991
Member, *Extractive Metallurgy Search Committee,* 1988-1989
Member, *College Dean's Advisory Committee,* 1985-1990
Member, *College Graduate Studies Committee*, 1986-1988
Member, *Graduate Study Committee*, 1978-1984, 1985-1989
Chairman, *Graduate Study Committee,* 1982-1984, 1986-1988
Chairman, *College of Mines Computing Committee*, 1981-1984
Chairman, *Chemical Engineering Department Head's Search Committee,* 1982-83. Member, 1981,1990
Member, *Chemical Engineering Department Faculty Search Committee*, 1981
Department Representative, *DOE-Minorities in Technology and Engineering (MITE) Program*, Summer 1980
Speaker, *Pima County Developmental Career Guidance Project*, 1978-1979
Advisor, *Tau Beta Pi*, 1978-1983, 1989-1991
Chairman, *High School-Community College Relations Committee,* 1977-1979

## PAST/CURRENT PROFESSIONAL SOCIETY MEMBERSHIPS

American Association for Aerosol Research
American Institute for Chemical Engineers
American Chemical Society
American Society for Engineering Education
Combustion Institute
Council for Chemical Research
Gesellschaft fur Aerosolforschung

## COURSES TAUGHT

Ch.E. 102 -- Introduction to Chemical Engineering
Ch.E. 202 -- Introduction to Engineering Analysis
Ch.E. 305 -- Transport Phenomena
Ch.E. 307 -- Chemical Engineering Science Laboratory
Ch.E. 402 -- Intermediate Engineering Analysis
Ch.E. 413 -- Process Control
Ch.E. 415/515 - Microelectronics Manufacturing and the Environment
Ch.E. 451/551 -- Physical and Chemical Fundamentals of Air Pollution
Ch.E. 502 -- Advanced Engineering Analysis
Ch.E. 420/520 -- Chemical Reaction Engineering
Ch.E. 560 -- Fundamentals of Aerosol Dynamics
ENGR 101/102 – Introduction to Engineering Design (*I taught the Ethics section*)

## GRADUATE STUDENTS SUPERVISED

| | | |
|---|---|---|
| Srinivas Raghavan | MS | (December 2001) |
| Michael Schabel | MS | (July 1997) |
| | PhD | (December 1999) |
| Greg Romas | MS | (May 1998) |
| Omid Mahdavi | MS | (December 1997) |
| Mary Garrity | PhD | (December 1997) |
| Larry Bool | PhD | (October 1993) |
| Mark Scotto | PhD | (December 1992) |
| | MS | (June 1988) |
| Neal Gallagher | PhD | (June 1992) |
| Kevin Sannes | MS | (June 1989) |
| Ehud Levin | MS | (September 1986) |
| William Linak | PhD | (September 1985) |
| | MS | (June 1980) |
| Jeffrey Hagen | MS | (June 1983) |
| Donald Pettit | PhD | (June 1983) |
| Roderick Beittel | MS | (November 1981) |
| Pradeep Saxena | MS | (August 1980) |
| Henry Cauley | MS | (February 1980) |
| Richard Beyak | MS | (June 1979) |

## TECHNICAL REVIEWS

Journals

Aerosol Science and Technology
Atmospheric Environment
Canadian Journal of Chemical Engineering
Chemical Engineering Science
Chemical Engineering Education
Computers in Chemical Engineering
Environmental Progress
Environmental Science & Technology
IEEE Transactions of Semiconductor Manufacturing
Journal of Aerosol Science
Journal of American Institute of Chemical Engineers
Journal of Chinese Institute of Chemical Engineers
Journal of Colloid and Interface Science
Journal of the Electrochemical Society
Journal of Fluid Mechanics
Progress in Energy and Combustion Science
Powder Technology
Science
Society for Computer Simulation

Books

Butterworth, Inc.
Prentice Hall
John Wiley and Sons

Proposals

Department of Energy
Environmental Protection Agency
Kentucky NSF EPSCoR Program
Maryland Academy of Sciences
Missouri Research Assistance Act Fund
National Research Council, the National Academies
National Science Foundation
Ohio Board of Regents

## CONSULTING

AZ Department of Health Services 1978-81, 1997
Cities Service Company 1978
Chadbourne ESP, Inc. 1995-96
Environmental Protection Agency 1979-80
Energy & Environmental Research, 1985-1987
Exxon Research & Engineering 1979-82
Haralson, Kinerk and Morey, Inc. 1985
JHK Associates 1979
Kerley Chemical Company 1979
James McDonald 1992-1993
Motorola Corporation 1994
Nikon Precision Research 1992-1993
Arid Lands Studies - Univ of Ariz, 1979
Pima County Air Quality Control Dist 1981
Perkin-Elmer Company 1986
Sandia National Laboratory 1981-1989
Systems Applications, Inc. 1978
Utah Board of Regents, 2007

**PEER-REVIEWED PUBLICATIONS**

Ramabhadran, T.E., Peterson, T.W. and Seinfeld, J.H., *Dynamics of Aerosol Coagulation and Condensation,* AIChE J., 22(5), 840-851 (1976).

Peterson, T.W., White, J.W. and Krist, E.E., *Off-line Development of a Minicomputer Process Control Program for an Industrial Wet Grinding Circuit*, Trans. SME/AIME, 260, 355-360 (1976).

Peterson, T.W. and Seinfeld, J.H., *Mathematical Model for Transport, Interconversion and Removal of Gaseous and Particulate Air Pollutants-Application to the Urban Plume*, Atmos. Environment, 11, 1171-1184 (1977).

Peterson, T.W., Gelbard, F., and Seinfeld, J.H., *Dynamics of Source-Reinforced, Coagulating and Condensing Aerosols*, J.Coll. Int. Sci., 63(3), 425-455 (1978).

Peterson, T.W. and Seinfeld, J.H., *Calculation of Sulfate and Nitrate Levels in a Growing, Reacting Aerosol*, AIChE J., 25(5), 831-838 (1979).

Peterson, T.W. and Seinfeld, J.H., *Sulfate and Nitrate Levels in Aqueous, Atmospheric Aerosols, Nitrogeneous Air Pollutants*, (D. Grosjean, Ed.) 259-268, Ann Arbor Science Publishers, Ann Arbor, Mich. (1979)

Beyak, R.A. and Peterson, T.W., *Modeling of Aerosol Dynamics: Aerosol Size and Composition*, Annals of N.Y. Acad. Sci., 338, 174-189 (1980).

Peterson, T.W. and Seinfeld, J.H., *Heterogeneous Condensation and Chemical Reaction in Droplets-Application to the Heterogenous Atmospheric Oxidation of $SO_2$*, Adv. in Env. Sci. and Tech., (J.N. Pitts, Ed.) 10, 125-180 (1980).

PUB 1 Moyers, J.L. and Peterson, T.W., *Emissions Limits for Variable Sources by Use of Multipoint Rollback,* Atmos. Environment, 14(12), 1439-1444 (1980).

PUB 2 Saxena, P.S. and Peterson, T.W., *Thermodynamics of Multicomponent Electrolytic Aerosols*, J. Coll. Int. Sci., 79(2), 496-510 (1981).

Linak, W.P. and Peterson, T.W., *Visibility/Pollutant Relationships in Southern Arizona-I. Analysis of the Historical Data Base,* Atmos. Environment, 15(12), 2421-2432 (1981).

Peterson, T.W., Moyers, J.L. and Draelos, M., Time Series and Spectral Analysis Applied to Continuous Smelter SO2 Emissions, Sulfur Dioxide Control in Pyrometallurgy, (T. Chatwin and N. Kikumoto, Eds.) TMS/AIME, (1981).

