

# Jefferson Science Fellows 2004–2017

## ✦ 2017 – 2018 Fellows ✦

### **NANCY D. CONNELL**

Department of Medicine, Rutgers New Jersey Medical School



*Bio* - Nancy D. Connell is Professor and Director of Research in the Division of Infectious Disease in the Department of Medicine at Rutgers New Jersey Medical School and Rutgers Biomedical and Health Sciences. A Harvard University PhD in Microbiology, Dr. Connell's major research focus is antibacterial drug discovery in respiratory pathogens such as M. tuberculosis and B. anthracis; recent work also focuses on the use of predatory bacteria as novel therapeutics for treatment of Gram negative bacterial infections. Dr. Connell has been continuously funded by the NIH, the Department of Defense, industry, and other agencies since 1993. Dr. Connell chairs the Institutional Biosafety Committee of Rutgers University and directs the institution's biosafety level three containment laboratory. She serves on or has chaired multiple NIH review panels. Dr. Connell has a long-standing interest in the development of regulatory policies associated with biocontainment work and so-called Dual Use Research of Concern. To this end, she has served on a number of committees of the National Academy of Sciences, e.g., the Advances in Technology and the Prevention of their Application to Next Generation Biowarfare Agents (2004), Trends in Science and Technology Relevant to the Biological Weapons Convention (2010), and Review [of] the Scientific Approaches used in the FBI's Investigation of the 2001 Bacillus anthracis Mailings (2011). In addition to biomedical research policy, Dr. Connell has considerable experience and interest in pedagogy, with a focus on ethics education and the responsible conduct of research: she chaired the NRC "Standing Committee for Faculty Development for Education about Research with Dual Use Issues in the Context of Responsible Science and Research Integrity", which directed a series of workshops throughout the Middle East and North Africa over the past 5 five years. These workshops sought to apply contemporary teaching and learning methodologies ("active learning") to the challenge of increasing awareness among young scientists of the societal implications of their research. She has presented at workshops and meetings around the world on the interrelated issues of biocontainment, infectious disease research, research ethics and dual use research of concern. Dr. Connell was recently appointed a member of the Board on Life Sciences and is a National Associate of the National Academies of Sciences.

### **BERNARD GONIK**

Department of Obstetrics and Gynecology, Wayne State University School of Medicine



*Bio* - Bernard Gonik is a tenured professor and the Fann Sreere Endowed Chair of Perinatal Medicine in the Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology at the Wayne State University School of Medicine in Detroit, Michigan. He completed his undergraduate studies with honors in Zoology at the University of Michigan. His medical school training was at Michigan State University. He completed residency training in Obstetrics and Gynecology at the University of Texas Health Science Center. He undertook advanced fellowship training in Maternal-Fetal Medicine, with an emphasis on infectious diseases, at this same institution. Dr. Gonik began his professional career at the University of Texas Medical School in Houston, and in 1994 moved to the Wayne State University School of Medicine. He has dedicated his career to academic medicine, basic and clinical research, medical education, and most importantly, advocating for women's and children's health. He has prior NIH, private sector and industry funding in basic science and clinical research pertaining to his specialty. He has served as an expert advisor on adult and maternal vaccination to the American College of Obstetricians and Gynecologists, Centers for Disease Control and Prevention, National Vaccine Advisory Committee, and internationally with the Brighton GAIA Collaborative related to vaccine safety and clinical vaccine trials. Earlier in his career, he was awarded a Berlex International Research Fellowship and

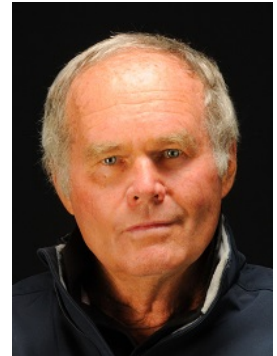
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spent a sabbatical year abroad as the Lady Davis Visiting Professor in the Departments of Biochemistry and Immunology at the Hebrew University studying placental trophoblast immunologic function. He was also a visiting professor on the clinical obstetric service at Chubu Hospital in Okinawa, Japan. In the recent past, he helped fund and co-chaired an international NIH sponsored conference with the School of Engineering at Wayne State University on a biomedical engineering interest of his, the forces of labor and obstetric antecedents to neonatal brachial plexus palsy. Later this year, along with three other international editors, Cambridge University Press will be publishing the 5th edition of his textbook *High Risk Pregnancy: Management Options*.

### **ERNEST RICHARD (DICK) GREENE**

Department of Engineering, Department of Biology, New Mexico Highlands University

Bio - Ernest Richard (Dick) Greene has been a Professor of Engineering and Biology at New Mexico Highlands University and a Research Professor of Engineering and Medicine at the University of New Mexico since 1992. He received his BS and MME degrees in Mechanical Engineering at Rice University and a PhD in Mechanical/Bioengineering at Colorado State University. He was raised on a family cattle ranch in rural New Mexico. After working in the oil fields during his college years and after graduation, he became an offshore Project Engineer for Brown and Root Inc. He served as a US Army First Lieutenant and Platoon Leader for 2 years in the Combat/Construction 34th Engineers during the Vietnam conflict. Subsequently, Dick was a Senior Scientist and Director of the Cardiovascular Laboratory for 12 years at the Lovelace Institutes. There, he was awarded an NIH Fogarty International Fellow. As an active biomedical engineer focusing on noninvasive anatomical and physiological measurements in human health and disease, he has been a Visiting Professor at major research universities throughout the world including Brazil, Chile, USSR/Russia, New Zealand, Denmark, China, India, Nepal, Bolivia, Canada, and most recently, Namibia. He has served on, or for, various major journal editorial boards and review panels within multiple disciplines. His numerous awards include Medical Volunteer of the Year by the American Heart Association and National Young Investigator of the Year by the American Academy of Orthopedic Surgery. His research has been funded by over 50 competitive grants from various agencies including the NIH (RO1), AHA (Grants in Aid), NASA, and VA (Merit Reviews). Two edited books, 12 chapters in books, and over 100 peer reviewed publications have been published with over 200 abstracts presented at international meetings. Dick has taught over 140 university courses, mentored 58 senior projects, senior advised 33 MS, 17 PhD, and 7 MD research theses in subjects ranging from thermodynamics and bioengineering to basic biology and human anatomy and physiology. Other interests and activities include sustainable farming and ranching, water management, educational outreach, wilderness preservation, women's rights and family planning, and rugby (international player and coach of USA national championship teams).



### **PETER HIRST**

Department of Horticulture and Landscape Architecture, Purdue University

Bio - Peter Hirst is professor of Horticulture at Purdue University, where he has served on the faculty since 1997. He received a BHortSci degree from Massey University in New Zealand and a PhD degree from The Ohio State University. His research has focused on the physiology, genetics and management of fruit trees, in particular apple. In recent years, his research has concentrated on understanding and manipulating flowering initiation which is a necessary precursor to reliable cropping, and on fruit development. Other areas of emphasis include the application of robotics and sensing technologies to fruit orchards, and the development of predictive computer models of growth and fruiting for educational and research applications. In his position as state extension specialist, Professor Hirst translates research data into strategies able to be implemented by growers. He is a guest professor at the Northwest Agricultural and Forestry University in China, and has communicated research results and recommendations to scientists and growers in many countries. He has been involved in addressing capacity building and food security in both Africa and Asia.



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### **KARTHIK KANNAN**

Krannert School of Management, Purdue University

*Bio* - Karthik Kannan is a Professor at Purdue's Krannert School of Management. He has served as academic director for the MBA programs (two-year MBA, STEM-MBA, Weekend MBA), academic co-director for MS in BAIM (Business Analytics and Information Management), and co-director for BIAC (Business Information and Analytics Center). Dr. Kannan is interested in "Designing for Human Instincts" as a way to organize businesses in the current age. Specifically, he studies how different aspects of information technology may be used to exploit human instincts and biases in order to nudge/manipulate behavior. He has applied related ideas in three primary research streams: pricing using auctions of information goods, pricing of data networks, and economics of information security. His papers have been accepted in several leading conferences and journals in the information systems area, including Management Science, Information Systems Research, Workshop on Information Technology and Systems, Workshop on Information Systems Economics, International Conference on Information Systems, and Conference on Information System and Technology. His papers have won the Best Paper Awards at the 10th and the 15th Annual Workshop on Information Technology and Systems. He currently serves/has served as an Associate Editor for Management Science, Information Systems Research, and MIS Quarterly. He is a member of AIS and INFORMS. He is also a CERIAS Fellow and Krannert's Faculty Fellow. Prior to joining Purdue, he obtained his PhD in information systems, MS in Electrical and Computer Engineering, and MPhil in Public Policy and Management all from Carnegie Mellon University. Before joining the graduate school, he worked with Infosys Technologies for a couple of years. His undergraduate degree is in Electrical and Electronics Engineering from NIT Trichy (formerly, REC Trichy).



### **JACQUELINE S. MCLAUGHLIN**

Department of Biology, The Pennsylvania State University, Lehigh Valley

*Bio* - Jacqueline McLaughlin is an Associate Professor of Biology at Penn State Lehigh Valley, and Founding Director of CHANCE (Connecting Humans and Nature through Conservation Experiences; [www.chance.psu.edu](http://www.chance.psu.edu)), Penn State's award-winning international environmental engaged-scholarship program. She earned her PhD in Cell and Developmental Biology from Rutgers University/University of Medicine and Dentistry of New Jersey, an MS in Cell and Developmental Biology from Florida State University and a BA in Biology/Chemistry from New College (Sarasota, FL). Whether working as a cell and developmental biologist on cancer cell lines or the embryonic vertebrate heart with her undergraduate students, or as a conservation scientist studying the effects of global climate change, habitat destruction, or pollution on ecosystem diversity and dynamics with high school teachers and undergraduates in the fields of Africa, Australia, China, Costa Rica, Cuba, Ecuador, Panama, and Peru, her overall mission is to create learning environments wherein students, at any level, are inspired and effectively learn science by engaging in real-world research. As a scholar, she has published, as an author or editor, over 45 publications in peer-reviewed books, journals, proceedings, and online environments, and has gratefully accepted numerous awards at the local, state, and national levels for excellence in teacher professional development, international programming and education, and her ultimate passion – undergraduate biology teaching and learning. She has been an active voice for the NSF/AAAS Vision and Change in Undergraduate Biology Education movement through an NSF TUES grant award and her research in developing effective CUREs (Course-based Undergraduate Research Experiences). Dr. McLaughlin's professional service is extensive, including the National Association of Biology Teachers, Society for Conservation Biology, Society of Developmental Biology, and the Undergraduate Research at the Capitol – PA event, to name only a few of her volunteer focal points. She has been a visiting professor at Jiangnan University (Wuxi, China) for nearly a decade, researching the pollution of the Chang Jiang (Yangtze River) and the eutrophication of Tai Hu (Lake Tai) with her Chinese students and colleagues.





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### JOHN F. MUTH

Electrical and Computer Engineering, North Carolina State University

*Bio* - John F. Muth is a professor of Electrical and Computer Engineering at North Carolina State University where he has served on the faculty since 1998. He received a BS in Applied Engineering Physics from Cornell University in 1988. Upon graduating he served as a submarine officer on fast attack nuclear submarines from 1988 to 1993. He received a PhD in condensed matter physics at North Carolina State University in 1998. His thesis specialized wide bandgap semiconductors and photonic devices. He also has made contributions to sensors, wearable electronics and underwater optical communications.

In 2008-2009 he was called back to active duty to serve in Iraq. His primary responsibility in Iraq was leading a team of military and civilian police officers. Embedded in the Iraqi Ministry of Interior, he worked with the senior Iraqi leadership on issues related to security and the rule of law. Since then, he cofounded the NSF Engineering Research Center ASSIST. The ASSIST Center focuses on ultralow power wearable devices that monitor physiological and environmental parameters. In 2014 he became Principle Investigator and CTO/Deputy Director for PowerAmerica. The PowerAmerica Institute is a private-public partnership funded by the Department of Energy, Industry and Universities, and is part of the National Network of Manufacturing Institutes now called Manufacturing USA. The mission of PowerAmerica is to increase US manufacturing capacity, to create jobs and to accelerate the adoption of wide bandgap semiconductors into power electronics. These technology innovations will make power electronic systems significantly smaller, lighter and more energy efficient. In the classroom Professor Muth has taught a variety of nanoelectronics, photonics and product innovation courses. He has over 130 publications, 9 patents and has received a variety of awards including a Bronze Star for meritorious service in Iraq.



### JUAN CLAUDIO NINO

Department of Materials Science and Engineering, University of Florida

*Bio* - Juan Claudio Nino is an Endowed Professor in the Department of Materials Science and Engineering at University of Florida (UF) in Gainesville, FL. He obtained his bachelor's degree in Mechanical Engineering in 1997 at Los Andes University (Bogotá, Colombia). He was a Lecturer at the Colombian Engineering School before joining The Pennsylvania State University in 1998, where he completed his doctoral degree in Materials Science and Engineering in 2002. After a postdoctoral appointment focusing on ferroelectric thin films at the Materials Research Institute (State College, PA), he joined UF in fall 2003 as an Assistant Professor. Since then, he has established the Nino Research Group (NRG) with a main focus of the investigation of advanced energy materials towards enhancing their efficiency, performance, and sustainability. He received tenure with promotion to Associate Professor in 2008, and was promoted to Professor in 2013. His research at NRG on ceramics, polymers, bio-inspired materials, and their composites has resulted in 120 publications and five patents. Dr. Nino's current research focus includes optimization and development of advanced functional materials for: (a) energy conversion and storage, (b) high frequency and high temperature electronics, (c) neural networks, and (d) semiconductors and scintillators for radiation detection. He is a recipient of the CAREER and the American Competitiveness and Innovation awards by the US National Science Foundation. In 2009 he received the J Bruce Wagner Jr Young Investigator Award from the Electrochemical Society. In 2014 he received the Fulbright US Scholar Innovation and Technology Award from the US Department of State. In 2016 he served as Expert within the Division of Materials Research at the US National Science Foundation. He is an Associate Editor for the Journal of the American Ceramics Society, and a Coordinating Editor for the Journal of Electroceramics.



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### SONAK PASTAKIA

College of Pharmacy, Purdue University



*Bio* - Sonak Pastakia serves as an Associate Professor at Purdue University, adjunct faculty at Indiana University, and visiting lecturer at Moi University, and, since 2007, spends 10-11 months per year on site in Kenya. Within these faculty appointments he fulfills a wide variety of roles including, being a founding member and a member of the board of directors of the Tumaini Street Youth Center, serving as co-chair of the Academic Model Providing Access to Health Care (AMPATH) Pharmacy department, and being the acting chair of the AMPATH Cardiovascular/ Chronic Disease Management Working Group. Over the past 9 years in Kenya, he has focused on implementing a wide variety of programs including a rural diabetes care program which currently serves over 8000 patients and has screened over 50,000 people, a portabilized care system linked to microfinance groups which provides chronic disease management services entitled BIGPIC, a pharmacy distribution system which provides antiretroviral medications to over 150,000 HIV-infected patients receiving care at 500 clinics throughout western Kenya, a large multi-country gestational diabetes study in low- and middle- income country settings, and an anticoagulation monitoring program which serves over 2200 patients and has a focus on rheumatic heart disease. He has helped layer on robust infrastructure to research the many different facets of the aforementioned care programs with a particular emphasis on diabetes. He also spends a considerable amount of time teaching future leaders in Global Health through his diverse faculty positions at North American and Kenyan Universities. In addition to his work in Kenya, he has several ongoing research and care efforts focused on diabetes and population health in India.

### GAD PERRY

Department of Natural Resources Management and Office of International Affairs,  
Texas Tech University



*Bio* - Gad Perry is a professor of Conservation Science and the Senior Director of the International Research and Development Division (IRDD) at Texas Tech University (TTU). He has served on the faculty at TTU since 2002 and heads the IRDD since its creation in 2014. He received a BSc in Biology and an MSc in Zoology from Tel Aviv University in Israel, where he was born, and a PhD in Zoology from the University of Texas at Austin. His main research interest centers on conservation biology, with particular emphasis on invasive and endangered species issues. Dr. Perry is interested in the application of biological insights to real-world problems. He is a member of the IUCN invasive species and iguana specialist groups and has conducted field studies in the British Virgin Islands, Costa Rica, Ethiopia, Guam, Israel, and the US, among others. Recent trips related to his IRDD role have included China, Ethiopia, Germany, Guyana, and Oman. Current and recently-completed student projects involve reptile ecology in Madagascar, biogeography in the Caribbean, iguana conservation in the Virgin Islands, sustainable civet use in Ethiopia, and urban ecology of birds in Lubbock, Texas. Dr. Perry has worked extensively with international colleagues in many countries. He has served as the Editor of the *Journal of Herpetology*, in addition to several past and ongoing stints as Associate and Section Editor for various other journals. He also serves as the Director of the International Center for Arid and Semi-Arid Land Studies at TTU. His teaching currently includes international ecology and conservation courses (alternately visiting Costa Rica, Ethiopia, and Zimbabwe) and a graduate course on scientific writing at TTU, as well as a graduate-level courses for Ethiopian civil engineers taught as part of a European-funded capacity-building project. A long-term advocate for faculty governance, he has served in elected office on both the TTU Faculty Senate and the local and state chapters of the American Association of University Professors.

### FRANCIS E. “JACK” PUTZ

Department of Biology, University of Florida  
Email: fep@ufl.edu



*Bio* - Jack Putz is a Distinguished Professor of Biology and Forestry at the University of Florida where he has been a faculty member since 1982. He also holds an honorary

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professorship at Utrecht University in the Netherlands. He received his undergraduate education at the University of Wisconsin, served as a Peace Corps Volunteer at the Forest Research Institute Malaysia, has a PhD from Cornell University, was a NATO Post-Doctoral Fellow at the Tropical Forestry Institute at Oxford University, and was a Bullard Fellow at Harvard University. His research focuses on the ecological basis of environmentally sound and economically viable tropical forest management, but he also studies issues related to savanna ecology and restoration, non-timber forest products, and ethnobotany. Much of his work is based on market-based incentives for improved management; he started working on forest certification in the 1980s and ran a forest-based carbon offset project in Malaysia in the 1990s. Dr. Putz' current research on landscape-level land-use planning for conservation and development is based mostly in Indonesia and Mexico, but he is also involved in projects in Guyana and Malaysia. Since receiving his undergraduate degree in education in 1973, he has actively promoted science-based approaches to pedagogy both at his university and with the institutions and individuals with whom he works around the world. Along the way he's published more than 300 research articles, essays, and reviews, and also popular magazine and newspaper articles on natural history and nature conservation issues.

### OMOWUNMI “WUNMI” SADIK

Department of Chemistry, State University of New York at Binghamton

*Bio* - Omowunmi “Wunmi” Sadik is a Professor of Chemistry and the founding Director of the Center for Research in Advanced Sensing Technologies and Environmental Sustainability (CREATES) at the State University of New York at Binghamton (SUNY Binghamton), where she has been a member of the faculty since 1996. She is also the President and Co-Founder of the Sustainable Nanotechnology Organization (SNO) ([www.susnano.org](http://www.susnano.org)), a non-profit, international professional society dedicated to advancing sustainable nanotechnological solutions around the world through education, research, and the promotion of the responsible growth of nanotechnology. Dr. Sadik received her BS and MS in chemistry from the University of Lagos (Nigeria) and her PhD in chemistry from the University of Wollongong (Australia). She has held appointments at Harvard, Cornell University and the Naval Research Laboratory. Dr. Sadik's research areas are in surface chemistry, chemical sensors and biosensors, and in their application to solving real-life problems in biological systems, energy and the environment. Dr. Sadik holds five U.S. patents for her work on biosensors and nanostructured membranes. She has authored over 160 scientific publications, and has given over 350 invited lectures and conference contributions across the world. Some of Dr. Sadik's notable career highlights include being a recipient of: the National Academy of Sciences Collaboration in Basic Science & Engineering Fellowship (2000), the SUNY Research Foundation's Award for Outstanding Inventor (2002), the Harvard University Radcliffe Fellowship (2003), the NSF Discovery Corps Senior Fellowship (2005), and the SUNY Chancellor's Award for Research (2011). In addition, Dr. Sadik is a Fellow of the Royal Society of Chemistry (2010), a Fellow of the American Institute for Medical and Biological Engineering (2012) and a 2015-2017 Sigma Xi Distinguished Lecturer. In 2016, Dr. Sadik became only the fourth woman and the first female scientist to be conferred with the Nigerian National Order of Merit (NNOM) Award, Nigeria's highest national honor for academicians.