Peterson, T.W., and Moyers, J.L., *Discussions on Emissions Limits for Variable Sources by Use of Multipoint Rollback,* Atmos. Environment, 16(5), 1273-1275 (1982).

Pettit, D.R. and Peterson, T.W., *Coherent Detection of Scattered Light from Submicrometer Aerosols,* Aerosol Science & Technology, 2(3), 351-268 (1983).

Saxena, P., Seigneur, C., and Peterson, T.W., *Modeling of Multiphase Atmospheric Aerosols*, Atmos. Environment, 17(7), 1315-1329 (1983).

Linak, W.P. and Peterson, T.W., *Visibility/Pollutant Relationships in Southern Arizona-- II. A Winter-Summer Field Study*, Atmos. Environment, 17(9), 1811 (1983).

Linak, W.P. and Peterson, T.W., *The Effect of Coal Type and Residence Time on the Submicron Aerosol Distribution from Pulverized Coal Combustion*, Aerosol Science & Technology, 3(1), 77-96 (1984).

PUB 3 Pettit, D.R. and Peterson, T.W., *Theoretical Response Characteristics of the Coherent Optical Particle Spectrometer*, Aerosol Science & Technology, 3(3), 305-315 (1984).

Peterson, T.W., Scotto, M.V. and Sarofim, A.F., *Comparison of Comminution Data to Analytical Solutions of the Fragmentation Equation*, Powder Technology, 45, 87-93 (1985).

PUB 4 Peterson, T.W., *Similarity Solutions for the Population Balance Equation Describing Particle Fragmentation*, Aerosol Science & Technology, 5(1), 93-101 (1986).

Linak, W.P. and Peterson, T.W., *Mechanisms Governing the Composition and Size Distribution of Ash Aerosol in a Laboratory Pulverized Coal Combustor*, Twenty-first Symp. (Int'l) on Combustion; Combustion Inst., 399-410, (1986).

Scotto, M.V., Bassham, E.A., Wendt, J.O.L. and Peterson T.W., *Quench-Induced Nucleation of Ash Constituents During Combustion of Pulverized Coal in a Laboratory Furnace*, Twenty-Second Symp. (Int'l) on Combustion; Combustion Institute, 239-247, (1988).

Stratmann, F., Fissan H., and Peterson, T.W., *Particle Deposition onto a Flat Surface from a Point Particle Source*, J. Environmental Sciences, 31(6), 39-41 (1988).

Scotto, M., Bassham, E., Wendt J.O.L., and Peterson, T.W., *Inorganic Aerosol Behavior in Beulah Lignites: Influence of Temperature Quench Rate, Mineral Matter and Ash Deposition from Coal* (R.W. Bryers and K.S. Vorres, Eds., United Eng'g. Trustees, Inc., 187-199 (1990).

PUB 5 Gallagher, N., Bool, L., Wendt, J.O.L., and Peterson, T.W., *Alkali Metal Partitioning in Ash from Pulverized Coal Combustion*, Combustion Science and Technology, 74 (1-6), 211-221 (1990).

Scotto M.V., Peterson T.W. and Wendt J.O.L. *Hazardous Waste Incineration: The In-Situ Capture of Lead by Sorbents in a Laboratory Down-Flow Combustor*, Twenty-Fourth Symp. (Int'l) on Combustion; Combustion Institute, 1109-1117, (1992).

Scotto M.V., Uberoi M., Peterson T.W., Shadman F. and Wendt J.O.L. *Metal Capture by Sorbents in Combustion Processes*, Fuel Processing Technology, 39 (1-3), 357-372, (1994).

Bool L.E., Peterson T. W. and Wendt J. O. L. *The Partitioning of Iron During the Combustion of Pulverized Coal*, Combustion and Flame, 100 (1-2), 261-270 (1995).

Ogden K., Peterson T. W. and Sinclair J. L. *Chemical and Environmental Engineering, A Logical Combination*, Chemical Engineering Education, ASEE, 234-239, Fall (1995).

Garrity M.P., Peterson T.W., Garrett L.M. and O'Hanlon J.F. *Fluid Simulations of Particle Contamination in Post-Plasma Processes* J. Vac. Sci. and Technol., A13 C6, 2939-2944 (1995).

Garrity M. P. Peterson T. W. and O'Hanlon J. F. *Particle Formation Rates in Sulfur Hexafluoride Plasma Etching of Silicon*, J. Vac. Sci. and Technol., A14 C2, 550-555 (1996).

Gallagher N. B., Peterson T. W. and Wendt J. O. L. *Sodium Partitioning in a Pulverized Coal Combustion Environment*, Proc. of Twenty-Sixth Symp. (Int'l.) on Combustion, Comb. Inst., 3197-3204 (1996).

Roche T. S. and Peterson T. W. *Reducing DI Water Use*, Solid State Technol., 39 (12) 78-87 December (1996).

Roche T. S., Peterson T. W. and Hansen E. *Water Use Efficiency in Immersion Wafer Rinsing*, Materials Research Society Symposium Proceedings, V. 477, p. 529 (1997).

Schabel M., Peterson T. and Sinclair J. *Characterization of Trapped Particles in rf Plasmas*, J. of Applied Physics, 86(4), p. 1834-1842 (1999).

Wu B., Peterson T. W., Shadman F., Senior C. L., Morency J. R., Huggins F. E. and Huffman G. P. *Interactions Between Vapor-phase Mercury Compounds and Coal Char in Synthetic Flue Gas* Fuel Processing Technology 63(2), p. 93-107 (2000).

PUB 6 Schabel M.J., Peterson T. W. and Muscat A. J. *Macromolecule Formation in Low Density CF4 Plasmas: The Influence of H2*. J. Applied Physics, 93(3), 1389-1402, (2003).

Yan J., Seif D., Raghavan S., Vermeire B., Barnaby H., Peterson T. and Shadman F. *Sensor for Monitoring the Rinsing of Patterned Wafers* IEEE Trans. On Semiconductor Mfg, 14(4), 531, (2004).

Peterson Thomas W., *Engineering's Interlinked Challenges: Innovation and Diversity*, ASEE Prism 22(4), 66-67, (2012).

**RESEARCH PRESENTATIONS AND SEMINARS**

Peterson, T.W., White, J.W. and Krist, E.E., Off-Line Development and Testing of a Minicomputer Process Control Program for an Industrial Grinding Circuit, Preprint No. 74-B-40, AIME Annual Meeting, Dallas, Texas (1974).

Peterson, T.W., Aerosol Dynamics in an Urban Atmosphere, Institute of Atmospheric Physics, Univ. Arizona, Dec. (1977).

Peterson, T.W., Orel, A.E. and Seinfeld, J.H., Nitrate Formation in Atmospheric Aerosols, Amer. Chem. Soc., Nat'l. Mtg., Anaheim, CA. (1978).

Peterson, T.W. and Beyak, R.A., Modeling of Aerosol Dynamics: Aerosol Size and Composition, Conf. on Aerosols: Anthropogenic and Natural, Sources and Transport. N.Y. Acad. Sci., New York, (1979).

Peterson, T.W. and Moyers, J.L., Establishing Limits for Highly Variable Emissions Sources, 89th Nat'l. Mtg. Amer. Inst. Chem. Eng., Portland, OR., Aug. (1980).

Peterson, T.W. and Linak, W.P., Visibility/Pollutant Relationships in Arizona, Toxicology Seminar, Univ. Ariz., Oct. 14, 1980.

Peterson, T.W., Near-Stack Particle Dynamics, Engineering Foundation Conf., Easton, MD. Oct. 12-17, 1980.