### ELISABETH SMELA

Department of Mechanical Engineering, University of Maryland

*Bio* - Elisabeth Smela is a professor of Mechanical Engineering at the University of Maryland, where she has served on the faculty since 2000, and she also holds an appointment in the Institute for Systems Research. She received a BS in physics from MIT and MS and PhD degrees in electrical engineering from the University of Pennsylvania. As a graduate student she spent a summer working in Tsukuba, Japan through the NSF Summer Institute. Dr. Smela worked as a postdoc and research scientist in Linköping, Sweden and then in Risø, Denmark before becoming Vice President of Research and Development at Santa Fe Science and Technology, New Mexico.





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Dr. Smela's interdisciplinary research interests center on microfabricated electroactive polymer (EAP) actuators and on sensors that include an organic or polymeric component. She microfabricated conjugated polymer actuators for the first time and more recently demonstrated electrokinetically-driven hydraulic polymer actuators. She is developing simple large-area tactile sensors based on latex and nano-carbon composites for cancer detection and for use in touch-sensitive skins for robots. She was also part of a team that created a "bionose" on a chip that employs living olfactory sensory neurons on the surface of a custom chip to detect odorants. Her teaching includes mechatronics, microfabrication, statistics, and materials science, and she has participated in Engineers without Borders.

Upon beginning a faculty member, Dr. Smela was awarded an NSF Presidential Early Career Award for Scientists and Engineers (PECASE), the DuPont Young Professor Award, the Outstanding Invention Award from the University's Office of Technology Transfer, and the E. Robert Kent Junior Faculty Teaching Award. More recently, she was recognized with the EAPromising European Researcher Award from the European Society for Electromechanically Active Polymer Transducers and Artificial Muscles.

### **PATRICIA A. SOBECKY**

Office for Academic Affairs, Department of Biological Sciences, The University of Alabama

*Bio* - Patricia Sobecky is the Associate Provost for Academic Affairs at the University of Alabama (UA) and a Professor in the Department of Biological Sciences. She received a BS in Biology from the University of Pittsburgh at Johnstown and a PhD in microbiology from the University of Georgia. Her postdoctoral fellowship was with Dr. Donald Helinski at the University of California, San Diego. Prior to joining UA in 2009 to serve as chair of the Biological Sciences Department, she was a tenured Associate Professor in the School of Biology at the Georgia Institute of Technology. In her role as UA Associate Provost, she leads a number of campus-wide collective network initiatives including the UA STEM Forward Initiative to broaden the participation of individuals from traditionally underserved and/or underrepresented groups in the science, technology, engineering and mathematics fields. She also leads the UA Project Rising Tide Retention and Student Success Initiative. As an active researcher, she and colleagues are currently funded by the Gulf of Mexico Research Institute to assess the impact of the 2010 Gulf of Mexico oil spill disaster on biodiversity and ecosystem services in marshes and nearshore habitats. She has authored 65 scientific publications, and has been funded by the Office for Naval Research, the Department of Energy, the National Science Foundation, and industry. Dr. Sobecky served as chief scientist for oceanographic and manned submersible cruises in the Gulf of Mexico, and serves as an editor for an international journal. Her teaching ranges from introductory-level courses in biology to advanced lecture and laboratory in microbial ecology, pathogenic microbiology, and molecular biology. She is an advocate for access to educational opportunities, for women and women of color in STEM fields, science outreach, environmental justice and community empowerment, through developing programs that bring academic, industry, and government sectors together to solve the local, regional, national, and global issues of the 21st century. In recognition of her research accomplishments, she was elected fellow of the American Association for the Advancement of Science (AAAS) in 2016.



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### **BARRETT CALDWELL**

Industrial Engineering, Aeronautics, & Astronautics, Purdue University

*Bio* - Barrett S. Caldwell is Professor of Industrial Engineering (and Aeronautics & Astronautics) at Purdue. He has a PhD (Univ. of California, Davis, 1990) in Social Psychology and BS degrees in Aeronautics and Astronautics and Humanities (MIT, 1985). His research team, the Group Performance Environments Research (GROUPER) Laboratory, examines



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and improves how people get, share, and use information well. GROUPER research highlights human factors engineering approaches to information flow, task coordination, and team performance in settings including aviation, healthcare, and spaceflight mission operations. Prof. Caldwell has advised or co-advised over 30 MS thesis students and 15 PhD students, and published over 150 scientific publications; current GROUPER research is funded by sources including AHRQ, FAA, NASA, and VA. He is a Fellow and Past Secretary-Treasurer of the Human Factors and Ergonomics Society (HFES), a Purdue University Faculty Scholar, and Director of the NASA-funded Indiana Space Grant Consortium, promoting STEM education throughout Indiana.

### **State Department Profile**

**Bureau of East Asian and Pacific Affairs**

**Office of Japanese Affairs**

Prof. Caldwell's 2016-17 Fellowship appointment is to the Bureau of East Asian and Pacific Affairs, Office of Japanese Affairs ("the Japan Desk"). In this role, Prof. Caldwell supports a wide range of environment, science, technology, and health aspects of the U.S. – Japan alliance, with a particular emphasis on science and technology innovation (STI). He has been involved with projects addressing STI directions in the context of future societal needs, and specific activities including Cancer Moonshot, STI and science diplomacy, and bilateral and trilateral (with the Republic of Korea) initiatives incorporating emerging technologies.

### **MEREDITH GORE**

Fisheries & Wildlife, Michigan State University

Bio - Meredith Gore is a conservation social scientist whose interdisciplinary research explores relationships between human behavior and the environment. She is an Associate Professor in the Department of Fisheries & Wildlife and School of Criminal Justice at Michigan State University (MSU). Dr. Gore is a MSU Global Research Fellow and President of the Society for Conservation Biology's Social Science Working Group. Her research interests focus on community-based natural resource management and enhancing understanding of risk concepts and their application to biodiversity conservation. Dr. Gore co-developed the Conservation Criminology research framework and teaching certificate program at MSU; the interdisciplinary approach synthesizes natural resource policy, risk and decision analysis, and crime science. Her leadership in this field has resulted in new scientific insight regarding conservation of species such as white sharks, lemurs, cranes, sea turtles, rhinos, elephants, ploughshare tortoises, double-crested cormorants, black bears and gray wolves.



Dr. Gore received her PhD in Natural Resource Policy and Management from Cornell University, MA in Environment and Resource Policy from George Washington University, and BA in Anthropology and Environmental Studies from Brandeis University. Phi Kappa Phi has recognized Dr. Gore's leadership in interdisciplinary research. She is a member of the Society for Risk Analysis, Society for Conservation Biology, Wildlife Society, and International Association for Society and Natural Resources. NSF, USDA, and Michigan Department of Natural Resources have helped fund Dr. Gore's research; her students have received awards from NSF, Fulbright, Jane Goodall Institute, and Great Lakes Leadership Academy. Dr. Gore's research has been profiled by National Public Radio, The New York Times, British Broadcasting Corporation and multiple Malagasy newspapers.

### **State Department Profile**

**Bureau of Intelligence and Research**

**Office of the Geographer and Global Issues**

Meredith Gore serves as a senior science advisor in the Office of the Geographer and Global Issues, Bureau of Intelligence and Research. Dr. Gore provides all-source intelligence support and briefings on conservation issues to high level policy makers in the Bureau of Oceans, Environment, and International and Scientific Affairs, the Bureau of International Narcotics and Law Enforcement, and the Office of the Science and Technology Adviser to the



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Secretary of State. She assists the State Department in its leadership on the Presidential Task Force on Wildlife Trafficking and other efforts under the US Strategy to Combat Wildlife Trafficking. Dr. Gore writes analysis and intelligence assessments for senior Department and US Government officials on environment, science, technology and health issues, including wildlife trafficking, illegal fishing, illegal logging, climate change, health security, and other scientific and technical issues that influence foreign policy and national security. During her tenure at the State Department, Dr. Gore leverages her scientific expertise in conservation criminology to help investigate, in particular, the linkages between criminal activity and wildlife trafficking, including the convergence in different types of illegal trafficking networks.

### **ROBERT HEIMER**

Epidemiology, Yale School of Public Health

Bio - Dr. Robert Heimer is a professor in Epidemiology of Microbial Diseases at the Yale School of Public Health. His major research efforts over the past twenty-five years have included scientific investigation at the interface of addictive disorders and infectious disease. Areas of investigation include pharmacological treatment of opiate addiction, HIV, hepatitis C, and hepatitis B epidemiology, and overdose prevention and resuscitation. His highly interdisciplinary research evaluates the effectiveness of intervention programs and on the contexts and consequences of drug abuse that provide information needed to assist educational and advocacy efforts. Dr. Heimer is senior member of the Interdisciplinary Research Methods Core at Yale's Center for Interdisciplinary Research on AIDS (CIRA). The Core's missions are to provide centralized expertise in quantitative methods and biostatistics, qualitative methods and ethnography, and molecular epidemiology and offer resources for research design and for the collection, management, and analysis of data. Dr. Heimer also serves as the Director of the Yale office of the Connecticut Emerging Infections Program. This Centers for Disease Control and Prevention-funded program is one of ten programs nationwide that seek to assess, through population-based surveillance, the public health impact of emerging infectious diseases and to evaluate methods for their prevention and control in the community. The Yale program currently focuses on influenza, foodborne illnesses, and community-acquired *Clostridium difficile* infections, the impact human papillomavirus vaccination, and Lyme disease prevention and medical costs. Dr. Heimer received his training in molecular biology and pharmacology at Columbia College (BA) and Yale University (MA, PhD). He began his work on the prevention of HIV among injection drug users in 1990 with an evaluation of the city-run New Haven needle exchange program and his work on emerging infections in 1995 with studies of the tick-borne agents of human anaplasmosis and ehrlichiosis.



### **DAVID JILES**

Electrical and Computer Engineering, Iowa State University

Bio – David Jiles was educated in the United Kingdom and earned a BSc in Physics and Mathematics, a PhD in Applied Physics, and a DSc in Physics. His research interests include magnetism and magnetic materials, nonlinear and hysteretic behavior of magnetic materials; magnetoelasticity, magnetostriction, and magnetomechanical effects; development of novel magnetic materials; and biomedical engineering applications, including the development of transcranial magnetic stimulation (TMS) for noninvasive treatment of brain disorders. He is the holder of the Palmer Endowed Department Chair in Electrical and Computer Engineering at Iowa State University. He also is Anson Marston Distinguished Professor of Engineering at Iowa State University. Immediately prior to that, he was the Director of the Wolfson Centre for Magnetics and Professor of Magnetics at Cardiff University in the United Kingdom where he was a Royal Society Research Fellow. In addition he has extensive overseas experience having spent time living and working in the United Kingdom, New Zealand, Canada, Germany, Austria, the Czech Republic and India. He holds rank of Senior Scientist in the Ames Laboratory of the U.S. Department of Energy, is an Honorary Professor at Cardiff University School of Engineering, and is a Visiting Professor at Sheffield University Department of Materials Science and Engineering.



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He has authored more than 600 scientific papers, holds 19 patents and has published 3 books: "Introduction to Magnetism and Magnetic Materials", 3rd edition 2015; "Introduction to the Electronic Properties of Materials", 2nd edition 2001; and "Introduction to the Principles of Materials Evaluation", 1st edition 2007. He served as editor-in-chief of IEEE Transactions on Magnetics from 2005-2011. He has served five terms on the Administrative Committee of the Magnetics Society beginning in 1996 and has recently been elected for a sixth term. He is a Fellow of Royal Academy of Engineering, and a Fellow of the Institute of Electrical and Electronics Engineers, the Magnetics Society, the American Physical Society, the Institution of Electrical Engineers, the Institute of Physics, the Institute of Materials, and Institute of Mathematics and its Applications. He is also an Honorary Fellow of the Japan Society for the Promotion of Science and an Honorary Fellow of the Indian Society for Nondestructive Testing. Member HKN (eta-kappa-nu, the Electrical Engineering Honor Society), a Member of the Board of Governors of IEEE-HKN (2013-15) and a Member TBP (tau-beta-pi, the Engineering Honor Society). He is included in Marquis "Who's Who in the World", (all years from 2000 - 2016) and in "Who's Who" by A. & C. Black, publisher of the original Who's Who since 1849.

### **USAID Profile**

#### **Bureau for Europe and Eurasia Technical Services Office**

David Jiles served as a senior science advisor in the Technical Services Office (TSO) of the Bureau for Europe and Eurasia (EE) within the US Agency for International Development. He studied developments in cyber security and how these could be used to mitigate threats to cyber security in the EE region. The project aimed to improve the continuity of electricity supply in the Black Sea countries (Moldova, Ukraine, Georgia and Armenia) by seeking to improve cyber security for the electric power grids and advising operators and regulators in these countries about how cyber security threats could best be addressed.

### **KAREN LIPS**

Sustainable Development and Conservation Biology, University of Maryland, College Park

**Bio** - Dr. Karen Lips is Professor of Biology and Director of the Graduate Program in Sustainable Development and Conservation Biology at the University of Maryland, College Park. Dr. Lips received a B.S. in Zoology from the University of South Florida, and a Ph.D. in Biology from the University of Miami. She is a field ecologist who studies how global change – wildlife disease, climate change, land use – affects biodiversity of amphibians and reptiles in Latin America and the U.S., especially the Appalachian Mountains. A primary focus of her research is determining the ecological and environmental factors that influence amphibian species' response to disease, and how that information might be used in conservation and recovery plans. She is also interested in how the loss of biodiversity affects communities and ecosystems, and how human activities such as trade and exotic species contribute to the spread of disease and loss of biodiversity. Dr. Lips is a Research Associate at the Smithsonian Tropical Research Institute and at the U.S. Museum of Natural History. Dr. Lips has published more than 100 peer-reviewed papers on amphibian ecology, host-pathogen ecology, and tropical biology. She co-organized RANA, an NSF-funded international network of researchers working on amphibian disease ecology throughout Latin America, and has offered many training courses in amphibian ecology and biodiversity sampling. She was named a Leshner Leadership Institute Public Engagement Fellow in 2015, an AAAS Fellow in 2011, and a Leopold Leadership Fellow in 2005. She was awarded the President's Award of the Chicago Zoological Society in 1997, a Bay and Paul Biodiversity Leadership Award in 1998, and the Sabin Amphibian Conservation Award in 2012. In 2015, she received the inaugural University of Maryland Impact Communicator Award. Dr. Lips is interested in increasing engagement on environmental issues, promoting scientific leadership, and fostering international scientific collaborations.



# Jefferson Science Fellows 2004–2017

## **State Department Profile**

**Bureau of Western Hemisphere Affairs**

**Office of Public Affairs and Public Diplomacy**

Karen Lips served as an advisor in WHA/PDA on issues related to environmental science, climate change, sustainable development, emerging infectious diseases, STEM education, and women in STEM. She supported office programs such as the 100000 Strong in the Americas, the Young Leaders of the Americas Institute, and various science and education-themed International Visitors Leadership Programs. In addition to supporting her colleagues in WHA in DC Karen traveled to posts in the region to talk with science leaders, government officials, and educators about science and educational issues. Karen is part of several groups working on ways to promote greater coverage of science in the media, and to strengthen collaborations between scientists and policymakers in Latin America and the Caribbean.

## **SHELIE MILLER**

Natural Resources and Environment, University of Michigan

*Bio* - Dr. Shelie Miller is an Associate Professor in the School of Natural Resources and Environment at the University of Michigan, with a joint appointment in the Department of Civil and Environmental Engineering. Dr. Miller holds a Ph.D. in Civil and Materials Engineering from the University of Illinois at Chicago. Her research identifies potential unintended environmental consequences of emerging technologies and finds possible design or policy interventions that will lead to sustainable outcomes. Her research group uses life cycle assessment (LCA) and scenario modeling tools to analyze a variety of systems, including bioenergy, the food-energy-water nexus, hydraulic fracturing, and new vehicle technologies. Dr. Miller was awarded a Presidential Early Career Award in Science and Engineering (PECASE) in 2009 and was recognized as a Kavli Frontiers Fellow by the National Academy of Sciences in 2013. She serves in a variety of advisory roles for government, non-government, and academic entities.



## **USAID Profile**

**Global Development Lab**

**Center for Development Innovation**

Dr. Miller is a member of the Applied Innovation and Acceleration team within the Center for Development Innovation. The Center supports the discovery, incubation, and testing of development solutions through science, technology, innovation, and partnerships. Dr. Miller works on a variety of projects designed to accelerate innovations to achieve scale within the developing world. She has contributed to initiatives that match Lab-supported innovations with potential adopting partners and participates in the Securing Water for Food program, which is a Grand Challenge for Development. One of her major projects is to analyze the effectiveness of various forms of technical assistance to help innovators achieve scale. She also serves as the Lab environmental compliance coordinator.

## **SHARMILA MUKHODAPHYAY**

Materials Science and Engineering, Wright State University

*Bio* - Dr. Sharmila Mitra Mukhodaphyay is Professor of Materials Science and Engineering at Wright State University and Director of the Center for Nanoscale Multifunctional Materials. She obtained her B.S. and M.S. degrees from Indian Institute of Technology and Ph.D. from Cornell University. As a Wright State faculty member, she has received several awards, including the Excellence in Research Award (2004), the Outstanding Faculty Award (2011), and the Trustees' Award for Faculty Excellence (2011), which is the highest award given by the university to a faculty member. She is listed in multiple Who's Who





## Jefferson Science Fellows 2004–2017

publications such as "Who's Who in the World," "Who's Who in America," and is an elected Fellow of the American Ceramic Society.

Dr. Mukhopadhyay's academic focus has been at the crossroads of nanotechnology and nano-biosciences, and encompasses the following areas: design of safe and sustainable nanomaterials for energy, environment, and biomedical applications; fundamental investigation of surface and interface phenomena; and promotion of multidisciplinary engineering education. Current significant research involves the creation of novel bio-mimetic hierarchical structures that utilize the benefits of nanomaterials while minimizing their environmental risks. These materials have, to date, resulted in the generation of new catalysts, energy storage materials, antibacterial surfaces, biosensors, and bone/muscle tissue scaffolds. Her work has been featured in over a dozen media releases, such as the Homeland Security News Wire, AzoNano, PhysOrg, Dayton Daily News, Ceramic Bulletin and Dayton Business Journal. She has published over a hundred papers, books, chapters and reports. Additionally, she has obtained and directed over forty-five research grants from a wide variety of federal and state sponsors, such as NSF, DOE, AFOSR, AFRL, NASA, EPA, and OBOR, as well as industrial sponsors, such as P&G. Dr. Mukhopadhyay has also organized several national and international symposia, and serves on editorial boards of journals, on review panels of funding agencies, and on executive committees of several professional societies.

### **State Department Profile**

**Bureau of Economic and Business Affairs**

**Commercial & Business Affairs**

**Intellectual Property Enforcement**

Dr. Mukhopadhyay serves as a senior scientific advisor in the Bureau of Economic and Business Affairs. She is leveraging her science and engineering expertise to create linkages between cutting-edge technical innovations and governmental entities focused on economic development. This includes assisting the State Department in advancing US leadership role in the rapidly expanding area of nanotechnology, which impacts both emerging and traditional industrial sectors such as biotech and pharma, transportation, communication, infrastructure, energy, environment, and consumer products. She is building a working group within the Department of State that will engage the high-tech innovation and entrepreneurship hubs within academia and industry in areas of intellectual property, international technology sharing and bilateral/multilateral regulatory framework. Another effort is to highlight emerging technologies as a focus area within the Global Entrepreneurship Program (GEP) of the US Government.