Peterson, T.W. and Saxena, P., Water Activity Estimation in Multicomponent Electrolytic Aerosols, ACS/IEC Winter Symposium on Aerosol Systems, Tucson, AZ., Jan 26-28, 1981.

Pettit, D.R. and Peterson, T.W., Coherent Detection of Scattered Light from Submicron Particles, ACS/IEC Winter Symposium on Aerosol Systems, Tucson, AZ, Jan. 26-28, 1981.

Peterson, T.W. and Moyers, J.L., Time Series and Spectral Analysis Applied to Continuous Smelter $SO_2$ Emissions, 110th AIME Mtg., Chicago, Feb. 22-26, 1981.

Peterson, T.W., A Chemical Engineer's Approach to Air Pollution, AIChE Northern Great Plains Ann. Regional Conf., Tucson, AZ., March 11--13, 1981.

Peterson, T.W., Beittel, R. and Wendt, J.O.L., The Effects of Staged Combustion on Small Particle Formation in a Laboratory Coal Fired Furnace, Amer. Inst. Chem. Eng. Nat'l Mtg., Detroit, MI., Aug. 1981.

Pettit, D.R. and Peterson, T.W., Coherent Detection of Phase Shifted Light from Submicron Particles, 3rd Symp. on Adv. in Particle Sampling and Measurement, Daytona Beach, FL., Oct. 1981.

Peterson, T.W., Beittel, R. and Linak, W.P., Primary Particle Analysis in the Convective Section of a Coal Fired Furnace, Amer. Inst. Chem. Eng. Ann. Mtg., New Orleans, LA., Nov. 1981.

Peterson, T.W., Recent Developments in $SO_2$ Emissions Limits for Copper Smelters, Cochise Section SME/AIME, 24 Sept. 1982.

Peterson, T.W., Air Pollution Chemistry, Toxicology Seminar, University of Arizona, Nov. 1, 1982.

Peterson, T.W., and Linak, W.P., The Effect of Coal Type and Residence Time on the Submicron Aerosol Distribution from Pulverized Coal Combustion, presented at Western States Mtg. of Combustion Institute and at 2nd Annual Mtg., Amer. Assoc. for Aerosol Res., Pasadena, CA., April 11-12 1983 and College Park, MD., April 18-22, 1983.

Pettit, D.R. and Peterson, T.W., Recent Developments in Coherent Detection of Scattered Light from Submicrometer Aerosols, 2nd Annual Mtg., Amer. Assoc. for Aerosol Res., College Park, MD., April 18-22, 1983.

Peterson, T.W. and Gelbard, F., Simulation of Aerosol Fragmentation Dynamics, 2nd Annual Mtg., Amer. Assoc. for Aerosol Res., College Park, MD April 18-22, 1983.

Peterson, T.W., Physical and Chemical Characterization of Submicrometer Aerosols, Invited lecture at IBM Chemistry Seminar Series, April 29, 1983.

Peterson, T.W., Modeling Aerosol Dynamics, DOE Workshop on Air Dispersion Modeling for Risk Assessment II, Brookhaven Nat'l Labs, Sept. 28, 1983.

Peterson, T.W., Coherent Detection of Scattered Light from Submicron Particles, Dept. Mechanical Engineering, Univ. of Minnesota, Feb. 14, 1984.

Peterson, T.W., Aerosol Formation from Pulverized Coal Combustion, Dept. Mechanical Engineering, Univ. Minnesota, Feb. 15, 1984.

Peterson, T.W., Aerosol Dynamics in a Coal Combustor, Presented at Univ. Washington, Washington State University, and Tufts University, Seattle 11/5/84, Pullman 11/6/84 and Medford MA 12/1/84.

Peterson, T.W. and Linak, W.P., Aerosol Formation from Pulverized Coal Combustion, Dept. of Energy AR & TD Contractors Meeting, Morgantown, WV, Aug. 13-15, 1985.

Peterson, T.W. and Linak, W.P., Trace Species Enrichment in Size-Segregated Combustion Aerosols from Three Western Coals, Annual meeting of Amer. Assoc. for Aerosol Research, Albuquerque, NM, Nov. 18-22, 1985.

Peterson, T.W., Similarity Solutions for the Population Balance Equation Describing Particle Fragmentation, Ann Mtg. of Amer. Assoc. for Aerosol Res., Alb'que, NM, Nov. 18-22, 1985.

Peterson, T.W. and Linak, W.P., Mechanisms Governing the Composition and Size Distribution of Ash Aerosol in a Laboratory Pulverized Coal Combustor, 21st Symposium (Int'l) of Combustion Institute, Munich, West Germany, Aug. 3-8, 1986.

Peterson, T.W. and Dodge, P., Modeling Cleanroom Aerosol Dynamics, 2nd International Aerosol Conference, West Berlin, Sept 22-26, 1986.

Bassham, E.A., Peterson, T.W. and Wendt, J.O.L., The Effect of Temperature on Particulate Sodium Formation in a Laboratory Down-Fired Pulverized Coal Combustor, Western States Mtg. of Combustion Institute, Tucson, AZ, Oct. 27-28, 1986.

Peterson, T.W., Submicron Aerosol Formation from Pulverized Coal Combustion, Arizona State University, Tempe AZ, 4 December 1986.

Peterson, T.W., Modeling of Cleanroom Aerosol Dynamics, University of Duisburg, Duisburg, W.G., 20 July 1987.

Peterson, T.W., Aerosol Formation from Pulverized Coal Combustion, University of Duisburg, Duisburg, W.G., 18 Aug. 1987.

Bassham, E.A., Peterson, T.W. and Wendt, J.O.L., Effect of Temperature Quench Rate on the Surface Enrichment of Sodium in Ash in a Laboratory Coal Combustor, Ann. Mtg. Amer. Assoc. for Aerosol Research, Seattle, WA, Sept. 14-17, 1987.

Bassham, E.A., Scotto, M.V., Peterson, T.W. and Wendt, J.O.L, Surface Enrichment in Ash from a Laboratory Coal Combustor, Engineering Foundation Conf. on Mineral Matter and Ash Deposition from Coal, 21-26 February 1988, Santa Barbara CA.

Peterson, T.W., Quench-Induced Nucleation of Ash Constituents During Combustion of Pulverized Coal in a Laboratory Furnace, Dept. Chemical Engineering, Georgia Tech Univ., 25 April 1988.

Peterson, T.W., Aerosol Dynamics: From Coal to Cleanrooms, Dept. Chemical Engineering, Oregon State Univ., 2 May 1988.

Stratmann F., Fissan H., and Peterson T.W., Particle Deposition onto a Flat Surface from a Point Particle Source, 35th Ann. Tech. Mtg. of Inst. of Env'tal Sci., May 1988, King of Prussia, PA.

Scotto, M.V., Bassham, E.A., Wendt, J.O.L. and Peterson T.W., Quench-Induced Nucleation of Ash Constituents During Combustion of Pulverized Coal in a Laboratory Furnace, Twenty-Second Symp. (Int'l) on Combustion; Combustion Institute, 14-19 August 1988, Seattle WA.

Peterson, T.W., Stratmann, F. and Fissan H., Particle Deposition on Wafers: A Comparison Between Two Modeling Approaches, European Aerosol Conference, Gesellschaft fur Aerosolforschung, 30 August-2 September 1988, Lund, Sweden.

Peterson, T.W., Stratmann, F. and Fissan, H.F., Particle Deposition on Wafers: A Comparison Between Two Modeling Approaches, Int'l. Symp. on Scientific Bases of Particulate Contamination Control in Microelectronics, 7th Annual Mtg. of American Assoc. for Aerosol Research, 10-13 October 1988, Chapel Hill NC.