### **SUMANT NIGAM**

Atmospheric, Oceanic, and Earth System Science, University of Maryland, College Park

Bio - Sumant Nigam is a Professor of Atmospheric, Oceanic and Earth System Science at the University of Maryland. His research interests include atmospheric general circulation and teleconnections, climate dynamics, tropical ocean-atmosphere interaction, aerosols and Asian monsoon, and Great Plains hydroclimate variability and droughts. A current focus is unraveling the natural variability and secular change components of the climate record to advance understanding of the recent warming of the northern continents. Dr. Nigam got his M.Sc. degree in Physics from the 5-year integrated program at the Indian Institute of Technology, Kanpur, supported by the National Science Talent scholarship. He obtained his Ph.D. in Geophysical Fluid Dynamics from Princeton University in 1984, and postdoctoral training at the Massachusetts Institute of Technology.



Dr. Nigam chairs the Climate Variations and Change Committee of the American Meteorological Society and the Advisory Panel for NCAR's Climate and Global Dynamics Laboratory. He also serves on the International Commission on Dynamic Meteorology. Dr. Nigam was a member of the Climate Research Committee and the Board of Atmospheric Sciences and Climate of the U.S. National Academies of Sciences, Engineering, and Medicine from 2008-2012. He previously served as co-chair of the Climate Variability working group of NCAR's Community Climate

## Jefferson Science Fellows 2004–2017

System Model, Editor of the Journal of Climate, and as Director of the Large-scale Dynamic Meteorology program at the U.S. National Science Foundation. Dr. Nigam is a Fellow of the American Meteorological Society and the Royal Meteorological Society. Dr. Nigam was featured on the cover of Science in May 2004 in connection with a report on foreign born U.S. scientists, titled “Brains & Borders: Many Origins, One Destination.”

### **State Department Profile**

**Bureau of East Asian and Pacific Affairs  
Office of Multilateral Affairs**

Sumant Nigam serves as Senior Science Advisor on climate, water, and environmental issues in Southeast Asia. He leads the development of comprehensive, scientifically-informed US initiatives in the Lower Mekong, taking into account environmental, economic, and energy concerns of the countries for which Mekong River is the lifeblood. Sumant has developed a strategic plan for providing near-term hydroclimate predictions as well as decadal-to-multidecadal projections of regional precipitation and streamflow for the region using both ground and space-based observations of the regional water cycle and the cutting-edge meteorological forecasts and climate model projections. Dr. Nigam has traveled to the region and consulted with several institutions, including the Mekong River Commission, in an effort to mobilize and steer regional scientific interest, excitement, and expertise on environmental stewardship to help advance the US-led Lower Mekong Initiative.

### **OLADELE OGUNSEITAN**

Population Health and Disease Prevention, University of California, Irvine

*Bio* - Oladele (Dele) Ogunseitan is professor of Public Health and founding Chair of the department of Population Health and Disease Prevention at the University of California, Irvine, where he is also professor of Social Ecology. After undergraduate and graduate training at the University of Ife, Nigeria, he earned his doctorate in microbiology at the University of Tennessee, and his Master of Public Health at the University of California, Berkeley, where he also earned a certificate in International Health. He is alumni faculty fellow of the Belfer Center for Science and International Affairs at the Kennedy School of Government, Harvard University. At UC Irvine, he directed workforce development for the NIH-funded Institute for Clinical and Translational Science; and the evaluation component of the CDC-funded Orange County Partnerships to Improve Community Health. He serves on the Board of Directors of the University of California Global Health Institute, and on the Board of Directors of the Association of Schools and Programs in Public Health. He is a member of the Hoover Medal Board of Award, and Vice Chair of the Materials and Society committee of the Minerals, Metals and Materials Society. He researches the nexus of industrial development, environmental quality and human health. He is the author of *Microbial Diversity* (Blackwell-Wiley, 2005) and editor of *Green Health* (Sage, 2011). He was the founding editor of *African Journal of Environmental Science and Technology*. His articles have appeared in *Science*, *The Lancet Global Health*, *Bulletin of the World Health Organization*, *Environmental Health Perspectives*, *Environmental Management*, and *Environmental Science & Technology*.



### **State Department Profile**

**Bureau of Oceans and International Environmental and Scientific Affairs  
Office of International Health and Biodefense**

Oladele (Dele) Ogunseitan is a Jefferson Science Fellow in OES/IHB, where he shares his expertise and support to the U.S. Department of State's international action plans to reduce risks posed by the proliferation of antimicrobial-resistant pathogens. The "Antimicrobial Lifecycle Mapping" project aims to develop tools enabling low-infrastructure community strategies to map antimicrobial sources, sinks, and consequences. Such maps are crucial for raising awareness of the threats posed by antimicrobial resistance, and developing consensus to mitigate the global threat and to reduce the burden of illness and death due to resistant pathogens. Through this work and related projects, Dele will also interact with IHB teams charged with implementing the President's Global

## Jefferson Science Fellows 2004–2017

Health Security Agenda and the institutionalization of Pandemic Response strategies within the Department of State.

### **KATHLEEN PURVIS-ROBERTS**

Chemistry & Environmental Science, Pitzer College

*Bio - Kathleen (Katie) Purvis-Roberts is a Professor of Chemistry & Environmental Science in the W.M. Keck Science Department at Claremont McKenna, Pitzer, and Scripps Colleges in Claremont, CA where she has taught for the past 14 years. She is currently serving as the Assistant Vice President for Student Development at Pitzer College after two years as Associate Dean of Faculty. Katie received a B.A. in chemistry from Westmont College, a Ph.D. in physical chemistry from Princeton University and performed postdoctoral research at the National Center for Atmospheric Research. Her research focuses on characterizing the water soluble component of Secondary Organic Aerosol formation from alkyl amines and alcohol amine precursors and the perceptions of risk and environmental impacts of nuclear testing near Semipalatinsk, Kazakhstan. Her research is supported by the National Science Foundation. In 2013 she was awarded a prestigious Henry Dreyfus Teacher-Scholar award from the Camille and Henry Dreyfus Foundation. She has supervised over 45 undergraduate students in her air pollution research lab. She is the co-author of two environmental chemistry textbooks, Chemistry in Context for non-majors and Chemistry of the Environment for majors. She is also on the Executive Board of the Association for Environmental Studies and Sciences.*



### **State Department Profile**

**Bureau of East Asian and Pacific Affairs  
Office of Economic Policy**

Katie Purvis-Roberts serves as a Foreign Affairs Officer in EAP/EP. The office coordinates the annual Asia-Pacific Economic Cooperation (APEC) forum, and she oversees the Policy Partnership for Women and the Economy (PPWE) working group for EP. The goal of PPWE is to advance the economic integration of women in the Asia-Pacific region, which includes an emphasis on increasing the number of Women in Science, Technology, Engineering, and Math (STEM) across APEC economies. Katie is also in the process of organizing a workshop under the Energy Working Group (EWG) to use a Life-Cycle Impact Assessment of Clean Energy investments, which will help representatives from APEC Economies make an economic argument for the health and environmental impacts of different energy sources. During her first month in EAP/EP, Katie was the Point of Contact for the Bureau of East Asian and Pacific Affairs for foreign governments attending the Our Ocean Conference.

### **K.P. SUBBALAKSHMI**

Electrical and Computer Engineering, Stevens Institute of Technology

*Bio - Dr. K.P. (Suba) Subbalakshmi is a Professor in the Department of Electrical and Computer Engineering, Stevens Institute of Technology. Her research interests lie in the areas of cognitive radio networking and security, cognitive mobile cloud offloading, Internet and social media data analytics and security. She is a Co-Founder & Chief Scientist of two technology start-up companies that commercialize her research in cognitive radio networks and data mining. She is a recipient of a New Jersey Inventors Hall of Fame Innovator Award for her work on detecting deception from text content. Her deception detection tool has been accessed by users from more than 15 countries and has received wide press coverage. She is a Subject Matter Expert for the National Spectrum Consortium. Her work on cognitive radio networking is featured in the U.S. governments Wireless Spectrum Research and Development (WSRD), Senior Steering Group (SSG) Suggested Readings. Her cognitive radio router provides low cost wireless connectivity to a rural school in South Africa. She is a Founding Associate Editor of the IEEE Transactions on Cognitive Communications and Networking and the Founding Chair of the Security Special Interest Group in IEEE COMSOC's Technical Committee*





## Jefferson Science Fellows 2004–2017

on Cognitive Networks (TCCN). She has given several keynote addresses, tutorials and short courses as well as served as a panelist in several prestigious international conferences. She serves/has served as an Associate Editor for several IEEE journals and frequently organizes international conferences and workshops.

### **State Department Profile**

**Bureau of Economics and Business Affairs**

**Office of Multilateral Affairs, Office of International Communications and Information Policy**

K.P. (Suba) Subbalakshmi serves as a senior science advisor in EB/CIP/MA, working on Internet of Things, 5G, Smart Cities and Security and Privacy issues. In addition to supporting her colleagues in CIP/MA and EB in general, Suba interacts with several governmental agencies including, the National Security Council, National Institute of Standards and Technology, Federal Communications Commission, Federal Trade Commission and the Department of Homeland Security. She follows the developments of standardization bodies including the International Telecommunication Union (ITU) and Organization for Economic Co-operation and Development (OECD).

### **KATHLEEN VOGEL**

Political Science, North Carolina State University

*Bio* - Kathleen M. Vogel is an associate professor in the School of Public Policy, University of Maryland, College Park. She was previously an associate professor in the Department of Political Science/Science, Technology, and Society Program at North Carolina State University (NC State). Vogel holds a Ph.D. in biological chemistry from Princeton University. Prior to joining the NC State faculty, Vogel was a tenured associate professor at Cornell University with a joint appointment in the Department of Science and Technology Studies and in the Judith Reppy Institute for Peace and Conflict Studies. Previously, she has been appointed as a William C. Foster Fellow in the U.S. Department of State's Office of Proliferation Threat Reduction in the Bureau of Nonproliferation. Vogel has also spent time as a visiting scholar at the Woodrow Wilson International Center for Scholars, Cooperative Monitoring Center, Sandia National Laboratories, and the Center for Nonproliferation Studies, Monterey Institute of International Studies.



Her research focuses on studying the social and technical dimensions of bioweapons and emerging life science threats and the production of knowledge and big data in intelligence assessments. Vogel has been asked to serve on high level science advisory panels on issues related to life science and dual-security concerns, and she also been invited to give talks to various members of the U.S. intelligence community and to UN expert advisory groups. Thus, her work has kept close engagement between academia and policy.

### **State Department Profile**

**Under Secretary for Civilian Security, Democracy and Human Rights**

**Office to Monitor and Combat Trafficking in Persons**

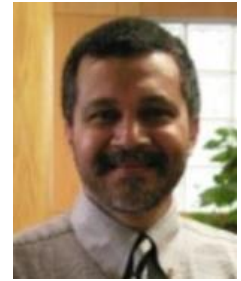
Kathleen Vogel serves as a Foreign Affairs Officer in J/TIP. She works in the Reports and Political Affairs (RPA) unit, whose primary role is to engage foreign governments regarding human trafficking issues and to prepare the annual Trafficking in Persons (TIP) Report. Vogel's portfolio in RPA includes Caribbean and East/Central European countries and she has responsibility for drafting assessments of the anti-trafficking efforts in these countries for the TIP Report. In her work, Vogel works closely with the Bureau of Intelligence and Research, and supports the various country/regional desks/embassies that relate to her portfolio. In addition, while in RPA, Vogel plans to conduct longer term, trans-national trend analysis of human trafficking issues, using big data analytics techniques and platforms, working with a variety of academic, NGO, and intelligence community partners.

# Jefferson Science Fellows 2004–2017

## # 2015 – 2016 Fellows #

### **ABUL FAZAL MOHAMMAD ANWAR**

Electrical and Computer Engineering, University of Connecticut



*Bio* - Dr. Abul Fazal Mohammad Anwar (goes by "Dr. Mehdi Anwar") currently serves as a Full Professor in the Electrical and Computer Engineering department. He earned his Ph.D. in electrical and computer engineering at Clarkson University, Potsdam, NY in 1988. He has served as the Associate Dean for Research & Graduate Education, School of Engineering, (2006 -2009), founding Director of the Department of Homeland Security Center of Excellence (2007-2009), interim Director of the Connecticut Global Fuel Cell Center (2007-2009) and interim Department Head of ECE (1999-2001). He was an IPA (July '04 – August '05) at the Sensors Directorate, Hanscom Air Force Base, working on advanced metamorphic HEMTs and GaN-based HFETs pioneering the design of low noise antimony-based-compound-semiconductor (ABCS) HEMTs. He has presented over 40 plenary and invited talks at national/international conferences, published over 240 research articles and book chapters and edited 9 volumes. Dr. Anwar serves as an Editor of IEEE JEDS and served as an Editor of the IEEE Transactions on Electron Devices (2001 – 2010); Guest Editor of Optical Engineering; conference chair of Terahertz Physics, Devices and Systems, at SPIE DSS/Sensing (2009-date). Dr. Anwar is a Fellow of SPIE.

### **MICHAEL W. HAMBURGER**

Geological Sciences, Indiana University



*Bio* - Dr. Michael W. Hamburger is a professor of Geological Sciences at Indiana University, where he has served on the faculty since 1986. He received a B.A. in Environmental Sciences and Russian Studies at Wesleyan University and M.S. and Ph.D. degrees in geophysics at Cornell University. His research interests center on the relation of earthquakes to global geological processes, earthquake hazards, and volcanic activity, including field investigations in Alaska, the Philippines, the South Pacific, Central Asia, the Caucasus, and the central U.S., notably including a current project that involves deployment of 140 seismic instruments across the Midwest. He has worked extensively with international colleagues in the former Soviet Union and the Philippines, and has technical fluency in Russian and French. He has strong interests in the intersection of natural disasters, environmental challenges, and economic and social issues. He is currently involved in a number of projects involving assessment of hazards associated with earthquakes, including those associated with oil and gas exploitation. Professor Hamburger has been a visiting researcher at the University of Nice (France), the UNAVCO Consortium, and the U.S. Geological Survey, and has served as Associate Dean and Associate Vice Provost at Indiana University. His teaching ranges from introductory-level courses on earthquakes and volcanoes to advanced courses in volcanology, seismology, and plate tectonics, as well as field courses in the Sierra Nevada and Hawaii. He has been a vocal advocate for science outreach, and has played a leading role in developing a major university sustainability initiative that links academic, operational, and residential programs related to environmental stewardship.

### **State Department Profile**

**Office of the Secretary**

**Office of Religion and Global Affairs**

Michael Hamburger serves as a Senior Advisor in the State Department's Office of Religion and Global Affairs, where he works on global environmental issues, climate change, and natural disaster mitigation. He helps connect people from U.S. government sponsored programs with domestic and international faith groups engaged in environmental advocacy and sustainable development. A particular focus is engaging faith communities around the negotiations for the U.N. Framework Convention on Climate Change COP-21 Conference in Paris. He is also collaborating on development of new programs to engage religious communities in disaster risk reduction efforts in vulnerable countries.

# Jefferson Science Fellows 2004–2017

## JILL KANALEY

Nutrition and Exercise Physiology, University of Missouri



*Bio* - Dr. Jill Kanaley is a Professor in the Department of Nutrition and Exercise Physiology at the University of Missouri since 2009. She received her PhD in Exercise Physiology from the University of Illinois, Champaign-Urbana and postdoctoral experiences at the Mayo Clinic and the University of Virginia. She then joined the faculty of the Department of Exercise Science at Syracuse University. Dr. Kanaley has provided peer review service to NIH, serves on the Editorial Board for the *Medicine in Science in Sports and Exercise*, and has served on the Board of Trustees and the programming committee for the American College of Sports Medicine. She is an exercise physiologist who studies the effects of exercise/physical activity on endocrinology and metabolism. Her research focusses on glycemic control throughout the day in obese individuals with type 2 diabetes using lifestyle interventions (diet and exercise). Her research has been supported by NIH. She is a fellow of ACSM and the Obesity Society.

### **State Department Profile**

**Office of U.S. Global Aids Coordinator**

**Office of Research and Science**

Jill Kanaley serves as a senior science advisor in S/GAC. She has been involved in following the PEPFAR Combination Prevention Trials and their impact on HIV incidence and linkage to care. In addition, she is working on projects addressing non-communicable diseases (NCD) in PEPFAR countries. One project is the PEPFAR NCD project, which is in conjunction with NIH Fogarty International Center, and the other project is with AstraZeneca. In addition to supporting her colleagues in ORS, she is assisting on the DREAMS initiative.

## DARLENE R. KETTEN

Marine Sciences and Neurophysiology, Woods Hole Oceanographic Institution



*Bio* – Dr. Darlene Ketten is a marine scientist and neurophysiologist specializing in biomechanics of hearing and hearing loss. She received a B.A., Washington University (Biology; French); M.S., Massachusetts Institute of Technology. (Biological Oceanography), and Ph.D., Johns Hopkins Medical Institutions (Neuroanatomy, Behavioural Ecology; Experimental Radiology). She currently holds joint appointments as Professor of Imaging and Applied Physics, Curtin University; Assistant Clinical Professor (PT), Otolaryngology, Harvard Medical School; and Chief Scientist, WHOI Computerized Scanning and Imaging Facility (<http://csi.who.edu>). Dr. Ketten has twenty-five years' experience in auditory physiology, noise and blast trauma, and high resolution radiology and over 100 peer reviewed publications on head and neck trauma imaging, biomechanics of hearing, and hearing loss pathology. Her research on human hearing focuses on how inner ear anatomy and pathology affect cochlear implant performance. Her marine research centers on underwater hearing and biosonar, with funding from NIH, NSF, ONR, DoD, NATO, and Seaver Foundation. She has specialty accreditation in Neuroradiology, Veterinary Pathology, and Forensic Pathology and is a Fellow and designated Subject Matter Expert in Bioacoustics (ASA), Senior Fellow of the National Institutes of Health (NIH/NIDCD), Fellow of the Association for the Advancement of Science (AAAS), and ISO working group member (Underwater Acoustics). She is a member of the Radiology Society of North America (RSNA), the European Radiology Society, Society for Marine Mammalogy, Sigma Xi, Delta Omega Honor Society, the Royal Society of Medicine (RSM/UK), and the American Military Surgeons of the United States (AMSUS). Dr. Ketten has served on international and US Federal advisory boards and as a specialty panelist and expert witness for NIH, the National Academy of Sciences, the Marine Mammal Commission, NATO, NOAA, NIH, SAACLANT, NIH/CDC on Cochlear Implants, CHABA on Blast Trauma, and EU Polar Research Policy Board, and has provided testimony and briefings for the U.S. House, U.S. Senate, and Pentagon staff.



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**State Department Profile**  
**Bureau of Near Eastern Affairs**  
**Iraq Economics Division**

Darlene Ketten serves as a science advisor for the Near Eastern Affairs Bureau, Iraq Economics Division (NEA/I/ECONN). Her principal duties are to provide insight and analyses related to Environment, Science, Technology, and Health issues within Iraq and to assist in developing educational and research opportunities for Iraqi scientists to interact with colleagues in the United States. Much of her efforts are directed at management of the critically limited Iraqi water resources, including programs for desalinization, rehabilitation of marshlands, and safe, hygienic water distribution programs. She interacts particularly with the Bureau of Oceans and International Scientific and Environmental Affairs (OSE) and with USAID, OFDA, and DART to develop humanitarian response measures.

## **GARRICK LOUIS**

Systems Engineering, Civil & Environmental Engineering, University of Virginia

*Bio* - Dr. Garrick Louis is Associate Professor of Systems Engineering, Civil & Environmental Engineering, and Engineering & Society, as well as the founding director of the Small Infrastructure and Development Center at the University of Virginia. His research explores models for building local capacity for sustained access to essential human services in rural, low-income, and other developing communities. He analyzes how this capacity can facilitate economic and broader sustainable human development. Dr. Louis' background is in the engineering of decentralized water and sanitation systems, but he collaborates with other researchers on shelter, household energy, indoor air, food, and personal security. His BSc. and MSc. degrees are in Chemical Engineering, and his PhD is in Engineering & Public Policy. He was a Warren Weaver Fellow in the Global Environment Division of the Rockefeller Foundation, received the Presidential Early Career Award for Scientists & Engineers in 2000, and was a 2006 AAAS Science & Policy Fellow at the Environmental Protection Agency. Dr. Louis has partnered with universities, local governments, and NGOs in the US, as well as Brazil, Cameroon, Guatemala, India, Indonesia, Mexico, Nepal, Nicaragua, South Africa, Trinidad & Tobago, and Zimbabwe to conduct his research on capacity building for access to basic human services. At the Rockefeller Foundation Dr. Louis helped to set up the Leadership for Environment & Development (LEAD) – Southern Africa Trust, as well as the Plant Oil Biofuel Initiative.