Gallagher, N.B., Bool, L.E., Wendt J.O.L., and Peterson T.W., Alkali Metal Partitioning in Ash from Pulverized Coal Combustion, 1st Int'l. Cong. on Toxic Combustion By-Products, 2-4 August 1989, Los Angeles, CA.

Gallagher, N.B., Bool, L.E., Wendt J.O.L., and Peterson T.W., Mineral Matter Transformations During Coal Combustion, Ann. Mtg. of Amer. Flame Res. Comm., 2-3 April 1990, Tucson, AZ.

Peterson T.W., Combustion Generated Aerosols, Invited Presentation to National Science Foundation Workshop on Submicron Particles, November 1990.

Wendt J.O.L., Scotto M.V. and Peterson T.W., Prediction and Control of Heavy Metal Emissions from a Laboratory Combustor, Ann. Mtg. Of AIChE, 11-16 Nov. 1990, Chicago, IL.

Scotto M.V., Peterson T.W. and Wendt J.O.L. Suppression of Pb Aerosol from Combustion Processes by Sorbent Injection. Second International Congress on Toxic Combustion By-Products: Formation and Control, 26-29 March 1991, Salt Lake City, UT.

Helble J.J., Srinivasacher S., Boni A.A., Kang S.G., Graham K.A., Sarofim A.F., Beer J.M., Gallagher N.B., Bool L.E., Peterson T.W., Wendt J.O.L., Shah N., Huggins F.E. and Huffman G.P. Mechanisms of Ash Evolution - A Fundamental Study. Part I: Low Rank Coals and the Role of Calcium. Engineering Foundation Conference on Inorganic Transformations and Ash Deposition during Combustion, 10-15 March 1991, Palm Coast FL.

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Gallagher N.B., Peterson T.W. and Wendt J.O.L., Alkali/Silicate Interactions During Pulverized Coal Combustion, Symposium on Ash Chemistry and Physics, 201st Amer. Chemical Society National Mtg., April 1991, Atlanta GA.

Peterson, T.W. Control of Respirable Aerosol Emissions from Combustion and Incineration Processes. Invited Seminar, Dept. of Chemical and Nuclear Engineering, 2 May 1991, Univ Calif - Santa Barbara, CA.

Peterson, T.W. Inorganic Aerosol Formation from Combustion and Incineration Processes, Invited Seminar, Dept. of Chemical Engineering, 6 May 1991, Univ Calif - Berkeley, CA.

Peterson, T.W. Hazardous Waste Incineration, Short Course for American Association for Aerosol Research, Traverse City MI 1991.

Peterson, T.W. Aerosol Formation During Combustion and Incineration Processes, Invited Seminar, Dept. of Chemical Engineering, 29 October 1991, U New Mexico.

Peterson, T.W. Chemical Engineering and it's Environmental Engineering Research Activities, presented to AZ Mining Association, April 14, 1992, Phoenix AZ.

Scotto M.A., Peterson T.W. and Wendt J.O.L. Hazardous Waste Incineration: The In-Situ Capture of Lead by Sorbents in a Laboratory Down-Flow Combustor, Twenty-Fourth Symp. (Int'l) on Combustion; Combustion Institute, 5-10 July 1992, Sydney, Australia.

Scotto M.A., Peterson T.W. and Wendt J.O.L. Lead Aerosol Evolution During Hazardous Waste Incineration: Effect of Cl and Sorbent on Pb Size Distribution, 11th Ann Mtg of Amer. Assoc. for Aerosol Res., October 12-16, 1992, San Francisco.

Peterson, T. W. Control of Toxic Metal Emissions from Combustion and Incinerations Processes, Conf. on Hazardous and Special Waste Mgt Through the 20th Century; Commission on the Arizona Environment, 10 Dec 1992, Tucson, AZ.

Peterson, T. W. The In-Situ Capture of Lead and Sorbents in a Laboratory Down-Flow combustor, Invited Seminar, Dept. of Chemical and Fuels Engineering, 19 January 1993, U Utah.

Scotto M. V., Uberoi M., Peterson T. W., Shadman F. and Wendt J. O. L. Metal Capture by Sorbents in Incineration Processes, US DOE/EPRI Workshop on Trace Elements Transformations in Coal Fired Power Systems, 19-22 April 1993, Scottsdale, AZ.

Bool L.E., Peterson T. W. and Wendt J. O. L. *The Partitioning of Iron During the Combustion of Pulverized Coal*, 25th Symposium (International) on Combustion, Irvine CA., 1994.

Garrity M.P., Peterson T. W., O'Hanlon J. F. and Carlile R. N. (1994) *Physical and Chemical Characterization of Particles Generated in an $SF_6$ /Ar RF Discharge"*, Fourth International Aerosol Conference, Los Angeles, CA August.

Garrity M.P., Peterson T. W. , Garrett L. and O'Hanlon J. F. (1994) *Fluid Simulations of Particle Contamination in Afterglow of Plasma Processes"*, American Vacuum Society Symposium, Denver, CO October 26, 1994.

Garrity M. P., Peterson T. W., O'Hanlon J. F., and Carlile R. N. (1994) *Physical and Chemical Characterization of Particles Generated in an $SF_6$ /Ar RF Discharge"*, Topical Conf. on the Synthesis and Processing of Electronic Mat'ls, AIChE Annual Meeting, San Francisco, Nov. 15.

Garrity M. P., Peterson T. W. and O'Hanlon J.F. (1995) *Particle Formation Rates in Sulfur Hexafluoride Plasma Etching of Silicon*, Conf on Dusty Plasmas, Wickenburg AZ, Oct. 1-7.

Garrity M. P., Peterson T. W., O'Hanlon J. F. and LaBrosse J. (1995) *Study of Dissociation and Etch Products of Low Pressure $SF_6$/Argon RIE using Differential Pressure Source Quadrupole Residual Gas Analyzer*, Amer Vacuum Soc. Symp, Minneapolis MN, Oct. 16-20.

Garrity M. P. and Peterson T. W. (1995) *Estimation of Particle Formation Rates in $SF_6$/Argon Etching of Silicon*, AIChE Annual Meeting, Miami Beach, FL, Nov 15, 1995.

Garrity M.P., Peterson T. W., Sinclair J., Schabel M. and Lynch D. (1996) *Particle Formation in Plasmas: Gas Phase Chemical Precursors and Chemical Characterization of Particle Trap Dynamics*, Fifth World Congress of Chemical Engineering, San Diego, CA, 14 July, 1996.

Gallagher N. B., Peterson T. W. and Wendt J. O. L. *Sodium Partitioning in a Pulverized Coal Combustion Environment*, Twenty-Sixth Symposium (Int'l.) on Combustion, Naples, Italy July 28, 1996.

Peterson T., Sinclair J., Shadman F., Ogden K. and Sierka R. (1996) *Chemical Engineering and Environmental Design in the Micro-Electronics Industry*, Annual Mtg. of American Inst. of Chemical Engineers, Chicago IL, November 1996.

Schabel M., Lynch D., Sinclair J. and Peterson T. (1996) *Particle Formation in Plasmas: Effect of Plasma Operating Parameters in $SF_6$/Ar Etching of Silicon*, Annual Mtg. of American Inst. of Chemical Engineers, Chicago IL, November 1996.

Peterson T. (1996) *Water and Chemical Use Reduction in Micro-Electronics*, Chemical and Environmental Engineering, University of Arizona, December 1996.

Peterson T. (1997) *Environmental Implications of Semiconductor Manufacturing*, Department of Commerce Environmental Best Manufacturing Practices Conference, Tucson, February 1997.