**State Department Profile**  
**Secretary's Office of Global Food Security**

Garrick Louis serves in the Office of the Special Representative to the Secretary for Global Food Security (S/GFS). His assignment is to explore the policy and program options for Urban Food Security (UFS) in the context of Food Loss and Waste (FLaW) and the nexus of Food, Energy, and Water (FEW). Garrick has determined that urban and rural food security are interdependent challenges, and that policies to address them effectively should be simultaneous and complementary. He has developed the conceptual approach that connects urbanization to increased food production and livelihoods in rural areas along the continuum of people and settlements between the rural and urban poles. It would use Rural Town Centers (RTCs) to deliver food and value added products from rural areas to Urban Village Centers (UVCs). In return, the UVCs facilitate the transfer of remittances and specialized services, like healthcare and vocational training, to rural areas, where they are dispensed at the RTCs. This concept is being developed in consultation with other offices within the State Department, other U.S. government agencies and international development organizations.

# Jefferson Science Fellows 2004–2017

## MARGARET MARTONOSI

Computer Science, Princeton University



*Bio* - Dr. Margaret Martonosi is the Hugh Trumbull Adams '35 Professor of Computer Science at Princeton University, where she has been on the faculty since 1994. She is also an associated faculty member in the Electrical Engineering department and the Princeton Environmental Institute. From 2005-2007, she served as an Associate Dean for Princeton's School of Engineering and Applied Science. Dr. Martonosi's research interests are in computer architecture and mobile computing, with particular focus on power-efficient systems. Her work has included the development of the Wattch power modeling tool and the Princeton ZebraNet mobile sensor network project for the design and real-world deployment of zebra tracking collars in Kenya. Her current research focuses on hardware-software interface approaches to manage heterogeneous parallelism and power-performance tradeoffs in systems ranging from smartphones to chip multiprocessors to large-scale data centers.

Dr. Martonosi is a Fellow of both IEEE and ACM. Notable awards include the 2010 Princeton University Graduate Mentoring Award, the 2013 NCWIT Undergraduate Research Mentoring Award, the 2013 Anita Borg Institute Technical Leadership Award, the 2015 Marie Pistilli Women in EDA Achievement Award, and the 2015 International Symposium on Computer Architecture Long-Term Influential Paper Award. In addition to many archival publications, Martonosi is an inventor on seven granted US patents, and has co-authored two technical reference books on power-aware computer architecture. She currently serves as an elected member of the Board of Directors of the Computing Research Association (CRA). She is an emeritus member of CRA-W, the CRA's Committee on the Status of Women, where she developed and oversaw programs to improve the representation and retention of women in computing research. Martonosi completed her Ph.D. at Stanford University, and also holds a Master's degree from Stanford and a bachelor's degree from Cornell University, all in Electrical Engineering.

### **State Department Profile**

**Bureau of Economic and Business Affairs**

**Office of International Communications and Information Policy**

**Office of Multilateral Affairs**

Margaret Martonosi serves in the Economics Bureau's Office of International Communications and Information Policy. EB/CIP is responsible for the formulation, coordination, and oversight of policy related to information and communication technology (ICT). Within CIP, Martonosi works on a range of computing-related topics, including technical and policy issues related to the Internet of Things, as well as initiatives to increase the world population's ability to effectively and affordably access the Internet. Martonosi participates frequently in U.S. inter-agency discussions including the Department of Commerce (NTIA), FCC, and others. Her work also involves engagement with multilateral organizations such as the International Telecommunications Union.

## PAMELA MCCAULEY

Industrial Engineering & Management Systems, University of Central Florida



*Bio* - Dr. Pamela McCauley is an ergonomics and biomechanics expert, a popular keynote speaker, and a professor in the Department of Industrial Engineering and Management Systems at the University of Central Florida where she leads the Human Factors in Disaster Management Research Team and serves as Director of the Ergonomics Laboratory. She previously held the position of Martin Luther King, Jr. Visiting Associate Professor of Aeronautics and Astronautics at the Massachusetts Institute of Technology. She is the author of over 80 technical papers, book chapters, conference proceedings and the internationally acclaimed ergonomics textbook, *Ergonomics: Foundational Principles, Applications and Technologies*. Many of her leadership, diversity, innovation and STEM education related talks draw from her research-based book *Transforming Your STEM Career Through Leadership and*

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Innovation: Inspiration and Strategies for Women as well as her personal story; *Winners Don't Quit . . . Today They Call Me Doctor.*

Dr. McCauley has received numerous awards in recognition of her professional accomplishments including the prestigious 2015 Black Engineer of the Year Educational Leadership Award and a 2012 Fulbright Specialist Scholar award. Her research focus includes ergonomics of disaster management, development of artificial intelligence models using fuzzy set theory and, most recently, The Critical Global Ergonomics of Treating Ebola and Other Infectious Diseases.

## **ESTHER OBONYO**

Engineering Design, Pennsylvania State University



Bio - Dr. Esther Obonyo is an Associate Professor of Engineering Design at the Pennsylvania State University. Prior to that she was an Associate Professor at the University of Florida's (UF) Rinker School of Construction Management and was also a faculty entrepreneurship Fellow at UF's Warrington College of Business. She has worked as a Construction Engineer, Project Manager and Innovations Analyst in several Engineering and Construction Companies in Kenya, the UK and the US. She holds a BA in Building Economics from University of Nairobi, MA in Architecture from University of Nottingham and a Doctor of Engineering from Loughborough University. Esther's research interest cuts across the following themes: climate change and extreme weather events, environmental sustainability, intelligent information and knowledge-based systems for productivity improvement and entrepreneurship. Dr Obonyo has had several NSF awards including an International Research Experiences for Students directed at Developing Global Scientist and Engineers. The participants in the program completed research training in Kenya and Tanzania in a project directed at: 1) Characterizing the differences in approaches to sustainable construction engineering between developed countries, such as the USA, and developing countries, such as Kenya, and define a framework for global learning; 2) Investigating the appropriateness of construction engineering approaches used by the different types of builders in developing economies using suitable assessment models; 3) Contextualizing innovative and low cost use of building materials, water and sanitation systems that are both sustainable and affordable and; 4) Demonstrating sustainable building systems that exploit cross-fertilization of ideas across the different regions in the research. In 2014, Dr Obonyo conducted a Research Tutorial Abroad through a Center for International Business Education and Research Award from UF's Center for African Studies. She is the Vice President for ASCE Global Center for Excellence in Computing and a joint coordinator for CIB TG83 eBusiness in Construction and is also one of the founding members for CIB W120: Disaster and the Built Environment.

## **USAID Profile**

**U.S. Global Development Lab |**

**Digital Development for Feed the Future**

**Center for Data, Analysis, and Research**

Esther Obonyo served as a senior science advisor on the Digital Development for Feed the Future (D2FtF) team. D2FtF is a collaboration between the USAID's Global Development Lab and the Bureau of Food Security. Dr Obonyo also worked with the Research Partnerships for Development Team under the Center for Data, Analysis, and Research on issues related to improving the generation and use of scientific research to address development challenges. Her experience in the academic sector globally brought insight and new ideas to USAID on building collaborative research between U.S. and developing country researchers, strengthening the research capacity of developing countries to enable more sustainable research partnerships, and using the scientific findings as evidence that supports policy/program change. She helped to enhance the Partnerships for Enhanced Engagement in Research (PEER) program, a USAID-funded program implemented by the U.S. National Academies of Sciences, Engineering, and Medicine to fund collaborative research being led by developing country scientists and engineers, and develop new activities that address gaps in the local research ecosystem. Dr. Obonyo also helped with the implementation of the USAID Scientific Research Policy, the first in over 20 years, which applies to all USAID



## Jefferson Science Fellows 2004–2017

Operating Units development of a new Public Access Plan for the agency, which was mandated by White House's OSTP for all federal science agencies. Esther also leveraged her research background in building materials and infrastructure development to advise the Infrastructure team at USAID on the sustainability and resilience of the built environment.

### **W. TAD PFEFFER**

Civil, Environmental and Architectural Engineering, University of Colorado at Boulder



*Bio* - Dr. W. Tad Pfeffer is a glaciologist, geophysicist, and photographer at the University of Colorado at Boulder. He is a Fellow of the University's Institute of Arctic and Alpine Research and Professor in the Department of Civil, Environmental, and Architectural Engineering. He has been a member of the University of Colorado faculty since 1988. With a background in geology, geophysics, and mathematics, Prof. Pfeffer's research has been focused on cryospheric physics, and particularly on glacier mechanics and dynamics, the dynamics of ocean-ending glaciers, and glacier contributions to sea level. He has done field research for more than 30 years in glacier regions of the world, ranging from Alaska to Antarctica and the summit of Mt. Kilimanjaro. Pfeffer also leads the long-term study of Columbia Glacier, on Alaska's South Central Coast, one the world's most extensively studied and most rapidly changing glaciers. In the past decade, Prof. Pfeffer's research focus has shifted to include global assessments of glaciers and ice sheets, their response to environmental change, and their contributions to sea level. This has also led to work on the full spectrum of natural hazards and the role of scientific research in decision-making on natural hazards. In these capacities he has served as an advisor to the United Nations Environmental Program (UNEP), the Arctic Monitoring and Assessment Program (AMAP), and was a Lead Author for Chapter 13 (Sea Level Change) in the IPCC Fifth Assessment/Working Group I. Prof. Pfeffer was also a member of the National Research Council Committee on Sea Level Rise in California, Washington, and Oregon (2010-2012). He is presently the Editor in Chief of the new Oxford Handbooks Online series in Natural Hazard Science.

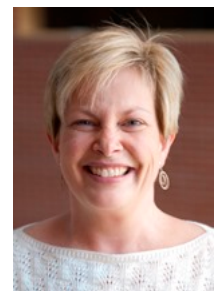
### **USAID Profile**

**Office of Economic Growth – Environment and Infrastructure  
Bureau for Europe and Eurasia**

W. Tad Pfeffer serves as a senior science advisor for water resources and climate change within USAID's E&E Bureau. His primary activity areas involve assessments and projections of future stresses and uncertainties in the water/energy nexus for the Southern Caucasus region. He collaborates with members of USAID's Global Development Lab and the Global Climate Change Initiative as well as drawing on the expertise of colleagues in academia in GRACE assessments of groundwater mass change, remote sensing of glacier volume change, and other remote sensing and modeling tools for large-scale water balance assessments and projection generally.

### **CAROLYN M. TESCHKE**

Molecular and Cell Biology, University of Connecticut



*Bio* - Dr. Carolyn M. Teschke is a Professor in the Department of Molecular and Cell Biology at the University of Connecticut, and holds a joint appointment in the Department of Chemistry. Dr. Teschke received her BS in Chemistry from the University of Wisconsin-Eau Claire. Her PhD in Biochemistry is from Washington State University and, following post-doctoral training at the Massachusetts Institute of Technology, she joined the faculty at the University of Connecticut in 1994. She has been a Visiting Professor at the Institute for Structural Biology in Grenoble, France, and at the Astbury Centre for Structural Molecular Biology at the University of Leeds, UK, where she conducted research. Dr. Teschke's research is focused on understanding the folding of viral proteins and how these proteins then assemble with high fidelity into complex structures that form viruses. She also investigates the process by which proteins essential for host cell colonization are secreted by *Mycobacterium tuberculosis*, the causative agent of tuberculosis. In her research, Dr. Teschke uses a broad array of approaches, ranging from

## Jefferson Science Fellows 2004–2017

genetics to biophysics. Her research program has been funded through the National Institutes of Health, Institute of General Medical Sciences, since 1995 and has resulted in over 45 publications. Dr. Teschke's undergraduate teaching is concentrated in biochemistry, techniques in biochemistry, and in virology. She trained many undergraduate researchers, including two University Scholars. At the graduate level, she teaches classes emphasizing modern and classic techniques of modern biology and biochemistry, and has mentored many Master's and PhD students. Dr. Teschke strives to be an excellent role model and mentor for her students, especially in encouraging young women to choose science careers. In light of this, she has served on committees whose mission was to increase diversity at the University and attended the Bryn Mawr HERS Summer Institute for leadership training for academic women.

### **State Department Profile**

#### **Bureau of East Asian and Pacific Affairs**

#### **Office of Japan Affairs**

Carolyn Teschke serves as a senior science advisor in EAP/J. Her work focuses primarily on implementation of the Global Health Security Agenda (GHSA) and other global health, science and technology issues, especially those having impacts in East Asia. As Japan is hosting the Group of Seven (G-7) ministerial meetings and Summit in 2016, she is working with State, interagency, and Japanese counterparts on integration of priority health topics into the agenda for the year. In addition, she is participating in the planning of bilateral science engagement, including serving as an expert advisor to the bureau on emerging issues in international health diplomacy such as anti-microbial resistance and the planning of new cooperative initiatives involving Japan.

### **JOHANNES W. VIEWEG**

Urology, University of Florida

Bio - Johannes W. Vieweg, MD received his medical degree from the Technical University of Munich, Germany in 1978. After relocating to the United States, he spent three years as a post-doctoral research fellow at Memorial Sloan-Kettering Cancer Center, New York, NY and Duke University, Durham, NC. In 1999, he completed the Duke residency-training program in urology and, subsequently, enjoyed a highly productive nine-year tenure as Vice Chair for Research in the Duke Department of Urology. In 2006, he joined the University of Florida (UF) as the inaugural Chairman of the Department of Urology from 2006 to 2015. Dr. Vieweg's recruitment from Duke was facilitated by the Florida Board of Governors' 21st Century World Class Scholar's program, which recognizes nationally accomplished faculty in the areas of science, technology, engineering, and mathematics. Presently, Dr. Vieweg serves as the Wayne and Marti Huizenga Endowed Research Scholar's Chair, as Director of the UF Prostate Disease Center, as Chairman of the Florida Prostate Cancer Advisory Council and as the American Urological Association's Research Council Chair. Much of Dr. Vieweg's career-long scientific activity has centered on the investigation and clinical testing of genetically engineered tumor vaccines, the discovery of universal tumor antigens and the modulation of immunosuppressive T cells and myeloid cells. He also made significant contributions to the biomedical sciences by discovering novel pathway-targeted interventions and developing prediction models for therapeutic response. More recent research interests are aligned with the field of public health, prevention medicine, implementation science and comparative effectiveness research, applied in academic and community-based settings. Dr. Vieweg's scientific work has received uninterrupted funding by the National Institute of Health since 1998 and is well documented in more than 150 publications, books, commentaries and review articles.



### **State Department Profile**

#### **Bureau of East Asian and Pacific Affairs**

Dr. Johannes Vieweg serves as a senior science and technology advisor in EAP/TC. He primarily focuses on the management and implementation of science and technology agreements established between the U.S. Department of State (DOS) and Taiwan governing authorities. Dr. Vieweg interacts with numerous DOS offices and other governmental agencies, including the U.S. Department of Health and Human Services and the National

## Jefferson Science Fellows 2004–2017

Science Foundation on issues of global health and human security. He frequently participates in meetings with U.S. and Taiwan representatives as well as with the scientific communities to advance partnerships and promote the role of science and technology in the development of foreign policy for the United States of America.

### # 2014 – 2015 Fellows #

#### **JAMES E. ALLEMAN**

Civil, Construction, and Environmental Engineering at Iowa State University



*Bio* - Dr. James E. Alleman is the Joel and Judy Cerwick Professor of Environmental Engineering with Iowa State University's Department of Civil, Construction, and Environmental Engineering. Professor Alleman obtained his BS, MS and PhD degrees in Civil and Environmental Engineering at the University of Notre Dame. Joining ISU in 2005 after completing a Fulbright Research-Scholar assignment at the Technical University of Crete in Xania, Greece, he served as a departmental Chair for six years. Dr. Alleman's additional career appointments sequentially included the U.S. Army Medical Service Corps in Okinawa, Japan (1972-1975), the University of Maryland (1978-1982), Purdue University (1982-2005), and a sabbatical Visiting Professor affiliation with the University of Leeds (1989). While at Purdue, he served as both an Assistant Head for the School of Civil Engineering and as an Associate Director for a \$10M NASA-sponsored NSCORT Advanced Life Support research center where he managed projects connected with water, air, and waste management strategies for deep-space missions. Dr. Alleman's academic and research interests are connected with environmental engineering, with emphasis on sustainable engineering systems in relation to water, wastewater, and transportation infrastructure. His current research projects include an investigation of pavement solar energy reflectance in relation to urban heat island impacts, and our nation's first full-scale study of photocatalytic concrete materials which provide air-cleaning properties. Prior research activities have involved the beneficial reuse of foundry sands, coal ash, nitrocellulose munitions, municipal and industrial sludge, cement kiln dust, and pharmaceutical residuals. He has advised 15 PhD recipients whose research outcomes were then published in 70 refereed journal papers and 30-plus conference proceedings, and he co-authored a related textbook entitled, "Environmental Biology for Engineers and Scientists." Dr. Alleman is a registered Professional Engineer in Indiana and Fellow member of the American Society of Civil Engineers.

#### **USAID Profile**

**Office of Economic Growth – Environment and Infrastructure  
Bureau of Europe and Eurasia**

Dr. Jim Alleman serves as a senior science advisor for civil, construction, and environmental project focus elements within USAID's E&E Bureau. Primary activity areas involve Ukraine's ongoing Chernobyl 'arch' sarcophagus construction and an artesian groundwater depletion challenge within Armenia's Ararat Valley. His Chernobyl project interactions included USAID representation within a Department of State construction contract review team in Kiev, and continuing review of site monitoring reports for both the 'new safe confinement' and 'interim spent fuel storage facility' construction elements. As for his contributions with Armenia's water issues, his Mission-level efforts in collaboration with USAID's Global Development Lab address both assessment and technology strategies intended to advance sustainable public and private sector water abstraction.

#### **ROBERT AXELROD**

Gerald R. Ford School of Public Policy at University of Michigan



*Bio:* Dr. Robert Axelrod is the Walgreen Professor for the Study of Human Understanding at the University of Michigan. He has appointments in the Department of Political Science and the Gerald R. Ford School of Public Policy. Prior to coming to Michigan he taught at the University of California, Berkeley (1968-74). He holds a BA in mathematics from the



## Jefferson Science Fellows 2004–2017

University of Chicago (1964), and a PhD in political science from Yale (1969). Dr. Axelrod is best known for his interdisciplinary work on the evolution of cooperation which has been cited more than 30,000 times. His current research interests include international security, including cyber conflict. Among his honors and awards are membership in the National Academy of Sciences, a five year MacArthur Prize Fellowship, the Newcomb Cleveland Prize of the American Association for the Advancement of Sciences for an outstanding contribution to science, and the National Academy of Sciences Award for Behavioral Research Relevant to the Prevention of Nuclear War. Dr. Axelrod served as President of the American Political Science Association (2006-07). Dr. Axelrod's recent publications on cyber issues include "The Timing of Cyber Conflict" (with Rumen Iliev) published in the Proceedings of the National Academic of Sciences (2014). This work has been cited in numerous technical publications and blogs from over 30 countries. Dr. Axelrod has consulted and lectured on promoting cooperation and harnessing complexity for the United Nations, the World Bank, the U.S. Department of Defense, and various organizations serving health care professionals, business leaders, and K-12 educators. He has also consulted with CyberCom on cyber analogies, and the Office of the Assistant Secretary of Defense for Networks and Information Integration on risk in networked information systems.

### **State Department Profile**

#### **Office of the Senior Advisor to the Secretary**

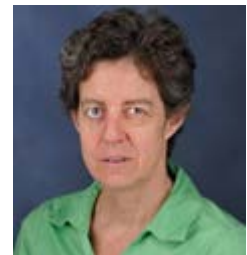
Dr. Robert Axelrod is working for Amb. David Thorne, the Senior Advisor to the Secretary of State, S/SRA. S/SRA coordinates the Secretary's Shared Prosperity Agenda (SPA) to elevate the role of economics in our foreign policy and ensure that the Department is using all the tools at its disposal to advance the U.S. commercial and economic interests around the world. Dr. Axelrod works with SRA and other stakeholders to "brand" the SPA and the U.S. approach to economic diplomacy, and craft the SPA message so that it will resonate with broad audiences. He also brings relevant new ideas from academia and industry to the attention of the State Department.

### **ALICE BEAN**

Physics and Astronomy at the University of Kansas

Bio: Dr. Alice Bean is a Professor in the Department of Physics and Astronomy at the University of Kansas. Professor Bean obtained a BA in physics and a BS in information and computer science from the Univ. of California at Irvine, an MS and a PhD in physics from Carnegie Mellon University, and was a postdoctoral researcher at the University of California at Santa Barbara, before she joined the faculty at the Univ. of Kansas in 1993.

Her research area is experimental particle physics. Dr. Bean's PhD and postdoctoral work focused on studies of the *b* and the *c* quarks. Currently, she works with the Compact Muon Solenoid collaboration at the Large Hadron Collider. In addition to studying Higgs boson decays, Dr. Bean helps to design and build detectors made of silicon. With the Do collaboration at Fermi National Accelerator Laboratory, she helped to lead the development of the innermost tracking detector. With CMS, she helped to build the outer tracking detector and currently is helping to build an upgrade to the innermost silicon pixel detector. Dr. Bean also helped to develop the radio detectors now used at the South Pole to look for ultra-high energy neutrino decays. She is a fellow of the American Physical Society.



With grants from the National Science Foundation, Dr. Bean has created research abroad activities for dozens of undergraduate and graduate students. She works extensively with undergraduate researchers at the Univ. of Kansas. Dr. Bean teaches advanced undergraduate laboratory courses as well as introductory physics courses for non-science majors. She has won the Univ. of Kansas Henry E. Gould award for distinguished service to undergraduate engineering education.

With artists and other educators at the University of Kansas, Dr. Bean created the Quarked! Adventures in the Subatomic Universe project ([www.quarked.org](http://www.quarked.org)) which seeks to create entertaining educational experiences for youth and others to learn about particle physics and other science topics. In addition to the animated videos and games available on the web, the group created hands-on workshops for elementary aged children as well as

## Jefferson Science Fellows 2004–2017

teachers. Several thousand students have taken part in these activities. Dr. Bean was awarded the 2007 Wally and Marie Steeples faculty award for Outstanding Service to the People of Kansas.

### **State Department Profile**

#### **Secretary's Bureau**

#### **Office of Faith Based Community Initiatives**

Alice Bean serves in the Office of Faith Based Community Initiatives where she works on climate change issues. She helps connect people from U.S. Government sponsored programs with domestic and international environmentally active faith groups. A particular focus is engaging faith communities around the negotiations leading to Paris in 2015 for the U.N. Framework Convention on Climate Change. She is starting a science ambassador program where international scientists visiting the U.S. connect with local faith groups to talk about climate change effects in their home country. She is also particularly interested in forging partnerships in developing and developed countries to: increase sustainable land use and farming practices, help increase the use of renewable energy technology, and studying faith practices related to water use.

### **CONCETTA C. DIRUSSO**

Department of Biochemistry at the University of Nebraska-Lincoln

Bio: Dr. Concetta C. DiRusso is a Professor of Biochemistry at the University of Nebraska-Lincoln and a Fellow of the American Association for the Advancement of Science. She obtained her BA from Hampshire College, PhD in Cell and Molecular Biology from the University of Vermont in 1982, and completed postdoctoral studies in biochemistry at the University of California, Irvine. In 1986, Dr. DiRusso joined the University of Tennessee Health Science Center where she conducted seminal work describing the mechanistic details of a fatty acid-responsive transcription factor that regulates genes required for fatty acid oxidation and biosynthesis. Following a sabbatical at Odense University, Dr. DiRusso was recruited to Albany Medical College in 1996 where she characterized one of the first eukaryotic fatty acid transport proteins. Using a series of directed mutagenesis studies, she and her colleagues localized the functional domain within this protein required for transport. This foundational work allowed Dr. DiRusso to develop a novel high throughput screening method that identified several small molecule inhibitors that reduce fatty acid transport into human cells. Professor DiRusso holds two patents for these compounds, which are now in preclinical trials. Her expertise in complex lipid metabolism is of national prominence as evidence by an uninterrupted and externally supported research program by the NIH, NSF, USDA and AHA since 1988. She has presented her work at international conferences and served on grant peer review panels for the NIH, NSF, and AHA and as an Editorial Board Member for the *Journal of Biological Chemistry*, *Endocrine Research* and *Frontiers in Fatty Acid and Lipid Physiology*. Dr. DiRusso has spent considerable effort to advance women and underserved minorities in the STEM disciplines, culminating in her work as Chair of the Faculty Committee of ADVANCE-NE, which developed best practices for recruitment, advancement and retention of tenure-track women faculty in STEM.



### **USAID Profile**

#### **Global Health Bureau**

#### **Office of HIV/AIDS (OHA)**

Dr. Concetta DiRusso serves as a senior advisor in the Office of HIV/AIDS in the PEPFAR Food & Nutrition Technical Working Group. She primarily focuses on the formulation, production and use of Ready To Use Therapeutic (RUTF) and Supplemental (RUSF) Foods. In this position she coordinates between OHA, The Bureau for Food Security (BFS) and Food For Peace (FFP) within the Bureau of Democracy, Conflict and humanitarian Assistance and Missions within USAID, as well as with interagency PEPFAR Country Teams, SAFE/PFS, ENABLE/GAIN and other technical partners supporting PEPFAR and Feed the Future Programming (e.g. FANTA-III and SPRING) to evaluate supplement formulation and to promote expanded production of RUTF and RUSF for the treatment of malnutrition. This work involves policy formulation and planning for the strengthening of regulatory control systems for the production of

## Jefferson Science Fellows 2004–2017

supplemental and therapeutic foods with governments as well as the commercial food sector and technical partners.

### THOMAS L. CRISMAN

Department of Integrative Biology at University of South Florida

*Bio:* Dr. Thomas L. Crisman is a Professor in the Department of Integrative Biology and the Department of Environmental and Occupational Health at University of South Florida in Tampa. He received his PhD in Zoology (limnology) from Indiana University and after a postdoctoral period at University of Minnesota, joined the faculty of the Department of Environmental Engineering Sciences at University of Florida, where he was professor for 30 years and Director of the Howard T. Odum Center for Wetlands. Dr. Crisman has been on the faculty of University of South Florida for 8 years. He was a Fulbright scholar in Greece and Turkey and currently serves on the boards of the US-Israel Binational Science Foundation and the Interbalkan Environment Center (Greece). Dr. Crisman's research centers on the ecology, management, restoration and conservation of freshwater wetlands, lakes and rivers globally, and he has extensive experience in Latin America, Africa, Europe and the Middle East. He currently is working on interdisciplinary approaches to ecohydrology and ecohealth, ecological impacts of urbanization, and climate change. In Costa Rica, Dr. Crisman's team is working at the watershed scale in detailed comparisons of ecological and human health indices as water management tools with the ultimate goal of integrating humans within the ecology of the area. His ecohydrological research includes the long term response of wetlands to over extraction of ground water for metropolitan Tampa, expansion of reed beds in a northern Greek lake as it has undergone profound water level reduction related to agricultural activities and transboundary management of watersheds in the Balkans. For the past seven years, Dr. Crisman has been part of a USF team conducting a series of workshops on the topic of water security in Afghanistan and Central Asia.



### STEVE GREENBAUM

Physics & Astronomy at Hunter College (CUNY)

*Bio:* Dr. Steve Greenbaum is a Professor of Physics at Hunter College of the City University of New York (CUNY) and a Fellow of the American Physical Society. He also served (2008-14) as Executive Officer of the Ph.D. Program in Physics at the CUNY Graduate Center. Dr. Greenbaum earned his Ph.D. in Experimental Condensed Matter Physics from Brown University and his undergraduate degree in physics from Clark University. He was an NRC Postdoctoral Fellow in the Semiconductor Branch of the Naval Research Laboratory in Washington, D.C., and also spent sabbatical years as a Fulbright Scholar at the Weizmann Institute of Science, and a NASA/NRC Senior Research Fellow at the Jet Propulsion Lab, California Institute of Technology. He has held Visiting Professorships in the Chemistry Department at Stony Brook University, the Materials Science and Engineering Department at Rutgers University, the School of Chemistry at Tel Aviv University, the Laboratory for Solid State Physics of the University of Paris-Sud (XI), the School of Chemical Sciences at University of Padova, and the Department of Chemistry at University of Rome, La Sapienza. Dr. Greenbaum's research involves spectroscopic studies of disordered solids by magnetic resonance and synchrotron x-ray absorption, most recently on materials for electrochemical energy storage and conversion (i.e. batteries and fuel cells). He works closely with the leading battery materials development groups at DoE and DoD national labs and at universities abroad. His laboratory develops and applies spectroscopic tools to better understand electrochemical storage and failure mechanisms at the atomic level. Dr. Greenbaum was the 2001 recipient of the Roosevelt Gold Medal for Science, bestowed by the New York Council of the United States Navy League, and the 2002 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring, awarded jointly by the National Science Foundation and the White House Office of Science and Technology Policy. He also received the 2003 Richard Nicholson Science Teaching Award.





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## **State Department Profile**

**Office of Commercial and Business Affairs**

**Bureau of Economic and Business Affairs**

Steve Greenbaum serves as senior science advisor in EB/CBA, which houses the Global Entrepreneurship Program. Among his responsibilities is coordinating a two-day pilot course for Foreign Service Officers on how to work with their host government and Department of State partners to build and foster a culture of entrepreneurship when they go back to their posts. One of Steve's other priorities is to assemble networks of U.S.-based mentors to assist inventors and entrepreneurs in the developing world, and he had an opportunity to meet many entrepreneurs at the 2014 Global Entrepreneurship Summit in Marrakech, Morocco. Steve also contributed to the formation and staffing of the technical working groups for the recently launched Poland – U.S. Innovation Program, a bilateral framework for investment in defense, health, and energy, through his scientific contacts at the Department of Defense, the National Institutes of Health, and the Department of Energy.

## **DAVID P. HAJJAR**

Weill Cornell Medical College of Cornell University



**Bio:** Dr. David P. Hajjar received his PhD in 1978 from the University of New Hampshire; after which, he became a post-doctoral fellow at both Cornell University Medical College and The Rockefeller University. In 1981, he joined the Cornell faculty, and then served as Dean of the Graduate School of Medical Sciences from 1997-2013. Dr. Hajjar is currently the Frank Rhodes Distinguished Professor of Cardiovascular Biology and Genetics and Dean Emeritus. From 2000-2013, he was appointed Executive Vice Dean and Executive Vice Provost at the Medical College. Dr. Hajjar is a distinguished, highly – funded NIH investigator who has made significant contributions to cardiovascular research, particularly in the area of arterial cholesterol trafficking. His contributions of over 170 scientific publications have earned him international recognition as a leader in the field of vascular biology. From 1995-2010, he served as the Director of the Center of Vascular Biology at Cornell's medical college. Dr. Hajjar received the Andrew Mellon Foundation Teacher-Scientist Award in 1981 and 1982; and, in 1989, became a Fellow of the Royal Society of Medicine and the American Association for the Advancement of Science. Dr. Hajjar received the Federation of American Societies of Experimental Biology (FASEB)'s Warner Lambert/Parke Davis Award in 1991 for his discoveries on the role of herpes viruses in the pathogenesis of vascular disease. In 2003, Dr. Hajjar also received the Chugai Award from FASEB which recognizes a distinguished scientist who exhibits both excellence in mentoring and education, and outstanding research achievements in experimental pathology. He has also been the recipient of several other awards from the American Chemical Society and the American Heart Association as well as honorary doctorate degrees in Science and in Humane Letters. In 2011, he received a Fulbright Scholarship and worked in the Middle East with Cornell Medical College–Qatar and Qatar University to strengthen the biomedical research and educational enterprise, and to develop science policies and opportunities for collaborations between these institutions. To continue this work, Dr. Hajjar was recently named a senior fellow in the science and public policy/diplomacy programs at the Belfer Center at the Harvard-Kennedy School of Government in 2013 to develop biomedical research polices for Middle Eastern students.

## **State Department Profile**

**Office of International Health and Biodefense**

**Bureau of Oceans, International Environmental and Scientific Affairs**

Dr. David P. Hajjar serves as senior scientific advisor in OES/IHB. He primarily focuses on the management of science and technology agreements established between the State Department and those countries in the Near East in the area of non-communicable diseases (such as cancer). David interacts with other offices within the State Department including the Office of Science and Technology Cooperation as well as the Bureau of Near Eastern Affairs. He specifically participated in diplomatic meetings as a science envoy between the State Department in Washington, D.C., the U.S. Embassies in the Near East, and scientific/medical communities abroad to advance our partnerships.

# Jefferson Science Fellows 2004–2017

## MELINDA LAITURI

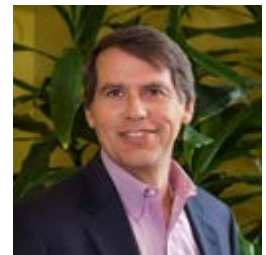
Department of Ecosystem Science and Sustainability at Colorado State University



*Bio:* Dr. Melinda Laituri received her PhD from the University of Arizona, Tucson in geography. Her dissertation research focused on environmental equity and groundwater resources in the American Southwest and the US-Mexico border. She holds a Master's degree in Hydrology and undergraduate degree in Geography. Dr. Laituri accepted a post doc at the University of Auckland, New Zealand where she then served as a lecturer in geography. She is a Fulbright Scholar and spent 2010 in Botswana working on indigenous knowledge and scientific innovation, and she conducted comparative research of major rivers as a Rachel Carson Fellow in Munich, Germany. Dr. Laituri is the Director of the Geospatial Centroid at CSU ([gis.colostate.edu](http://gis.colostate.edu)) that provides information and support for geographic information systems (GIS) activities, education, and outreach at CSU and in Colorado. She has worked with indigenous peoples throughout the world on issues related to natural resource management, disaster adaptation, and water resource issues using GIS that utilize cultural and eco-physical data in research models. A key focus is participatory GIS where indigenous peoples develop spatial information and maps essential for their management of their own resources. Dr. Laituri's other research work focuses on the role of the Internet and geospatial technologies of disaster management and cross-cultural environmental histories of river basin management.

## DAVID LODGE

Department of Biological Sciences at University of Notre Dame



*Bio:* Dr. David Lodge is the founder and Director of the University of Notre Dame Environmental Change Initiative (ND-ECI), which focuses on the interrelated problems of invasive species, land use, and climate change, and their synergistic impacts on water resources. ND-ECI provides solutions that minimize the trade-offs between human welfare and environmental health where trade-offs are unavoidable, and seeks to discover win-win solutions where they are possible. One of the world's leading experts on aquatic invasive species, Dr. Lodge has extensive research experience on a wide variety of vectors of invasive species, including ships, boats, canals, and commerce in life food, pets and plants. He and his numerous collaborators have studied Eurasian watermilfoil, rusty crayfish, zebra and quagga mussels, and Asian carp and many other species. Lodge has published more than 180 scientific papers, and has edited two books. Dr. Lodge's research focuses on ecological forecasting to better inform environmental risk assessment, policy development, and natural resource management. On numerous occasions Lodge has testified before the U.S. Congress, and has also served as an expert witness in federal court. He served as the first chair of the U.S. government's national Invasive Species Advisory Committee in 2000-01, led research on freshwater biodiversity as part of the United Nations' Millennium Ecosystem Assessment in 2000-05, and led an expert subcommittee providing advice to the U.S. Environmental Protection Agency on reducing invasions from the ballast water of ships in 2010-11. He is a member of the scientific advisory boards of NOAA and the International Joint Commission. Dr. Lodge has a long history of collaborating with economists, historians, theologians, and philosophers, and has extensive experience partnering with outside organizations such as The Nature Conservancy to help translate and transfer his scientific work to the public policy arena. As a Rhodes Scholar, Dr. Lodge received his doctoral degree from the University of Oxford, and has been on the faculty at Notre Dame for over 28 years

### **Department of State Profile**

#### **Office of Ocean and Polar Affairs**

#### **Bureau of Oceans and International Environmental and Scientific Affairs**

Dr. David Lodge serves as a Senior Science Advisor on international dimensions of invasive species policy, representing DOS on interagency groups including the National Invasive Species Council, and the Aquatic Nuisance Species Task Force. In the context of the Arctic Council's working group on Conservation of Flora and Fauna, Lodge

## Jefferson Science Fellows 2004–2017

is working to advance invasive species policies and practices during the US chairmanship of the Arctic Council. In addition, Lodge represents the US Water Partnership in the Great Lakes to Great Lakes Initiative, and collaborates with the DOS's Office of Conservation and Water to promote scientific and policy exchange between the North American and African Great Lakes.

### **DANIEL B. OERTHER**

Civil, Architectural, and Environmental Engineering  
Missouri University of Science and Technology



Bio: Dr. Daniel B. Oerther is the John A. and Susan Mathes Chair of Environmental Health Engineering at the Missouri University of Science and Technology. Previously, he was Professor and Head of the Department of Civil and Environmental Engineering at the University of Cincinnati. Dr. Oerther describes himself as a social entrepreneur using design thinking to ensure universal access to water and sanitation, to combat the obesity epidemic and malnutrition, and to eliminate extreme poverty through information technologies. Dr. Oerther originally trained in microbial genomics during his doctorate at the University of Illinois. His early career expanded the intellectual merit of using ecological theory to understand bacterial communities in suspended growth and biofilms. Multiple grants from the National Science Foundation funded research exploring the broader impacts for using microbial genomics to address sewage and drinking water treatment while translational research in bioremediation and clinical environments was supported by multiple grants from the National Institute for Environmental Health Studies. In collaboration with the US EPA and USGS, Dr. Oerther's team used cultivation independent environmental metagenomics to identify sources of fecal pollution in watersheds. From this work, Dr. Oerther is now collaborating with nutritionists to identify environmental determinants of the obesity epidemic and to improve nutrition. Leveraging Fulbright and in partnership with NGOs and community leaders, Dr. Oerther created award winning access to drinking water and sanitation for more than 100,000 villagers in India, Kenya, Tanzania, Guatemala, and Brazil. Recently, his team adapted methods from econometrics to explore multidimensional drivers of poverty including sanitation, food security, socioeconomic status, and household education. He has published groundbreaking results documenting the use of human computation to create jobs; thereby eliminating poverty in rural villages. Participants in pilot studies have used the income to purchase education for themselves and their children, and Dr. Oerther has documented that education is a primary contributor to reductions in diarrhea health burden from contaminated water supplies. The comprehensive approach developed by Dr. Oerther's research team integrates basic science, applications of engineering, translations to public health, all with the ultimate purposes of evaluating and recommending policy.

### **State Department Profile**

**Office of Global Food Security**

**Office of the Secretary**

Dr. Daniel Oerther serves as a science and technology policy advisor in S/GFS. His portfolio includes tracking agricultural biotechnology (GMOs and sustainable intensification), food loss and waste (sustainable production and consumption), nutrition (WHA 2025 targets for mothers/infants and NCDs), and the food-water-energy nexus. His geopolitical foci includes ASEAN as well as fragile and failing states in protracted crises including ISIL (NEA) and Ebola (AF) impacted regions. In addition to supporting his colleagues in the Secretary's Office in general, Daniel interacts regularly with others in the Department of State, including International Organizations (IO), Economic and Business Affairs (EB), and Oceans and International Environmental and Scientific Affairs (OES). Daniel also enjoys the opportunity of interacting with the broader interagency including serving on the external affairs team for Feed the Future as well as collaborating with USAID, USDA, MCC, USTR, USEPA, and Treasury. During his tenure, inaugural authorizing legislation for President Obama's signature development program, Feed the Future, was passed in the 113th United States Congress. Major international fora where Daniel contributed included the 41st session of the Committee on World Food Security (CFS41) of the United Nations Food and Agriculture Organization, the Second International Conference on Nutrition (ICN2) co-convened by the UN FAO and the United Nations World



## Jefferson Science Fellows 2004–2017

Health Organization, the Milan Expo 2015, as well as the Global Alliance for Climate Smart Agriculture (GACSA) and the Post 2015 Development Agenda both as part of the United Nations General Assembly (UNGA).