Peterson T. W. (1997) *Chemical and Environmental Engineering at the University of Arizona*, Invited Seminar, Dept of Chem. and Env'tal Eng'g, Illinois Inst. of Tech., Chicago IL, Mar 1997.

Peterson T. W. and Roche T. S. (1997) *Flow Modifications for DI Rinse Water Reduction*, 19th Conf. Of Semiconductor Safety Assoc., Orlando FL, Apr. 1997.

Roche T. S., Peterson T. W. and Hansen E. (1997) *Water Use Efficiency in Immersion Wafer Rinsing*, Spr. Mtg. of Materials Research Society, San Francisco CA, Apr. 1997.

Peterson T.W., Shadman F. and Ogden K. (1997) *Chemical and Environmental Design in the Microelectronics Industry*, Ann. Mtg. of Amer. Soc. For Engineering Educ., Milwaukee WI, June 1997.

Schabel M., Peterson T., Sinclair J. and Lynch D. (1997) *Particle-Particle Interactions in a Dusty Argon Plasma*, Ann Mtg. of Amer. Assoc. for Aerosol Res., Denver CO,Oct.1997.

Schabel M., Sinclair J., Peterson T. and Lynch D. (1997) *Laser Doppler Measurements of Particle Contaminants in Plasma Reactors*, Annual Mtg. of American Inst. of Chemical Engineers, Los Angeles CA, November 1997.

Schabel M., Peterson T., Sinclair J. and Lynch D. (1997) *Characterization of Particle Behavior in a Dusty Argon RF Plasma*, Amer. Vacuum Soc. Nat'l. Symp., Oct. 1997.

## PRESENTATIONS ON BEHALF OF THE NATIONAL SCIENCE FOUNDATION

### A. INVITATIONS FROM UNIVERSITIES

*Complexity in Natural, Social and Engineered Systems*, Invited Luncheon Presentation to International Symposium on Engineered Systems MIT, Cambridge MA, June 15, 2009.

*Our World is Engineered*, North Carolina State University, College of Engineering, November 19, 2009.

*Our World is Engineered*, Atlantic Coast Conference of Engineering Deans, Arlington VA, January 11, 2010.

*Research and Education Opportunities at NSF*, Invited Seminar, Penn State University, February 25, 2010.

*The Educational Imperatives of the Grand Challenges*, Boston Grand Challenge Summit, Olin College, Wellesley MA, April 21, 2010.

Moderated Discussion on the Role of Universities in Innovation, Economic Development, Job Creation, and R&D Commercialization, Department of Commerce University Innovation Forum, Univ of Southern California, Los Angeles CA, July 8, 2010.

Moderated Discussion on University Strategies to Support Commercialization, Department of Commerce University Innovation Forum, Georgia Tech, Atlanta GA, July 15, 2010.

*Stimulating Innovation within the Academic Community*, Botsaris Lecture (Invited), Tufts University, Medford MA, April 27, 2011.

*National Science Foundation Overview: Where Discoveries Begin*, University of Arizona, Tucson AZ, September 12, 2011.

*Stimulating Innovation in Academia: The Role of Public-Private Partnerships*, Florida Innovation summit, University of Florida, Gainesville FL, September 16, 2011.

Invited Panelist, Hispanic Engineering, Science and Technology (HESTEC) Congressional Roundtable on Science Literacy, University of Texas Pan American, September 26, 2011.

*If it's Jobs we Need, Why Invest in Basic Research?* UU Distinguished Lecture, Dept of Chemical Engineering, University of Utah, Salt Lake City UT, January 31, 2012.

*NSF Issues and Perspectives*, Invited presentation to Board of Overseers, Tufts University, Medford MA, Oct 14, 2010.

*National Science Foundation Funding Priorities for FY2013 and Forward*, Texas Vice Presidents for Research, Austin TX, March 30, 2012.

*Investments in Engineering Research at NSF*, Invited presentation to University of California, Irvine CA, May 9, 2012.

*Investments in Engineering Research at NSF*, Invited presentation to California Institute of Technology, Pasadena CA, May 10, 2012.

*Stimulating Innovation Within Engineering Colleges*, Invited Seminar, Arizona State University, Tempe AZ, August 27, 2012.

*A New Era of Global Science and Engineering*, University of Texas, Arlington, November 1, 2012.

## B. INVITATIONS FROM PROFESSIONAL SOCIETIES

*Engineering at NSF*, ASEE Engineering Deans' Council Public Policy Colloquium, Washington DC, February 17, 2009.

*NSF Perspective on Translational Research*, American Institute of Medical and Biological Engineering Public Policy Meeting, Washington DC, February 13, 2009.

*NSF Investments in the NAE Grand Challenges*, Engineering Deans Panel, National Academy of Engineering Grand Challenges Summit, Durham NC, March 1, 2009.

*Environmental Engineering Investments at the NSF*, University-Federal Dialogue on Environmental and Energy Research and Education, Council of Environmental Deans and Directors (CEDD) and the Council of Energy Research and Education Leaders (CEREL) of the National Council for Science and the Environment (NCSE), Washington DC, April 20, 2009.

*Facilitating Solar Innovation: Federal Agency Roles*, Partnering for Photovoltaic Manufacturing in the United States, National Academies Solar manufacturing Conference, Washington DC, July 29, 2009.

*Building Resilient and Sustainable Infrastructure*, American Society of Civil Engineering Industrial Leadership Council, Washington DC, October 13, 2009.

*Funding Opportunities at the National Science Foundation*, Association for Women In Science, Alexandria VA, October 29, 2009.

*NSF Investments in Aerosol Research*, Annual Meeting, American Association for Aerosol Research, Minneapolis MN, October 30, 2009.

*NSF Funding for the Engineering Community*, American Society of Mechanical Engineers, National Meeting, Orlando FL, November 16, 2009.

*Our World is Engineered*, American Association for Engineering Societies Board of Directors, December 1, 2009.

*Diversity in Engineering*, The Problem Solvers: Education and Career Paths of Engineers with Disabilities, American Association for the Advancement of Science (AAAS) Headquarters, Washington, DC December 14, 2009.

*Building an Innovation Ecosystem*, ASEE Engineering Deans Council Public Policy Colloquium, Washington DC, February 9, 2010.

*Engineering Directorate Budget Presentation FY2011*, ASEE Engineering Research Council, Washington DC, March 16, 2010.

*NSF: Investing in America's Future*, 14th SSTI Annual Conference, Accelerating Innovation: The Road Ahead for Tech-based Economic Development, Pittsburgh PA, Sept 15, 2010.

*NSF: Investing in America's Future*, AAU Council on Federal Relations Meeting, Washington DC, Sept 16, 2010.

*Engineering Directorate Budget Presentation FY2011* AIChE Annual Meeting, Salt Lake City, UT, November 8, 2010.

*Science Engineering and Education for Sustainability (SEES)*, 2nd International Congress on Sustainability Science & Engineering (ICOSSE), Tucson AZ, January 11, 2011.

*NSF: Investing in America's Future*, APLU Council on Governmental Relations Meeting, Washington DC, March 2, 2011.

*NSF Directorate For Engineering FY12 Budget Presentation*, ASEE-ERC Meeting, Washington DC, Mar 8, 2011.

*Engineering Graduates: Shortage or Glut?* Engineering Deans' Institute, Palm Springs CA, April 11, 2011.

*Engineering Directorate Investments in Simulation-based engineering*, Society for Industrial and Applied Mathematics (SIAM) Committee on Science Policy, Washington DC, April 14 2011.

*NSF Investment in STEM Education for Societal Impact*, ASME Public Policy Forum, Washington DC, May 17, 2011.