### **ANIL PAHWA**

Electrical and Computer Engineering at Kansas State University

*Bio:* Dr. Anil Pahwa is Logan-Fetterhoof Endowed Chair Professor of Electrical and Computer Engineering at Kansas State University and a Fellow of the Institute for Electronics and Electrical Engineering (IEEE). He received PhD from Texas A&M University in 1983, MS from University of Maine in 1979, and BE (Honors) from BITS-Pilani, India in 1975, all in electrical engineering. He served as Department Head of Electrical and Computer Engineering at Kansas State University from 2004 to 2007. Dr. Pahwa has served as officer in several IEEE Power and Energy Society committees over the past 20 years. He was Chair of Power and Energy Education Committee in 2012 and 2013, and presently he is an Editor of IEEE Transactions on Power Systems. Dr. Pahwa received the Staszeky Distribution Automation Award in 2012 and Prize Paper Award in 2013 from IEEE PES. He received Erickson Public Service Award in 2011 and Frankenhoff Outstanding Research Award in 2012 from the College of Engineering of Kansas State University. His research and teaching interests include smart grid, distribution system planning, intelligent computational methods for power systems, renewable energy, and sustainability. Dr. Pahwa has worked on several research projects sponsored by the utilities in Kansas, the National Science Foundation, and the Department of Energy. His research on power and energy has taken him to several countries including Australia, Nigeria, Kenya, South Africa, Cape Verde, and Turkey. As a faculty adviser for the student chapter of Engineers Without Borders, he has guided students on projects in India, Guatemala, and Ecuador. From 2007 to 2011, Dr. Pahwa served as the electrical engineering coordinator for a World Bank-funded project to strengthen higher education in Afghanistan. In 2007, he spent approximately three weeks at Kabul University to prepare a new curriculum, and mentor faculty and students.



### **State Department Profile**

**Office of Economic Policy**

**Bureau of East Asian and Pacific Affairs**

Anil Pahwa works in the Office of Economic Policy in the Bureau of East Asian and Pacific Affairs (EAP/EP). The EAP/EP office is the coordinator for U.S. government participation in the Asia-Pacific Economic Cooperation (APEC) forum, which is an organization of 21 economies, as well as for economic, energy, environment, and science and technology issues in the East Asian region. His work focuses on energy issues, including renewable energy and smart grid, infrastructure financing, and urbanization. Within the State Department he works most closely with the Bureau of Energy Resources (ENR). He also engages with other federal agencies including the Department of Energy and the Department of Commerce.

### **MARTIN RICHARDSON**

College of Optics & Photonics at the University of Central Florida

*Bio:* Dr. Martin Richardson is Director of the Townes Laser Institute, Professor of Optics, Physics and Electrical and Computer Engineering, a Trustee Chair, Pegasus Professor and the Northrop-Grumman Professor of X-ray Photonics at UCF. Educated at Imperial College and London University, he previously held positions at Natural Research Council-Canada and the University of Rochester. He is a world expert in the field of lasers, having spent most of his career working on high power lasers, laser-plasmas and applications of lasers. Dr. Richardson has established strong collaborations and serves on boards in many countries and has held visiting appointments in Germany, France, Japan, UK, Australia, Qatar and the former Soviet Union. A proponent of international science education, he has created several international degree programs. On joining UCF, Dr. Richardson established the Laser Plasma Laboratory specializing in the development of high power lasers, ultrafast



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lasers and their applications to laser-plasmas, X-ray and Extreme UltraViolet radiation sources, laser materials processing, and industrial, medical and defense applications of lasers. Dr. Richardson has directed several major national laser research programs including two Multidisciplinary University Research Initiative programs, has supervised ~70 MS and PhD students from many universities, has published over 430 scientific articles in professional scientific journals, and has presented numerous invited and plenary talks. He has written over a dozen book chapters and holds ~25 patents, with several pending and has chaired many international conferences including IQEC, ICHSP, and several SPIE meetings. He is a former Associate Editor of the IEEE Journal of Quantum Electronics, and serves on the Editorial Board of the LIA “Journal of Laser Applications”. He is a recipient of the Schardin Medal, awarded by the German Physical Society, the Harold E. Edgerton Award of SPIE and is a Fellow of OSA, IEEE, APS and SPIE. In December 2013 Dr. Richardson was honored with the ‘Docteur Honoris Causa’ of the University of Bordeaux in recognition of his distinguished career in lasers and photonics.

### **DR. CHARLES R. SANTERRE**

Nutrition Sciences at Purdue University



Bio: Dr. Charles R. Santerre is a Professor of Food Toxicology in the College of Health and Human Sciences at Purdue University where he also served as the Interim Head of the School of Health Sciences. His public health and toxicology research activities developed rapid assays for measuring chemical contaminants in foods, and he conducted human clinical trials to examine the clearance of chemical contaminants and the effects of diet on nutrient status. Dr. Santerre’s appointment allows him to translate scientific research into engagement programs for healthcare professionals and consumers. He has developed educational materials (including a web site, a wallet card, iPhone and Android apps) to help sensitive populations i.e., pregnant or nursing women and young children minimize their exposure to environmental pollutants in seafood while also obtaining important nutrients from these foods. His fish4health iPhone app received the 2011 Babble Award as a top 25 pregnancy app. Recently, Dr. Santerre’s wallet card was highlighted in a U.S. Center for Disease Control video highlighting its use to inform sensitive populations in Florida. In 2010, he served as an American Association for the Advancement of Science (AAAS) Science & Policy Technology Fellow and was sponsored by the USDA, Food Safety Inspection Service, Office of Public Health Science, Risk Assessment Division where he developed a vision for identifying and measuring emerging contaminants in meat, poultry, and egg products. Dr. Santerre serves as a food safety expert for the International Life Sciences Institute of North America, for the International Food Information Council, and the Food and Agriculture Organization (FAO). He holds degrees in Human Nutrition (BS), and Environmental Toxicology & Food Science (PhD), both from Michigan State University. Prior to joining Purdue University in 1998, Dr. Santerre served as an Adjunct Associate Professor in the Environmental Sciences Program at The Ohio State University and as an Assistant Professor in the Environmental Health Science Program and the Interdepartmental Toxicology Program at the University of Georgia.

## # 2013 – 2014 Fellows #

### **JONATHAN S. COLTON**

School of Mechanical Engineering at Georgia Institute of Technology



Bio - Dr. Jonathan Colton is Professor of Mechanical Engineering and of Industrial Design at the Georgia Institute of Technology. Professor Colton obtained his S.B., S.M., and Ph.D. in Mechanical Engineering at the Massachusetts Institute of Technology, prior to joining Georgia Tech’s faculty in 1985. He is a registered professional engineer in the states of Georgia and Maryland. Dr. Colton is a member of the World Health Organization’s Immunization Practices Advisory Committee and of the Board of Directors of the Global Soap Project. Professor Colton’s expertise includes humanitarian design and engineering, product design, manufacturing, and industrial design. His research has been funded by the Bill and Melinda Gates Foundation, NSF, NIH, NASA, US CDC, US Navy, NATO, GM, Ford, Boeing, Lockheed Martin, Hoechst-Celanese, Schlumberger, Kodak,

## Jefferson Science Fellows 2004–2017

and Albany International, among others. A project funded by the Bill and Melinda Gates Foundation is designing a vaccine and drug warehouse that is highly energy efficient and creates as much energy as it consumes from renewable sources. This project is in conjunction with the Tunisian Ministry of Health. Dr. Colton has designed icons for placement on UN agency-sourced vaccine vials to indicate when they should be discarded, to prevent the use of ineffective drugs. He is creating an undergraduate minor program in Global Development Studies, to allow Georgia Tech students to positively impact the world, especially developing countries. He teaches a multidisciplinary capstone design course in Humanitarian Design and Engineering in which students work on projects with sponsors from NGOs and international organizations. These projects include hand tools for refugee farmers, bio-mass gasification and solar cook stoves, equipment to make charcoal from biomass, toilets that recover resources and generate energy, net zero energy health care clinics and vaccine stores, artificial hands and arms for terror victims, vehicle design for Western African markets, and shelters for refugees fleeing conflict and natural disasters.

### USAID Profile

#### **Office of Agricultural Research and Policy Bureau of Food Security**

Jonathan Colton serves as a senior technology advisor in BFS/ARP. He works within the whole of USG Feed the Future activity, which advances food security. Dr. Colton focuses on the diffusion, adoption, and scaling of technology, particularly mechanization technology for smallholder farmers. Examples include equipment to plant and harvest, as well as to reduce post-harvest losses. He is developing methods to transfer from the research laboratory to the field, as well as to adapt technology from one field to another (health care to farming) and from one location to another (Asia to Africa). Professor Colton's efforts encompass USAID Missions in Africa, Asia, and Latin America. In addition, he works with the Office of Science and Technology (OST) to increase the interactions between USAID and the Smithsonian Institution.

### **FRED T. DAVIES**

Department of Horticultural Sciences at Texas A&M University

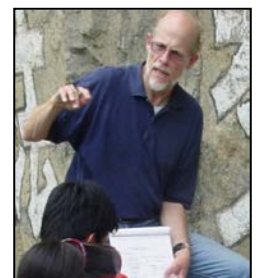
*Bio* - Dr. Fred T. Davies is a Regents Professor, Dept. of Horticultural Sciences and the interdisciplinary program of Molecular and Environmental Plant Sciences at Texas A&M University. He is also a Texas AgriLife Research Faculty Fellow. He earned a bachelor of arts and master of science degrees from Rutgers University, and a doctorate in horticulture, plant physiology and tropical agriculture from the University of Florida. He has been a Visiting Scientist at the USDA Horticultural Crops Laboratory (Oregon), CINVESTAV Plant Biology Institute (Irapuato, Mexico) and International Potato Center (CIP, Lima, Peru). Dr. Davies has also been a Visiting Professor at universities in Oregon, Mexico, Peru and Indonesia. As an expert in international horticulture and agriculture, he has been a Guggenheim Fellow and Senior Fulbright Fellow to Peru, Mexico, and most recently to Indonesia. His research has been supported by NASA, National Science Foundation, U.S. Dept. of Agriculture, other agencies, and industry. Dr. Davies has been involved with the leadership of the American Society for Horticultural Sciences, serving as international vice president, president, and chair of the board of directors. Besides numerous research and teaching awards, he is a Fellow of the American Society for Horticultural Sciences, and Fellow of the International Plant Propagators' Society, where he also served as president and is currently editor. His co-authored book on Plant Propagation is the standard text of the field, and is used worldwide by academia and industry.



### **FRANK R. ETTENSOHN**

Department of Earth & Environmental Sciences at the University of Kentucky

*Bio* - Dr. Frank R. Ettensohn is a Professor of Geology and former Chair of the Department of Earth & Environmental Sciences and former Director of the Honors Program at the University of Kentucky. He served as an officer in the U.S. Army Corps of Engineers.



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Afterwards, he received his doctoral degree in geology from the University of Illinois at Urbana-Champaign and has been at the University of Kentucky since 1975. For many years, he has directed the University's summer Geology Field Camp in the Elk Mountains of central Colorado. He was awarded Fulbright Professorships in the former Soviet Union and Nepal and has been a visiting professor in Ecuador and China. His teaching and research interests are in the broad areas of field geology, sedimentary geology and paleobiology, and he has been especially interested in the origins and characterization of black, marine, oil and gas shales. His research has been supported by NSF, DOE, the former Bureau of Mines, as well as by state agencies and oil companies. He is a fellow of the Geological Society of America and is also involved in The Paleontological Society, American Institute of Professional Geologists, American Association of Petroleum Geologists and the International Association of Sedimentologists, among others. He was recently awarded the College of Arts & Sciences Distinguished Professor Award for 2013-2014.

### State Department Profile

#### **Bureau of Energy Resources**

#### **Office of Energy Programs**

Frank Ettensohn serves as senior petroleum geologist and science advisor in ENR/EGA/EP. He follows international developments in conventional and unconventional gas for his office and does country-based assessments on the availability of unconventional gas resources, including shale gas, coalbed methane and tight sands. In addition to supporting the ENR team, he advises colleagues in State regional bureaus and other governmental agencies about the geological controls on gas occurrence, development of unconventional gas resources and energy governance. Dr. Ettensohn's main focus has been on the possibilities of worldwide shale-gas development and the resulting implications for energy security.

### **GABRIEL FILIPPELLI**

Department of Earth Sciences at Indiana University – Purdue University Indianapolis

Bio - Dr. Gabriel Filippelli is a Professor of Earth Sciences and Director of the Center for Urban Health at Indiana University – Purdue University Indianapolis (IUPUI). He received his Ph.D. in Earth Sciences in 1994 from the University of California, Santa Cruz, and his B.S. in Geology in 1986 at the University of California, Davis. Dr. Filippelli's research and teaching expertise are in the broad areas of biogeochemical cycling in the environment. His work includes research and comparative analysis of pasts climate change impacts on terrestrial and marine ecosystems, with a particular focus on how these systems respond to rapid climate change as a window into how coupled earth/human systems will respond to current and future climate change. He is also engaged with a host of public health related research projects, including assessing exposure and uptake pathways for harmful heavy metals to children in urban settings. Dr. Filippelli is considered a leader in the field of medical geology and was the first elected chair of the Geological Society of America's Geology and Health Division. His work has been funded by the NSF, NIH, EPA, and NOAA. He has served on various advisory panels for the International Ocean Drilling Program, and Chaired the program's Science Planning Committee for several years. Dr. Filippelli was a Distinguished Lecturer for the Ocean Drilling Program, and has participated in several research expeditions for the program. He has served as an editor for Marine Geology, Deep Sea Research, Geology, and currently for Applied Geochemistry. Dr. Filippelli received his school's Research Award in 2007 and the Chancellor's Award for Civic Engagement in 2013.



### State Department Profile

#### **Office of Ocean and Polar Affairs**

#### **Bureau of Oceans, International Environment & Science**

Gabriel Filippelli serves as a senior science advisor in OES/OPA. His portfolio includes issues related to marine pollution prevention, ocean resource governance, and science cooperation in the Arctic. He supports colleagues in his office and in the OES Bureau as a whole, mostly in the offices of Environmental Quality and Transboundary Affairs and International Health and Biodefense. Gabriel is part of the Urban Health working group at the Department of State. He works extensively with various US governmental agencies, including NOAA, the



## Jefferson Science Fellows 2004–2017

Department of Treasury, the USDA, and the White House Council on Environmental Quality. He also works closely with the UN Environment Program, the Arctic Council, and several Embassies, representing his office and working toward enhancing communication and using science to inform policy.

### STEPHANIE FORREST

Department of Computer Science at the University of New Mexico

*Bio* - Dr. Stephanie Forrest is Regents Distinguished Professor of Computer Science at the University of New Mexico in Albuquerque and a member of the Santa Fe Institute (SFI) External Faculty. She received M.S. and Ph.D. degrees in Computer and Communication Sciences from the University of Michigan and a B.A. from St. John's College. Before joining UNM in 1990 she worked for Teknowledge Inc. and was a Director's Fellow at the Center for Nonlinear Studies, Los Alamos National Laboratory. At UNM, she served as Dept. Chair 2006-2011, and at SFI she has served as Interim Vice President for Academic Affairs and as Co-Chair of the Science Board. She has received numerous awards, including the ACM/AAAI Allen Newell Award in 2011, the IFIP TC2 Manfred Paul Award for Excellence in Software in 2009, and the NSF Presidential Young Investigator Award in 1991. Forrest's interdisciplinary research studies adaptive systems, including biological modeling (primarily immunology, cancer, and evolutionary processes), computer security, and automatic software repair. Over the past twenty years, she has conducted numerous cybersecurity projects, each with a biological emphasis. These include: developing the first practical anomaly intrusion-detection system; designing automated responses to cyberattacks; writing an early influential paper proposing automatic diversity and introducing instruction-set randomization as a particular implementation; developing noncryptographic privacy-enhancing data representations; agent-based modeling of large-scale computational networks; and recently, work on automated repair of security vulnerabilities. She has conducted many computational modeling projects in biology, where her specialties are immunology and evolutionary diseases, such as Influenza and cancer.



State Department Profile

**Bureau of Economic Affairs**

**Office of the Coordinator for International Communications and Information Policy**

Stephanie Forrest serves as Senior Science Advisor in the Bureau of Economic Affairs, Office of the Coordinator for International Communications and Information Policy (EB/CIP). EB/CIP is led by Ambassador Daniel Sepulveda, who coordinates U.S. government policy in this arena, including financial, regulatory and Internet policy, and promotion of, and access to, information and communication technologies (ICTs) for developing countries (<http://www.state.gov/r/pa/ei/biog/bureau/209063.htm>). Dr. Forrest provides expertise and support for a wide range of Internet governance issues, including privacy, cybersecurity, cloud computing, interactions with the International Telecommunication Union and the Organization for Economic Cooperation and Development, and corresponding bi-lateral ICTs relations with East Asian countries. In this capacity, she also supports the State Department Office of the Coordinator for Cyber Issues (S/CCI) and the Bureau of Democracy and Human Rights, which is responsible for Internet freedom and access.

### SARAH A. GREEN

Department of Chemistry at Michigan Technological University

*Bio* - Dr. Sarah A. Green is Professor of Chemistry at Michigan Technological University. She holds a bachelor's degree in chemistry from the University of Minnesota after which she spent a year as an intern at the French National Centre for Scientific Research researching novel solar cell materials. She earned her PhD in marine chemistry (1992) through the Joint Program in Oceanography at the Massachusetts Institute of Technology and Woods Hole Oceanographic Institution (MIT/WHOI Joint Program). Returning to basic physical chemistry, she completed two years of postdoctoral training under Dr. Marye Anne Fox at the University of Texas, Austin. Dr. Green joined Michigan Tech



## Jefferson Science Fellows 2004–2017

University in 1994 and served as department chair from 2004 to 2013. Dr. Green's research spans scales from molecular to global across a range of disciplines linked to chemistry. She has studied the chemistry of tobacco smoke, soil carbon in forests and rivers, copper-contaminated mine waste, and novel sensors. Regionally, her work centers on the Great Lakes including the impacts of invasive species and legacy mining wastes, as well as carbon cycling, remote sensing and the effects of climate change. She served as Director of KITES, a \$4M program funded by the National Science Foundation to study coastal currents in Lake Superior. She has recently focused her energy on climate change communication and education. She has taught courses in chemistry, environmental chemistry, and green chemistry. Twelve graduate students have completed degrees under her supervision and she has served on over 50 graduate committees. At Michigan Tech, Dr. Green was a co-initiator of the Peace Corps Masters program in Science Education at Michigan Tech, and has led the Women in Science and Engineering group, directed the Earth, Planetary, and Space, Science Institute, and served as a founding member of the Great Lakes Research Center. She serves on the State of Michigan Green Chemistry Roundtable and on the governing board of the Council for Chemical Research, a national organization dedicated to enhancing collaboration among industrial, academic and government entities engaged in chemistry research.

State Department Profile  
**Office of Economic Policy**  
**East Asia Pacific Bureau**

Sarah Green served as a senior science advisor in EAP/EP. The EAP/EP office is the primary State Department coordinator for East Asia Economic Cooperation (APEC), hosted by China in 2014. Her portfolio included oceans, wildlife conservation, forestry and illegal logging, green growth, climate, and other environmental issues of importance to the 21 member economies of APEC. Within the State Department she worked most closely with the Bureau of Oceans and International Environmental and Scientific Affairs (OES). She also engaged with other federal agencies such as NOAA and EPA to advance environmental issues within APEC.

### **MICHAEL A. KRON MD, MSc, FACP**

Department of Medicine, Division of Infectious Diseases, Biotechnology and Bioengineering Center, Medical College of Wisconsin

Bio - Dr. Michael A. Kron is Professor of Infectious Diseases and a member of the Biotechnology Center at the Medical College of Wisconsin. He received his MD from the Northwestern University, his Masters in Clinical Tropical Medicine from the London School of Tropical Medicine and completed post graduate training in Geographic Medicine at Case Western Reserve University. Dr. Kron is a physician-scientist, board certified in Internal Medicine and Infectious Diseases. He was Director of the International Institute of Health at Michigan State University before moving to Milwaukee in 2005 where he founded the Global Health curriculum in the medical school. He has been active in many US NIH and World Health Organization collaborative research programs on neglected tropical diseases over the past 30 years. He has a long term association with the University of the Philippines, Manila, where he has directed basic science, primary health care, and community and economic development programs in urban and rural areas. He has a wide range of experience in tropical medicine as it exists in Liberia, the Sudan, Ecuador and the Philippines.