*Science, Engineering and Education for Sustainability*, 6th University-Federal Dialogue on Energy Research and Education, Council of Energy Research and Education Leaders (CEREL) of the National Council for Science and the Environment (NCSE), Washington DC, May 23, 2011.

*Advancing the Innovation Ecosystem within the Academic Community*, American Institute of Medical and Biological Engineers (AIMBE) Conference, Stanford University, Palo Alto CA, June 13, 2011.

*Advancing the Innovation Ecosystem within the Academic Community*, APLU Joint CICEP-CEO Conference, Portland OR, June 20, 2011.

*Stimulating Innovation within the Academic Community*, ASME InterPACK 2011 Conference, Portland OR July 6, 2011.

*Stimulating Innovation within the Academic Community*, 2nd American Ceramic Society Leadership Summit, Baltimore MD, August 3, 2011.

Invited Panelist, The Future of the Research University, 63rd Annual Meeting AAU Assoc for Graduate School Deans Washington, DC, September 18, 2011.

*Solar Energy Research Opportunities at NSF*, Scialog Solar Energy Conversion Conference, Research Corporation for Science Achievement, Biosphere II, Oracle AZ, October 13, 2011.

*The Importance of Basic Research Investment to Economic Growth*, International Year of Chemistry Plenary Lecture, AIChE Annual Meeting, Minneapolis MN, October 17, 2011.

*NSF: Ground Zero for the US Science Research Enterprise*, APLU Annual Meeting, San Francisco CA, November 13, 2011.

*Sustainability and Innovation Investments at the National Science Foundation*, NCSE Conference: Environment and Security, Washington DC, January 18, 2012.

*Engineering and a Changing Economic Landscape*, ASEE Public Policy Colloquium, Washington DC, February 7, 2012

*Engineering Investments at the National Science Foundation*, ASEE Engineering Research Council Annual Meeting, Washington DC, March 6, 2012.

*Engineering Investments at the National Science Foundation*, US National Committee on Theoretical and Applied Mechanics, National Academies, Washington DC, May 4, 2012.

*Best Practices in Public Private Partnerships for Translational Research*, Building the Illinois Innovation Economy, National Academy of Sciences' Board on Science,

Technology, and Economic Policy (STEP), Northwestern University, Chicago IL, June 28, 2012.

*A New Era of Global Science and Engineering*, Council on Governmental Relations, Washington DC, October 25, 2012.

## C. FORMAL CONGRESSIONAL TESTIMONY

*Engineering in K-12 Education*, Testimony before the US House of Representatives Committee on Science and Technology, Subcommittee on Research and Science Education, Washington DC, October 22, 2009.

*From the Lab Bench to the Marketplace: Improving Technology Transfer*, Testimony before the US House of Representatives Committee on Science and Technology, Subcommittee on Research and Science Education, Washington DC, June 10, 2010.

*The Innovation Corps Program: One tool in the NSF Innovation Ecosystem Arsenal*, Testimony Before the U.S. House of Representatives Committee on Science, Space, and Technology, Subcommittee on Research and Science Education, Field Hearing, Northwestern University, Chicago IL, July 16, 2012.

*Keeping America Secure: The Science Supporting the Development of Threat Detection Technologies*, Testimony on Physical Threats Before the U.S. House of Representatives Committee on Science, Space, and Technology, Washington DC, July 19, 2012.

## D. PRESENTATIONS TO THE LEGISLATIVE BRANCH

*Emerging Opportunities for Engineering*, Presentation to House Committee on Appropriations Staff, Washington DC, July 22, 2009.

*NSF: Investing in America's Future*, Coalition for National Science Funding (CNSF) R&D Caucus Luncheon, Rayburn House Office Bldg, Washington DC, June 24, 2010.

*NSF Directorate for Engineering Overview*, Briefing to Staff, Committee on Science and Technology, House of Representatives, April 8, 2011.

*Advanced Manufacturing*, Presentation to US Conference on Mayors Summer Leadership Meeting, Representative Chakah Fattah Host, Philadelphia PA, July 20, 2012.

## E. PRESENTATIONS TO THE EXECUTIVE BRANCH

*FY2010 Budget Briefing*, Office of Management and Budget, Washington DC, February 25, 2009.

*Creating an Innovation Ecosystem*, Presentation to Tom Kalil, Deputy Director,White House Office of Science and Technology Policy, Washington DC, August 20, 2009.

*Creating an Innovation Ecosystem*, Presentation to Aneesh Chopra, President's Chief Technology Officer, White House Office of Science and Technology Policy, Washington DC, September 17, 2009.

*Budget Briefing, FY2011 Request*, Office of Management and Budget, Washington DC, October 7, 2009.

*NSF Contributions to the Innovation Ecosystem*, White House Office of Science and Technology Policy, Washington DC, September 7, 2010.

## F. REPRESENTING U.S.A. AT STATE DEPARTMENT SPONSORED INTERNATIONAL MEETINGS

*Complexity in Natural, Social and Engineered Systems*, Franco-American Committee on Science and Technology, Paris France, June 11, 2009.

*Nanoscale Science and Engineering at the National Science Foundation*, Franco-American Committee on Science and Technology, Paris France, June 11, 2009.

*Energy Research and Education at the National Science Foundation*, Franco-American Committee on Science and Technology, Paris France, June 11, 2009.

*Renewable Energy Investments in the National Science Foundation*, New Zealand Joint Coordinating Meeting, Wellington, NZ, January 25, 2010.

*Investing in America's Future*, United States – India Joint Commission On Science and Technology Cooperation, Washington DC, June 24, 2010.

*Overview of the US-Ireland Research Partnership*, US-Ireland Telecommunications Workshop, Science Foundation Ireland, Dublin Ireland, November 1, 2011.

Member of Official Science Delegation, US-Brazil Joint Commission Meeting, led by John Holdren, Brasilia Brazil, March 12, 2012.

## G. REPRESENTING NSF AT OTHER INTERNATIONAL MEETINGS

*Nanoscale Science and Engineering at the NSF*, National Science Foundation - Deutsche Forschungsgemeinschaft (NSF/DFG) Conference on Nanoscience and Engineering, New York NY, October 16, 2009.

*Nanoscale Science and Engineering at the NSF*, National Science Foundation/Russian Foundation for Basic Research and Russian Academy of Sciences (NSF/RFBR/RAS) Joint meeting, Moscow and St. Petersburg, Nov 9-12, 2009.

*Building an Innovation Ecosystem*, German CEO Delegation, Washington DC, May 3, 2010.

Invited Panelist, Preliminary Proposal Review for German Excellence Initiative, RWTH Aachen Germany, November 2, 2011.

*Innovations in Learning and Education*, US-Finland Education Workshop, Embassy of Finland, Washington DC, June 8, 2012.

*Overview of NSF Engineering*, Presentation to RWTH Aachen Delegation, Ernst Schmachtenberg, Rector, Washington DC, September 12, 2012.

*Human Resource Training and Education in STEM Fields*, Organization of American States Inter-American Committee on Sci and Tech (COMCyT), Washington DC, October 18, 2012.

External Reviewer, Frontier Engineering Program, Engineering and Physical Sciences Research Council, Swindon UK, October 22, 2012.

## H. PRESENTATIONS TO NATIONAL SCIENCE BOARD AND INTERNAL NSF MEETINGS

*Emerging Opportunities for Engineering*, National Science Board, National Science Foundation, Arlington VA, February 24, 2009.

*Directorate for Engineering Use of Recovery Act Funds*, National Science Board, Arlington VA, May 11, 2009.

*Creating an Innovation Ecosystem*, National Science Board, Arlington VA, August 6, 2009.