### **ELIZABETH MONTGOMERY COLLINS**

Section of Retrovirology & Global Health, Department of Pediatrics, Baylor College of Medicine

Bio - Dr. Elizabeth Montgomery Collins is an Associate Professor of Pediatrics in the Section of Retrovirology and Global Health at Baylor College of Medicine. As a member of the Baylor College of Medicine International Pediatric AIDS Initiative (BIPAI), and as a pediatrician, she has provided care and treatment to HIV-infected patients in Botswana, in Tanzania, and in



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Houston, Texas, at Texas Children's Hospital. She is a graduate of the University of Illinois, With Distinction, and Southern Illinois University School of Medicine, and holds a Master of Public Health degree, With Distinction, from Saint Louis University, where, in the Department of Pediatrics, she served as the director of the Medicine Abroad Program, director of the Foreign Adoption Clinic, director of pediatric volunteers and resident rotations at La Clinica Latino Community Health Center, and director of the Pediatric Advocacy and Community Education program. She has significant experience advocating for maternal-child health issues, and working with foreign Ministries of Health. She has traveled as a physician and global health expert to Malawi, Peru, Romania, Moldova, the Dominican Republic, Russia, Nepal, Haiti, Lesotho, and Swaziland. She has also lectured in Australia and completed an HIV Visiting Professorship in Haiti. She is an active Fellow in the American Academy of Pediatrics (AAP), serving as an appointed member on the Committee on Pediatric AIDS, and as a twice-elected Executive Committee member for the Section on International Child Health, where she has contributed as the Co-Chairperson of the Annual Program, Chairperson of the Development Committee, and has been charged with overseeing international child health policy. In 2013, she was selected as a Jefferson Science Fellow, and now serves at the U.S. Department of State, where she works on the Global Partnership Initiative as a Senior Science Advisor in the Secretary of State's Office.

[State Department Profile](#)

**Office of the Secretary of State**

**Global Partnership Initiative**

Dr. Elizabeth Collins served as a senior science advisor for S/GPI. She focused on forming partnerships with the private sector based on Secretary of State John F. Kerry's priorities of women's and children's health. In addition, she served as the main liaison in the office for any partnerships involving universities, education, medicine, science, and technology. Dr. Collins played an integral role in the Northern Ireland Delegation to promote science, technology, engineering, and mathematics for youth, and to promote innovation and entrepreneurship in those areas.

### **KENDALL E. NYGARD**

Department of Computer Science and Operations Research at North Dakota State University

Bio - Dr. Kendall E. Nygard is a Professor of Computer Science and Operations Research at North Dakota State University (NDSU) where he has served on the faculty since 1977. He earned a Bachelor's degree in Mathematics and Physics from Moorhead State College, a Master of Science in Mathematics from Mankato State College, and a PhD in Operations Research from Virginia Tech University. From 1996 to 2005 he served as Chair of his department at NDSU. In 1986 and 1987 Dr. Nygard was on the adjunct faculty in operations research at the Naval Postgraduate School in Monterey, California. In 1994 and 1995 he was Director of the Scientific Computing Center at the University of North Dakota in Grand Forks. In 1984 Dr. Nygard was a visiting scientist at the Air Force Logistics Command at Wright-Patterson AFB in Ohio. In 2000 he was a research fellow at the Air Vehicle Directorate of the Air Force Research Lab. He has directed International Educational Programs with several countries, especially China. Apart from his work as a scientist, he has been involved in policy making, governance, economic development, and community service through service on various boards and within organizations. Dr. Nygard's research areas involve the tools of decision-support, mathematical modeling, computational science, artificial intelligence, simulation, data mining, and social networks. Applications include management and security of communication networks and sensor networks, cooperative mission control for unmanned air vehicles (UAVs), computer-based transportation and logistics, the smart electrical grid, and social and ethical impacts of computers. He also has extensive involvement in national and international educational initiatives.



## Jefferson Science Fellows 2004–2017

### KANNAPPAN PALANIAPPAN

Department of Computer Science at the University of Missouri



*Bio* - Dr. Kannappan Palaniappan is the LaPierre Associate Professor of Computer Science at the University of Missouri. He received his PhD from the University of Illinois at Urbana-Champaign, and MS and BS degrees in Systems Design Engineering from the University of Waterloo. He directs the Center for Computational Imaging and VisAnalysis focusing on research at the synergistic intersection of image analysis, computer vision, parallel computing, information fusion and machine learning to understand, quantify and model physical processes with applications to biomedical and defense imaging. Recent multidisciplinary contributions range across orders of scale from sub-cellular microscopy at the molecular level to remote sensing imaging at the macro level. At NASA Goddard Space Flight Center, he co-founded the Visualization and Analysis Lab that has produced a number of spectacular Digital Earth visualizations used by search engines, museums, magazines, and broadcast television. He is co-inventor of the Interactive Image SpreadSheet for interactive exploration of massive multispectral imagery, and developed the first large scale parallel semi-fluid cloud motion analysis algorithm using geostationary satellite imagery for improving hurricane modeling. In the bioimaging phenomics and biomedical engineering areas his research program centers on quantitative high-throughput algorithms for characterizing cellular and sub-cellular behavior for accurate cell detection, boundary segmentation, classification and tracking algorithms with applications to cancer, stem cells, cell cycle, tissue identification, vascular networks and clinical image analysis. Active research in visual scene understanding is ongoing in wide area imaging using camera arrays, object tracking video analysis, level set-based vision algorithms, non-rigid motion analysis, activity-based video retrieval, 3D multiview reconstruction, data mining, user interfaces and scientific visualization. He is a recipient of the NSERC Canada Scholarship, University of Missouri William T. Kemper Fellowship for Teaching Excellence, Air Force Summer Faculty Fellowships, Boeing Welliver Summer Faculty Fellowship and the NASA Public Service Medal for pioneering contributions in developing scientific visualization and analytic tools for big data.

### B.L. RAMAKRISHNA

School of Engineering for Matter, Transport and Energy, Fulton Schools of Engineering, Arizona State University



*Bio* - Dr. B.L. Ramakrishna received his PhD from the Indian Institute of Technology, Madras in 1982 and joined the faculty at Arizona State University in 1985 after postdoctoral work at University of Zurich and Washington State University. The research questions that he investigated lie at the crossroads of Biology and Engineering. He studied biological supramolecular assemblies such as proteins, membranes, and DNA that are capable of incorporating inorganic solids and precisely engineer their size, shape, and orientation at the nanometer scale. The applications of the research on biosensor design and silicon-bio hybrid devices span a wide spectrum from mining, electronics, and health to defense. From 2001 to 2011 he directed the NSF-sponsored GK-12 project, whose goal was to integrate seamlessly the educational efforts at the university and secondary school levels for strengthening the pipeline to recruit highly motivated and well prepared students into STEM careers. He is dedicated to preparing engineers that not only have the necessary engineering skills but also the cross-disciplinary knowledge, entrepreneurial spirit, global perspective and a sense of mission needed to lead our country and the world to meet the great challenges facing humankind in the 21st century. From 2009-2013 the director of Arizona State University's Grand Challenge Scholars program. From 2011-2016, he was the Diane and Gary Tooker Professor of Materials Science and Engineering and he retired from ASU in 2016. In January 2017, he accepted a position at the National Academies as the Director of the Grand Challenge Scholar Program Network. His main responsibilities are to broaden and deepen the impact of the National Academy of Engineering's program across the US and around the world by forging vibrant partnerships between universities, engineering societies, industry, civil society and governments.



## Jefferson Science Fellows 2004-2017

### MO SALMAN

Department of Clinical Sciences and College of Veterinary Medicine and Biomedical, Colorado State University



*Bio* - Dr. Mo Salman is a Professor of Veterinary Epidemiology in the Department of Clinical Sciences and College of Veterinary Medicine and Biomedical at Colorado State University. He is founder and director of Colorado State University's Animal Population Health Institute. Dr. Salman's research emphasis is in veterinary epidemiology with interests in analytical veterinary epidemiology, methodology for national and international animal disease surveillance systems, observational and clinical studies on animal populations, and epidemiology of infectious diseases. He has been the principal investigator on several research projects which include: the Program for Economically Important Infectious Animal Diseases (PEIIAD), enhancement of the technical capability of the National Animal Health and Food Safety Services System in the Republics of Georgia, Armenia, Albania, Kyrgyzstan, Iraq among other countries; simulation modeling for foot and mouth disease, training in field investigation for highly pathogenic Avian Influenza, and the refinement of risk assessment methods for infectious animal diseases that have impact on trade and public health issues.

State Department Profile

**Bureau of African Affairs**

**Office of Public Diplomacy and Public Affairs**

Dr. Salman is the senior scientific advisor to the African Bureau under Public Diplomacy and Public Affairs Office. His main job duty is to support Public Affairs Officers in Africa in their mission to enhance public diplomacy activities in science and technology (S&T). It is done through initiation of programs that engage the public to improve the science environment specifically in education, accelerating technology development, and collaborating among government, universities, non-governmental organizations, and industry in the sub-Sahara region. He has been engaged in activities mainly to assess the value of S&T in enhancing the public diplomacy activities among the staff members in the US embassies in the region. He is working closely with these Embassies and African governments in specific programs to improve science education in the region, assist in the development and implantation of host government national plans on S&T, and promote science and technology research collaboration as a mechanism of diplomacy. Due to the broad aspect of his job and his specialty, Dr. Salman's focus is on agriculture and health sciences including high education as a model for other scientific disciplines.

### MICHAEL SHUR

Department of Electrical, Computer, and Systems Engineering and Physics, Applied Physics and Astronomy, Rensselaer Polytechnic Institute



*Bio* - Michael Shur received MSEE (with honors) from the St. Petersburg Electrotechnical University, and Ph.D. and Dr. Sc. Degree from A. F. Ioffe Institute. He is Patricia W. and C. Roberts Professor of Solid State Electronics and Director of NSF I/UCR Center at RPI. His recent research publications are related to electronic and photonic devices, including terahertz devices and systems and deep ultraviolet diodes for applications in medicine, agriculture, and water purification. His research on high-speed devices deals terahertz emitters and sensitive terahertz detectors for applications ranging from cancer diagnostics to ultra-high speed wireless communications. He also explores nitride semiconductors, with their enormous current carrying capabilities and high breakdown voltages, for applications in energy and communication systems. His research on smart lighting focuses on novel ways to evaluate the quality of light with applications for energy savings and custom lighting.

# Jefferson Science Fellows 2004-2017

State Department Profile

**Economic and Business Affairs Bureau**

**Global Entrepreneurship Office**

Dr. Michael Shur is working in the Department of State Global Entrepreneurship Office that has ambitious programs supporting entrepreneurship and emerging small businesses around the globe. The United States Government and Up Global will support and train 500,000 new entrepreneurs in the next three years in 1,000 cities worldwide. Dr. Shur's duties include interacting with universities and university business incubators worldwide for establishing programs promoting entrepreneurship and educating small business entrepreneurs. He is also responsible for supporting entrepreneurship programs in Latin America.

## # 2012 – 2013 Fellows #

### **DAVID R. BENSON**

Department of Molecular and Cell Biology at the University of Connecticut

Bio - Dr. David R. Benson is Professor of Microbiology and Head of the Department of Molecular and Cell Biology at the University of Connecticut. He received his doctoral degree from Rutgers University in Microbiology and Biochemistry and did postdoctoral work at the University of Wisconsin, Madison in biochemistry before coming to UConn in 1980. Dr. Benson's research and teaching expertise are in the broad areas of bacterial molecular genetics, microbial physiology and ecology. He is particularly interested in genomic and biochemical characteristics that align with the distribution of microorganisms in environments. This interest is manifested in studies on nitrogen-fixing plant symbioses, cheese ripening microbiology and tick-borne diseases. Recent work has used high-throughput DNA, RNA and protein sequence analysis to study microbe plant interactions. The NSF, USDA and EPA have provided support. He is a Fellow of the American Academy of Microbiology and was twice elected as the Chair and Councilor of the General Microbiology Division of the American Society for Microbiology and has served on the Editorial Board of the journal Applied and Environmental Microbiology. He has been elected to the Connecticut Academy of Arts and Sciences and served as visiting professor at the University of Waikato, New Zealand.



State Department Profile

**Biological Policy Staff**

**Bureau of International Security and Non-proliferation**

David Benson is serving as a science advisor in ISN/BPS particularly on issues related to microbiology, molecular biology and academic science. He is providing perspectives that complement existing expertise in technical areas related to the Biological and Toxin Warfare Convention (BWC), Dual-Use Research of Concern (DURC), including synthetic DNA and other emerging technology areas that have complex policy implications. In addition to supporting his colleagues in BPS in general, David is shepherding the Department of State's response to the Presidential Policy Directive on National Strategy for Countering Biological Threats. He has also initiated outreach efforts to raise awareness among scientists about current policy issues implicit in the BWC at an international level, and has attended several relevant conferences held by other agencies and NGOs in the DC area and nationally.

### **SURYANARAYANA CHALLAPALLI**

Materials Science and Engineering, University of Central Florida

Bio - Dr. Suryanarayana Challapalli has been a Professor of Materials Science and Engineering at the University of Central Florida in Orlando, since January 2001. He holds a B.E. (Metallurgy) from Indian Institute of Science in Bangalore and M.S. and Ph.D. degrees in Metallurgical Engineering from Banaras Hindu University in Varanasi, India, where he worked as a Professor till 1988. He then came to the Air Force Research Laboratory in Dayton, OH as a National



## Jefferson Science Fellows 2004–2017

Research Council Senior Research Associate for two years, and later worked as Associate Director of the Institute for Materials and Advanced Processes at the University of Idaho in Moscow, and as a Research Professor at the Colorado School of Mines. His expertise is in the field of nanomaterials and non-equilibrium processing of materials to develop novel and improved materials. He has authored 9 books, edited 12 conference proceedings, contributed 19 book chapters, published over 300 research papers in archival journals, and presented over 100 plenary, key-notes, and invited lectures in several international conferences. He has received numerous awards and honors including the Young Scientist Medal of the Indian National Science Academy, Pandya Silver Medal of the Indian Institute of Metals, National Metallurgists' Day Award of the Government of India, Lee-Hsun Research Award of the Chinese Academy of Sciences, and the Distinguished Alumnus Award of Banaras Hindu University. He has held Visiting Professorship positions at several universities. He is a member of the Editorial Board of several international journals and has served on NSF panels in addition to evaluating proposals submitted to overseas funding agencies. Dr. Challapalli is a Fellow of ASM International and also of the Institute for Materials, Minerals, and Mining of London, UK. He was recently listed by Thomson Reuters as one of the top 40 researchers in the field of materials science who achieved the highest citation impact scores for their papers published since January 2000.

### State Department Profile

#### **Office of Iraq Economic and Assistance Affairs Bureau of Near Eastern Affairs**

Dr. Suryanarayana Challapalli is working in the Office of Near-Eastern Affairs (NEA) – Office of Iraq Economic and Assistance Affairs, where he focuses on developing science and technology cooperation between the U.S. and Iraqi scientists. He has been instrumental in identifying priority research areas for Iraq, encouraging U.S. and Iraq university cooperative efforts in the field of science and technology, and establishing a science and technology funding agency in Iraq. He is also responsible for creating, supporting, and expanding professional organizations in Iraq by linking them with U.S.-based scientific organizations. He has interacted extensively with Iraqi governmental units in Washington, DC, Iraqi scientific diaspora in the U.S., and visiting Iraqi governmental delegations in reaching these goals. Dr. Challapalli has travelled to Iraq to participate in meetings with officials from the Ministry of Higher Education and Scientific Research and Ministry of Science and Technology and also University administrators and faculty members to formalize some of the collaborative programs. He had also worked on accreditation of engineering programs in Iraq and in identifying projects and grant opportunities for bilateral cooperation. He has been most actively involved in encouraging Iraqi scientists to submit research proposals to the PEER program.

### **M. SAMY EL-SHALL**

Chemistry and Chemical Engineering, Virginia Commonwealth University

Bio - Dr. Samy El-Shall is a Professor of Chemistry and Chemical Engineering at Virginia Commonwealth University (VCU). He received his B.S. and M.S. degrees from Cairo University, and a Ph.D. in Physical Chemistry with Distinction from Georgetown University. He did postdoctoral research in nucleation and clusters at the University of California, Los Angeles (UCLA). His research interests are in the general areas of molecular clusters, nucleation phenomena, gas phase polymerization, nanostructured materials, graphene and nanocatalysis. His current research is focused on the development of new nanostructured catalysts and novel catalytic processes for energy and environmental applications. He has published over 200 refereed papers and review chapters, and he holds eight US patents on the synthesis of nanomaterials, nanoalloys, nanoparticle catalysts, graphene, and graphene-supported catalysts. Dr. El-Shall received the Exxon Education Award in 1994 and 1995; the Outstanding Faculty Award of the State Council of Higher Education of Virginia (SCHEV), Virginia's highest faculty honor in 1999; Jabir Ibn Hyyan Award from the Saudi Chemical Society for Advances in Nanomaterials & Nanotechnology in 2007; the Distinguished Research Award from the Virginia Section of the American Chemical Society in 2009; the Innovative Research Award from the Society of Automotive Engineering (SAE) in 2009; and the VCU Distinguished Scholarship Award in 2011. Dr. El-Shall served on the US National Committee for the International Union of Pure and Applied Chemistry (USNC/IUPAC) and the Editorial Boards of the Journal of Physical Chemistry, the International Journal of Photoenergy, the Open Physical Chemistry Journal,



## Jefferson Science Fellows 2004–2017

Metals, and the Annual Review of Graphene. He was the Chair of the “International Conference on Nanoparticles” in Davos, Switzerland, 2004. He chaired three US–Egypt Workshops on “Advanced Materials, 2000”, Laser Chemistry and Applications to Materials, 2004”, and “Nanomaterials and Nanotechnology, 2005”. He also chaired the NSF Advanced Studies Institute (NSF-ASI) on “Nanocatalysis for Energy and Environmental Applications” in 2010. Dr. El-Shall’s research has been supported by the National Science Foundation, NASA, DoD, NIST, Petroleum Research Fund, Dreyfus Foundation, Jeffress Memorial Trust, Exxon, Dow Corning, Philip Morris, Afton Chemical, and private organizations.

### USAID Profile

#### **Middle East Regional Cooperation (MERC) Program Bureau for the Middle East**

Samy El-Shall serves as a senior science advisor in the Bureau for the Middle East, Middle East Regional Cooperation (MERC) Program. The program promotes cooperation between Arab and Israeli technical communities through joint Arab-Israeli research projects to solve common development problems. Samy is focusing on enhancing and expanding joint Arab-Israeli research activities through rigorous peer-reviewed projects and building technical capacity in Arab countries by providing training and equipment through the MERC projects. He conducted site project reviews in Israel, Jordan and Egypt to improve collaborative research opportunities across borders and enhance implementation of research results. He is also working on creating new initiatives for young investigators in order to catalyze the next generation of Arab-Israeli research cooperation. This will contribute to development and improving the quality of life in the region, and is also expected to create long-term sustainable collaborations between Arab and Israeli scientists.

### **MAUREEN M. GOODENOW**

Pathology, Immunology, and Laboratory Medicine, University of Florida



Bio - Dr. Maureen M. Goodenow is Professor of Pathology, Immunology, and Laboratory Medicine, holds the Stephany W. Holloway University Endowed Chair for AIDS Research at the University of Florida, and is the Director of the Florida Center for AIDS Research. She received her Ph.D. in molecular genetics from the Sue Golding Graduate School at the Albert Einstein College of Medicine in New York. Following a postdoctoral fellowship in molecular oncology at the Sloan Kettering Institute in New York, she was a visiting scientist at the Pasteur Institute in Paris, where she initiated her studies of HIV. Dr. Goodenow has a research program in molecular epidemiology, pathogenesis, and vaccines for HIV-1 and related viruses, including viruses that cause cancer. Her research program, which has a track record of more than twenty years of extramural research funding from NIH and foundations, currently involves high-throughput next generation genomics, bioinformatics and systems biology applied to human immunity and pathogen interactions from a global health perspective. Dr. Goodenow has published over 100 articles and book chapters, and trained more than 25 doctoral and postdoctoral fellows. She is on the editorial boards for the Society for Leukocyte Biology, the American Society for Microbiology, and the International AIDS Society, has served as a special advisor to the Vice Chancellor of Research for the City University of New York, and is a member of National Institutes of Health committees, including the AIDS Research Advisory Committee for the Division of AIDS in the National Institute of Allergy and Infectious Diseases, and the Trans-NIH Plan for HIV-Related Research in the Office of AIDS Research. She has provided advice to the combined program between NIH and Department of State for enhancing research between US and Russian scientists, as well as Fogarty Programs in India and Kazakhstan.