*Directorate for Engineering Overview*, Webcast for Emerging Frontiers for Science and Innovation, National Science Foundation, Arlington VA, August 20, 2009.

*Enhancing Engineering through Broadening Experiences*, Committee on Equal Opportunities in Science and Engineering, National Science Foundation, Arlington VA, October 26, 2009.

*Directorate for Engineering FY2011 Budget Request*, National Science Foundation, Arlington VA, February 1, 2010.

*NSF Energy Research and Education*, Advisory Committee on Environmental Research and Education, Arlington DC, Sept 8 2010.

*Directorate for Engineering FY2012 Budget Request*, National Science Foundation, Arlington VA, February 14, 2011.

*NSF Directorate For Engineering FY12 Budget Presentation*, Michigan Tech University Faculty Visit, Arlington VA, April 7, 2011.

## I. PRESENTATIONS TO NSF GRANTEES CONFERENCES

*Engineering Investments at the National Science Foundation*, NSF Engineering Education and Centers Grantees Conference, Reston, VA, February 2, 2009.

*An NSF Perspective on Translational Research*, SBIR-STTR Grantees Conference, Baltimore MD, May 20, 2009.

*The Role of SBIR in the NSF Innovation Ecosystem*, Small Business Innovation Research Grantees Conference, Alexandria, VA, September 22, 2009.

*Creating an Innovation Ecosystem*, EPSCoR Grantees Conference, Alexandria VA, October 19, 2009.

*The Role of Engineering Research Centers in Building an Innovation Ecosystem*, Engineering Research Center Directors meeting, December 2, 2009.

*Translational Research at NSF*, Nanoscale Science and Engineering Grantees Conference, Arlington VA, December 8, 2009.

*The Role of Industry University Cooperative Research Centers in Building an Innovation Ecosystem*, IUCRC Directors meeting, Arlington VA, January 14, 2010.

*Innovation and Translational Research*, Engineering Education and Centers Grantees Conference, Reston VA, February 1, 2010.

*New Directions for the NSF Partnerships for Innovation Program*, PFI Grantees Workshop, Arlington VA, April 26, 2010.

*Stimulating Innovation within the Academic Community*, EPSCoR Grantees Conference, Alexandria VA, May 16, 2011.

*Challenges of Diversity in Engineering Education*, Quality Education for Minorities (QEM) Workshop, Baltimore MD, November 18, 2011.

*ERCs and the Nation's Innovation Ecosystem*, Engineering Research Center Annual Grantees Conference, Washington DC, December 1, 2011.

*Nanoscale Science and Engineering at the NSF*, Nanoscale Science and Engineering Grantees Conference, Arlington VA, December 5, 2011.

*NSF Investments in an Innovation Ecosystem*, Industry University Cooperative Research Centers Grantees Conference, Arlington VA, January 12, 2012.

*Farewell Remarks on the NSF Engineering Research Center Program*, ERC Annual Meeting, Washington DC, November 16, 2012.

## J. OTHER PRESENTATIONS ON BEHALF OF NSF

Panelist, National Academy of Engineering workshop on the Lifelong Learning Imperative Arlington VA, June 18, 2009.

*Supporting Regional Innovation*, Regional Innovation Clusters Meeting, Dept of Commerce, Washington DC, September 24, 2009.

*The Administration's Innovation Policy: What Is It and What Should it Be?*, Panel for 2nd Annual Federal Trade Commission Conference on Microeconomics, Washington DC, November 20, 2009.

Invited Panelist, Catalyzing University Research for a Stronger Economy, National Academies, Washington DC, February 24, 2010.

*Cyber-Physical Systems and Engineering*, Cyber-Physical Systems Workshop, Institute for Defense Analysis, Alexandria VA, March 11, 2010.

*The NSF and Innovation: SBIR and Partnership Programs*, Early Stage Capital in the United States: Moving Research Across the Valley of Death and the Role of SBIR, National Academies, Washington DC, April 16, 2010.

Invited Panelist, Government Panel on Federal Investment in Chemical Research, Council for Chemical Research, Atlanta GA, April 19, 2010.

*Funding Opportunities in Engineering at NSF*, Regional Grants Conference, Salt Lake City UT, Oct 26, 2010.

Invited Panelist, CTO Roundtable on Graduate Education, Council for Chemical Research, Crystal City VA, December 13, 2010.

*Stimulating Innovation in Academia*, Coalition for National Science Funding, Capitol Hill, Washington DC, November 15, 2011.

Member of NSF Delegation to President Barack Obama presentation on Manufacturing, Rolls-Royce Crosspointe, Petersburg VA, March 9, 2012.

National Science Foundation Cyberlearning Portfolio, Cyberlearning Funders' Summit, Chicago IL, March 25, 2012.

*Stimulating Innovation in U.S. Research Universities*, Invited Dinner Speech, Chemical Heritage Foundation Innovation Day, Philadelphia PA, September 12, 2012.

**PROCEEDINGS, PATENTS AND NON-PROPRIETARY REPORTS**

Peterson, T.W., Eckhardt, J.G. and Moyers, J.L., Assessment of Air Quality at Tucson International Airport, Office of Arid Lands Studies, Univ. of Arizona, Tucson, AZ, Mar. 1979.

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Peterson, T.W., Technology Assessment: Particulate Impact and Control, Exxon Research and Engineering, Florham Park, N.Y., 15 Feb. 1982.

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Peterson, T.W. and Linak, W.P., Aerosol Dynamics in the Convection Section of a Laboratory Scale Coal Combustor, Proc. 1st Int'l. Aerosol Conf., B.Y.H. Liu, D.Y.H. Pui, H.J. Fissan, Eds.; Elsevier, 1985.

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Dodge, P.X. and Peterson, T.W., Single Particle Trajectory Calculations, Final Report to Microcontamination Control Center, December 1987, University of Arizona.

Peterson, T.W., Stratmann, F. and Fissan, H.F., Particle Deposition on Wafers: A Comparison Between Two Modeling Approaches, Report to Microcontamination Control Center, December, 1987, University of Arizona.

Peterson, T.W., Stratmann, F. and Fissan, H.F., Particle Deposition onto a Flat Surface from a Point Source, Proc. Ann. Mtg. of Institute for Environmental Sciences, 2-6 May 1988, King of Prussia, PA.

Gallagher N.B., Peterson T.W. and Wendt J.O.L., Alkali/Silicate Interactions During Pulverized Coal Combustion, Symposium on Ash Chemistry and Physics, 201st Amer. Chemical Society National Mtg., 36(1), 181-190, 1991.

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Schabel M., Sinclair J., Peterson T. and Lynch D. (1996) *Particle Formation in Plasmas: Effect of Plasma Operating Parameters on Particle Nucleation, Growth and Dynamics* Proc. $5^{th}$ World Congress of Chemical Engineering, AIChE, p. 775-778.

Peterson T. W. and Roche T.S. (1997) *Flow Modifications for DI Rinse Water Reduction*, Proceedings of Semiconductor Safety Association Annual Meeting, Orlando FL.

**GRANTS AWARDED FOR SCIENTIFIC RESEARCH**

Principal Investigator
Aerosol Growth in Arid Regions
National Science Foundation 3/78-3/80 $24,900

Principal Investigator
Sampling and Analysis of Hot Particulate Pollutants
Department of Energy 9/78-9/80 $44,675

Co-Principal Investigator (with J.L. Moyers)
Multipoint Rollback Calculations for Establishing Sulfur Dioxide Emissions Limits for Arizona Copper Smelters
EPA Region IX, via Ariz. Dept. of Health Serv.9/79-6/80 $20,000

Senior Investigator (J.O.L.Wendt, P.I.)
Advanced Staged Combustion Configurations for Pulverized Coal
Dept. of Energy, 9/79-8/82 $60,000

Co-Principal Investigator (with J.L. Moyers)
Development of $SO_2$ Emission Limits for the Kennecott Smelter in New Mexico
Kennecott Copper Corp. 5/80-10/80 $12,000

Principal Investigator
Development and Application of the Coherent Optical Particle Spectrometer
Development Fund, Vice President for Research, University of Arizona 3/81-12/81 $25,000

Co-Principal Investigator (with J.L. Moyers)
Review and Critique of Individual Applications of Multipoint Rollback Calculations of Emissions Limits
EPA 6/81-12/81 $13,500

Principal Investigator
Equipment Grant, Coherent Optical Particle Spectrometer
Development Fund, Vice President for Research University of Arizona 7/81 $14,750

Principal Investigator
Development of the Coherent Optical Particle Spectrometer
R.J. Reynolds Tobacco Co. 3/82-3/83 $9,533

Principal Investigator
Coherent Detection of Scattered Light from Submicron Particles
National Science Foundation 3/83-9/84 $41,200

Principal Investigator
Modeling of Comminution Processes
Mining and Mineral Resources Research Institute 7/83-7/84 $11,000

Principal Investigator
Aerosol Formation from Pulverized Coal Combustion
Department of Energy 9/83-3/86 $106,225

Co-Principal Investigator (with J.O.L. Wendt)
Fixation of Alkali and Trace Metals in High Temperature Co-Current, Entrained Flow Gasifiers and Combustors
Department of Energy 9/1/84-8/31/86 $149,994

Co-Principal Investigator (with J.O.L. Wendt and F. Shadman)
Scanning Auger Microprobe for Particle Analysis
Department of Energy 9/1/84-8/31/85 $279,000

Principal Investigator
Modeling of Clean-room Aerosol Dynamics
Microcontamination Control Center 1/1/85-1/1/87 $62,676

Co-Principal Investigator (with J.O.L. Wendt and F. Shadman)
The Effect of Minerals Stratification on Aluminum Recovery from Coal Ash Particles
Mining and Mineral Resources Research Institute 7/1/86-6/30/87 $16,030

Co-Principal Investigator (with F. Shadman and J.O.L. Wendt)
Mechanisms of Surface Enrichment and Adhesion of Coal Combustion Particulates
Department of Energy 9/15/86-9/15/89 $174,970

Principal Investigator
Modeling of Clean-room Aerosol Dynamics
Microcontamination Control Center 1/1/87-1/1/88 $30,000

Principal Investigator (with J.O.L. Wendt)
Transformation of Mineral Matter in Coal
Department of Energy; subcontract through Physical Sciences, Inc. 10/1/86-9/31/89 $300,995

Principal Investigator
Modeling of Clean-room Aerosol Dynamics
Microcontamination Control Center 1/1/88-1/1/89 $39,201

Co-Principal Investigator (with J.O.L. Wendt)
Prediction and Control of Heavy Metal Emissions from Combustion Processes
US Environmental Protection Agency 4/1/88-9/30/90 $70,000

Principal Investigator
Modeling of Clean-room Aerosol Dynamics
Microcontamination Control Center 1/1/89-6/30/89 $9,687

Principal Investigator (with J.O.L. Wendt)
Transformation of Mineral Matter in Coal
Department of Energy; renewal through Physical Sciences, Inc. 10/1/89-9/31/91 $110,000

Principal Investigator (with J.O.L. Wendt and F. Shadman)
Synergistic Capture Mechanisms for Alkali and Sulfur Species from Combustion
Department of Energy 9/1/90 - 8/31/93 $199,977

Principal Investigator (with Scott Beck)
Development of an Extraction System for the Characterization of Plasma Generated Particles
Center for Microcontamination Control 7/1/92 - 6/30/93 $43,714

Principal Investigator
Service Agreement: Undergraduate Student Internship in Environmental Engineering
International Business Machines 7/1/92 - 6/30/93 $19,957

Principal Investigator
Fundamental Study of Ash Formation and Deposition: Effect of Reducing Stoichiometry;
Dept of Energy, through Physical Sciences, Inc. 5/1/93 - 4/30/95 $108,043

Principal Investigator
Training Grant/Summer Intern Program: EPA Office of Solid Waste and Emergency Response
Environmental Protection Agency - OSWER 5/15/93 - 5/15/94 $80,580

Principal Investigator
Development of an Extraction System for the Characterization of Plasma Generated Particles
Center for Microcontamination Control 7/1/93 - 6/30/94 $43,500

Co-Principal Investigator (Jim Baygents, PI)
Improvements in the Instructional Computing Facilities within Chemical Engineering
Provost's Fund for Undergraduate Computing Facilities 5/15/94 $11,500

Principal Investigator
Training Grant/Summer Intern Program: EPA Office of Solid Waste and Emergency Response
Environmental Protection Agency - OSWER 5/15/94 - 5/15/95 $80,580

Principal Investigator
Particle Formation in Plasma Processing: $SF_6$/Ar Etching and $CHF_3$,$CF_4$/Ar Dielectric etching, Center for Microcontamination Control 7/1/94 - 6/30/95 $41,954

Principal Investigator
Training Grant/Summer Intern Program: EPA Office of Solid Waste and Emergency Response
Environmental Protection Agency - OSWER 5/15/95 - 5/15/96 $80,580

Principal Investigator (with Jennifer Sinclair and David Lynch)
Particle Formation in Plasmas: Gas Phase Chemical Precursors and Characterization of Particle Trap Dynamics; Center for Microcontamination Control 7/1/95 - 6/30/96 $56,896

Principal Investigator (with Farhang Shadman)
Toxic Substances from Coal Combustion
Department of Energy - Physical Sciences, Inc. 9/1/95 - 8/31/97 $69,464

Co-Principal Investigator (Jennifer Sinclair, PI)
Acquisition of a Three-Component Fiber Optic Phase Doppler Particle Analyzer/Laser Doppler Velocimeter
National Science Foundation 10/1/95 - 9/30/98 $127,150

Co-Principal Investigator (with Kimberly Ogden and Jennifer Sinclair)
An Integrated Laboratory Introduction to Inter-Media Environmental Problems
National Science Foundation 3/1/96 - 2/28/98 $50,952.65

Principal Investigator (with Jennifer Sinclair and David Lynch)
Particle Formation in Plasmas: Effect of Operating Parameters on Particle Nucleation, Growth and Dynamics
Center for Microcontamination Control 7/1/96 - 6/30/97 $56,896

Co-Principal Investigator (with Jennifer Sinclair)
Education Thrust - Environmentally Benign Semiconductor Manufacturing
Engineering Research Center, NSF/SRC 4/15/96 - 4/14/97 $82,000

Principal Investigator
Reduction of Organic Chemicals Usage in the Photolithography Process
Engineering Research Center, NSF/SRC 4/15/96 - 4/14/97 $64,032

Principal Investigator (with David Lynch and John O'Hanlon)
Plasma Etching: Particulate and Polymer Film Contaminant Characterization
Center for Microcontamination Control 7/1/97 - 6/30/98 $60,653

Co-Principal Investigator (with Kimberly Ogden)
Education Thrust - Environmentally Benign Semiconductor Manufacturing
Engineering Research Center, NSF/SRC 4/15/97 - 4/14/98 $82,000

Principal Investigator
Fundamentals of Chemical Carry Over in Rinse Processes
Engineering Research Center, NSF/SRC 4/15/97 - 4/14/98 $64,148

**REFERENCES**

References available upon request