### State Department Profile

#### **Bureau of East Asian and Pacific Affairs Office of Economic Policy**

Dr. Maureen Goodenow serves as the Senior Science Advisor in Bureau of East Asian and Pacific Affairs in the Office of Economic Policy [EAP/EP] for projects related to global health, science, technology, and innovation for the Asia Pacific Economic Cooperation [APEC]. Dr. Goodenow is serving as Chair for the Planning Group for the Life Sciences



## Jefferson Science Fellows 2004–2017

Innovative Forum [LSIF] and working with Indonesia as 2013 APEC host economy for a high level dialogue of APEC Health and Finance officials. Dr. Goodenow advises LSIF and the Health Working Group on issues related to cancer, mental health, health-care associated infections, and HIV/AIDS in the region, the Policy Partnership for Science, Technology, and Innovation, and committees for women's role in the economy and for travel facilitation in the APEC region for U.S. business and higher education mobility. She is guiding international groups of experts, who represent divergent perspectives and interests, as well as US Government interagency, academic, and private sector groups, in development of policy statements for APEC leaders will set the framework for projects in the APEC region.

### **SARA HARKNESS**

Center for the Study of Culture, Health, and Human Development, University of Connecticut



*Bio* - Dr. Sara Harkness is a professor of human development, pediatrics, and public health at the University of Connecticut, where she also serves as director of the Center for the Study of Culture, Health, and Human Development. She earned a B.A. magna cum laude and with high honors in Comparative Literature from Brown University, and a Ph.D. in Social Anthropology from Harvard University; subsequently, she was an NIMH post-doctoral fellow in psychology at Harvard, and earned a Master of Public Health degree from the Harvard School of Public Health. Her research focuses on how the culturally structured environments of children and families, in interaction with biological factors, shape children's health and development; major projects include a three-year study of child development and family life in a rural Kipsigis community of Kenya, an international collaborative study of parents, children and schools in seven Western countries, and a study of parenting and the development of self-regulation and reactivity among infants in four countries. She has been editor of *Ethos* (the journal of the Society for Psychological Anthropology) and is on the editorial boards of the *International Journal of Behavioral Development and Child Studies in Diverse Contexts*, as well as being editor of the *Temperament Newsletter*. In 2009, she received (jointly with Charles Super) an award from the Society for Research in Child Development for Distinguished Contributions to Cultural and Contextual Factors in Child Development. In addition to her cross-cultural research, she has also been involved with intervention programs to help disadvantaged families and youth in Connecticut, and has served on review panels for NICHD, the Maternal and Child Health Bureau, and the Agency for Health Research and Quality.

#### USAID Profile

##### **Latin American and Caribbean Bureau**

Sara Harkness is a Senior Advisor to the Health and Education teams in the Latin American and Caribbean Bureau (LAC) at USAID, where she has participated in planning for a regional summit meeting on Child Survival in the Americas, and has worked with colleagues on the development and oversight of projects to promote early grade reading, especially for indigenous areas in Guatemala and Peru. She has given several seminars at USAID on applying cultural perspectives to interventions for child health and development, and is writing a review of research on "best practices" to promote early grade reading. In addition to her work with the LAC bureau, Sara has also worked with colleagues in Global Health, where she has contributed to an "evidence summit" on population-level behavior change, and in the Education Sector, where she is involved in planning a state-of-the-art workshop for USAID Education officers based in missions worldwide as well as in Washington DC. Sara has also served on a USAID committee to renew research policies within the organization. Sara's work has taken her to Guatemala for a site visit to the education project, as well as to a conference on educational interventions, held in Uganda.

## Jefferson Science Fellows 2004–2017

### **RAJ KHOSLA**

Department of Soil and Crop Sciences, Colorado State University



*Bio* - Dr. Raj Khosla is a Professor of Precision Agriculture at Colorado State University. In 2009, he was named the Colorado State University distinguished Monfort Professor. In addition, Dr. Khosla is an “Adjunct Scientist/Visiting Professor” at the National Engineering Research Center for Information Technology in Agriculture (NERCITA), in Beijing, China. In 2011, Dr. Khosla was appointed by NASA to the US “Presidential Advisory Committee on Positioning, Navigation and Timing” to work on US Space based PNT policy. Dr. Khosla’s main research focus has been on “Management of in-field soil and crop spatial variability using innovative technologies (such as Global Positioning Systems or GPS, Geographic Information Systems or GIS, and Remote-sensing) for enhancing efficiency, productivity, profitability, and sustainability of large and small scale agricultural production systems. He has co-authored over 275 publications (book chapters, refereed journal articles, extension articles, proceedings, bulletins, reports, popular press articles and others). In addition, he has been invited to deliver Keynote addresses and invited lectures at national and international conferences in numerous countries around the world. Dr. Khosla has been recognized with several national and international awards, including the 2012 Soil Science Applied Research Award. He is a Fellow of American Society of Agronomy; Fellow of Soil Science Society of America and Fellow of Soil & Water Conservation Society. He is the current President of International Society of Precision Agriculture.

State Department Profile

**Office of Economic Policy**

**Bureau of East Asia Pacific Affairs**

Dr. Khosla serves as the Senior Science Advisor in the Bureau of East Asia Pacific Affairs, Office of Economic Policy where he is the Lead US government (USG) representative on the Policy Partnership on Food Security (PPFS) for the Asia-Pacific Economic Cooperation (APEC). In that capacity he represents US at the formal APEC PPFS meetings and engages in discussion among 21 APEC economies. Dr. Khosla is co-leading PPFS Working Group 1 as US Co-Chair along with Japan and Russia, where he is engaged in development of a long term strategic plan called “Roadmap towards 2020” to establish a secure food system within APEC. In addition, he works on a portfolio of issues including food safety, agricultural biotechnology, environment and sustainability issues, forestry and illegal logging, oceans and fisheries, etc.

### **ROGER KJELGREN**

Plants, Soils and Climate, Utah State University



*Bio* - Dr. Roger Kjelgren is a tree physiologist spanning urban horticulture, forestry, and agriculture. After undergraduate and master’s degrees in soil science from Washington and Oregon state universities, he completed his Ph.D. at the University of Washington in forestry, worked at Southern Illinois University for several years before joining Utah State University. His assignment at Utah State University has revolved around teaching and research regarding efficient water management for a range of plant types and situations, primarily for irrigated urban landscapes. From this evolved a cross-disciplinary effort developing quantitative GIS tools for urban water agencies to mine their data for capacity to conserve. From a supply angle, he coordinates a cross-disciplinary dendrochronology team to reconstruct paleo hydroclimate in the interior West with a focus on delineating rhythmic wet/dry cycles that interact with downscaled climate change scenarios. Professor Kjelgren served a Fulbright fellowship in Thailand that led to developing academic relationships with partner Thai and Chinese universities, promoting study abroad opportunities for undergraduate students in agriculture and natural resources, and collaborative research efforts.

# Jefferson Science Fellows 2004–2017

State Department Profile

**Office of Economic Analysis**

**Bureau of Intelligence and Research**

Roger Kjelgren participates as science advisor in the State Department Bureau of Intelligence and Research office of Economic Affairs. In that capacity he engages in free trade discussions with his colleagues and writings on how climate volatility impacts on agricultural and natural resource issues interact with economic factors in developing countries. This focus includes exploring common interests with other bureaus in State Department and the Agency for International Development.

## **CLYDE MARTIN**

Department of Mathematics and Statistics, Texas Tech University

Bio - Dr. Clyde Martin received his PhD from the University of Wyoming in 1971 and worked as a National Research Council Research Associate at NASA from 1971-1973. Clyde F. Martin's research interests include control theory and the development and analysis of mathematical and statistical models in agriculture, the environment and medicine. He has collaborated with engineers and scientists in a number of areas including aeronautics, bioengineering, economics, plant science, soil physics, epidemiology and chemical engineering on a variety of scientific topics. In 1983 he was appointed the Ex-Students Association Distinguished Visiting Professor of Mathematics at Texas Tech University; in 1988 he was appointed as the Ex-Students Association Distinguished Professor of Mathematics and in 1991 was appointed as a Paul Whitfield Horn Professor. He is a Fellow of the Institute of Electrical and Electronic Engineers, a Fellow of the American Statistics Association and an elected member of the International Statistics Institute. In November of 2001 he received an honorary doctorate for his work in engineering from the Royal Institute of Technology in Stockholm Sweden. He has received distinguished alumni awards from both Emporia State University and the University of Wyoming. He has directed more than 100 students to advanced degrees and has published more than 400 papers in a variety of disciplines.



State Department Profile

**Office of Global Food Security**

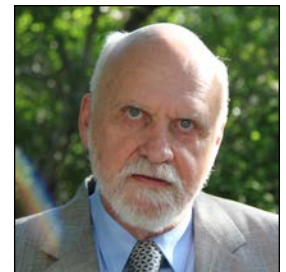
**Office of the Secretary**

Clyde Martin is serving as a science advisor to S/GFS. His main area of focus is science and technology and research and development as they relate to food and nutrition security, especially within the U.S. global hunger and food security initiative, Feed the Future, and the G-8 New Alliance for Food Security and Nutrition. Related to this portfolio but under the auspices of his position at Texas Tech University, Dr. Martin has recently made an in-depth study of indexed insurance and other micro financing issues and their mitigating effects on drought and other natural events that affect the welfare of subsistence farmers, particularly in Africa.

## **RICHARD MATZNER**

Department of Physics, The University of Texas at Austin

Bio - Dr. Richard Matzner is Director of the Center for Relativity and Professor of Physics at The University of Texas at Austin. He has spent his career educating students in cosmology, relativity, and astrophysics and consistently fosters broadened participation in and social awareness of science through his many and diverse outreach activities. These include his participation on scientific editorial boards, his decade-long tenure as Southwest Region Lead Judge for the Siemens/Westinghouse Science Competition, and his role co-directing international summer schools on Relativistic Astrophysics in Erice, Italy. Professor Matzner has extensive international experience. He concluded his graduate education with a year at Cambridge, UK and has since spent a sabbatical year and several summers at the Astrophysics department in Oxford. He has been a long-term visitor at



## Jefferson Science Fellows 2004–2017

Institutes in Britain, France, Germany (he was a long-term member of the external advisory committee to the Max Planck Institute for Gravitational Physics in Potsdam Germany), Turkey and Italy. His engagement with the Italian scientific community is extensive and long-standing. Professor Matzner is a foreign member of the Academy of Sciences of Turin and has an ongoing collaboration with the Aerospace Engineering Department of the University of Rome on laser ranged satellites. This collaboration recently viewed the launch of its satellite LARES on 13 February 2012. He has lectured extensively on Relativistic Astrophysics at The University of Lecce in Italy. Dr. Matzner has traveled extensively professionally and privately in the Americas, in Europe, Africa and Australia, and in Asia, in many cases to work with his (40+), former PhD students and postdocs and a broad community of scientific collaborators worldwide; friends, but also part of a real community tied together by mutual interests.

### State Department Profile

#### **Regional and Security Policy Office East Asia and Pacific (EAP) Bureau**

Professor Matzner is Senior Science Advisor in the Regional and Security Policy Office of the East Asia and Pacific (EAP) Bureau. He advises the Department of State on subjects including Space and Cyber questions, Health, Environmental and Climate Change and its effect on the oceans, topics relating to Energy and to Scarce Material resources, on Innovation, and on Commercialization of academic research. He has contributed to and participated in meetings on space security in Vietnam and Malaysia, and on joint scientific commission meetings with Malaysia and Australia.

### **BROOK MILLIGAN**

Conservation Genomics Laboratory, New Mexico State University

Bio - Dr. Brook Milligan is Director of the Conservation Genomics Laboratory and Professor of Biology at New Mexico State University. After earning a B.A. in physics from Dartmouth College and a Ph.D. in ecology from the University of California, Davis, Dr. Milligan worked at the University of Michigan as an N.S.F. Postdoctoral Fellow in Plant Biology. Subsequently, he has held academic positions at the University of Texas at Austin and New Mexico State University. Throughout his career, Dr. Milligan has focused his attention on the interface between population genetics and ecology/evolution, applying skills ranging from mathematical modeling to molecular genetics to field demography. Of particular interest is the challenge of extracting useful information about natural populations from patterns of genetic variation. This requires overcoming the limitation that there is little genetic information available for most natural populations, resulting in methodological, quantitative and mathematical challenges. Dr. Milligan's recent work in genomics focuses on harnessing biomedical and other innovative technologies to achieve rapid and inexpensive processing of genomes. This allows analysis of both a larger number of samples and of a larger proportion of each sample. This expansion provides a far more robust basis for identifying distinctive genetic markers for certain species or populations. These markers drive the development of practical applications to track specimens for conservation and management, and for enforcement of policies for particular species or populations. Currently, Dr. Milligan is collaborating with the U.S. Forest Service, the Department of State and USAID to apply genetics technology to tracking the origin of legally and illegally sourced timber products. In connection with this, Dr. Milligan has represented the United States at an international meeting on timber tracking technologies.



### State Department Profile

#### **Bureau of Oceans and International Environmental and Scientific Affairs Office of Conservation and Water**

Brook Milligan is serving as a Jefferson Science Fellow in the Office of Conservation and Water, a unit that oversees and promotes U.S. foreign policy objectives related to conservation and sustainable use of natural ecosystems, biological diversity and water, working through both bilateral relationships and multilateral conventions and institutions at global and regional levels. Brook is contributing his expertise to a variety of interagency committees



## Jefferson Science Fellows 2004–2017

charged with implementing international trade laws and agreements governing rare and endangered species. In this capacity he participated in a delegation led by the U.S. Trade Representative to Peru regarding forest sector compliance with the requirements of the Peru Trade Promotion Act. As part of a strong and collaborative interagency group developing technologies to reduce illegal logging and deforestation, Brook is helping the State Department, USAID, the U.S. Forest Service International Programs, and the Department of Justice design projects to improve the tracking and identification of timber. Finally, Brook is shepherding an effort to enable emerging genomics technologies to be applied as tools combating conservation crime (e.g., wildlife trafficking, illegal logging, and IUU fishing). To this end he has initiated outreach efforts to the interagency, to international conservation and civil society organizations, to foreign governments, and to the private sector in order to establish the coalitions and trust required to advance conservation genomics as a practical tool. Throughout both these efforts and his strong support of colleagues in the office, Brook has bridged the technical intricacies of science with the sensitivities of international policy negotiation to ensure that policy and strategic decisions are well-informed.

### JEAN BEAGLE RISTAINO

Department of Plant Pathology, North Carolina State University

Bio - Dr. Jean Beagle Ristaino is a William Neal Reynolds Professor of Plant Pathology at North Carolina State University. She earned her B.Sc. degree in Biological Sciences and an M.S. degree in Plant Pathology from the University of Maryland, and a Ph.D. in Plant Pathology from the University of California-Davis. Much of her research work has been on the genus *Phytophthora*, an Oomycete plant pathogen that caused the Irish potato famine.

She conducts research internationally on late blight, a threat to food security. She has used genetic markers to study migration and characterize historic and present day populations of *P. infestans*. Her research has culminated in publications in *Nature*, *Proceedings of the National Academy of Sciences*, and *Science*. She mentors graduate students, teaches a class in Tropical Plant Pathology, is the director of the Global Plant Health internship program at NC State and leads USAID funded workshops in pathogen diagnostics in Central America. She has served in numerous leadership roles at the university including the faculty senate and the administrative board of the graduate school and nationally with the USDA, NSF and USAID. She has also communicated findings of her research with the media including CNN, Discovery Channel, radio and numerous newspaper articles. Dr. Ristaino's research has not only impacted the understanding and direction of emerging pathogens and food security, but has also influenced how the general public views science and scientists.



### USAID Profile

#### **Office of Agricultural Research and Policy Bureau for Food Security**

Jean Ristaino serves as a senior science advisor in the Bureau of Food Security, Office of Agriculture Research and Policy (BFS/ARP). She works on a portfolio of issues including human and institutional capacity development in Feed the Future countries. She helped launch the Borlaug Higher Education Agriculture Research Development Program and conducted a country-wide needs assessment of agricultural research capacity in Bangladesh. She works with the Association of Public and Land Grant Universities (APLU) and the Board for International Food and Agricultural Development (BIFAD) on human and institutional capacity development and implementation of BIFADS's review of the Cooperative Research Support Program (CRSP). She conducted an analysis of the plant disease research portfolio in BFS/ARP and worked with NSF and USDA NIFA to partner and leverage their existing research portfolio's with that of USAID's. She organized a meeting on ecosystem services and emerging plant diseases in Africa and developed a network of US research scientists to serve as mentors for the African Women in Agriculture Research and Development Program.

## Jefferson Science Fellows 2004–2017

### RAJAN SEN

College of Engineering, University of Florida



*Bio* - Dr. Rajan Sen is Professor of Structural Engineering at USF where he held the inaugural Samuel & Julia Flom Chair and joint appointments at the schools of Engineering and Architecture. Born in Cambridge UK, he attended Indian Institute of Technology, University of British Columbia and is a PhD from SUNY Buffalo. He started his career at Department of Transport, London where he worked extensively in developing design software and British Bridge Code BS 5400, complemented by experience at Freeman Fox & Partners. Dr. Sen's research focuses on developing cost effective solutions for solving infrastructure problems using fiber reinforced polymers (FRP), promoting their implementation through field studies and advancing design concepts which led notably to the construction of Florida's first post-tensioned voided slab bridge in Miami. Pioneering contributions are on the durability of FRP, its application in strengthening steel and underwater repair of corroding piles. Research was funded by FDOT, NSF, TRB, the US Army Corps of Engineers, featured in Steel Bridge News and Composites Technology, and at plenary presentations at IIT and the Masonry Society. Dr. Sen has authored over 200 journal papers, book chapters, conference proceedings, technical reports, edited two books and holds a US patent on underwater repair. He has chaired international conferences sponsored by ACI and ASCE, made research presentations worldwide, served as NSF sponsored delegate to Europe, Japan and India, an invited speaker to the Caribbean hosted by the US Southern Command, and as USF visiting delegate to South Africa. Dr. Sen is a licensed professional engineer and has mentored USF students to national championships at PCI sponsored events. He is Fellow of ACI and ASCE, on the Editorial Board of ASCE's Journal of Composites for Construction, and invited guest editor at International Journal of Materials & Product Technology. He serves on FRP committees at ACI, TRB, RILEM, and on the International Advisory Board, FRP Institute India.

#### State Department Profile

#### **Bureau of International Organization Affairs Office of Global Systems**

Prof. Rajan Sen was a science & technology advisor at the Bureau of International Organization Affairs, Office of Global Systems (IO/GS). His portfolio incorporated projects from multiple agencies: disaster risk reduction (IO/HS); urban resilience, international codes, monitoring exploitation of land resources (IO/GS); curriculum development (OAS); Himalayan glacial lake over burst flooding (SAT/OES). He served on the National Science & Technology Council's subcommittees on Infrastructure (ISC) and Disaster Reduction (SDR) and its International Working Group (IWG) facilitating international cooperation in science and technology relating to all aspects of natural disasters. He contributed to the current Presidential Policy Directive consultative process document and to ISC's ongoing research agenda with a presentation on the use of emerging technologies and design to enhance infrastructure resilience. He was a member of an inter-agency Science Coordination Group for the Presidential Sandy Task Force providing recommendations on hurricane rebuilding efforts. As U.S. delegate to UNISDR he attended the Global Platform on Disaster Risk Reduction at UN Geneva. He consulted with UN-Habitat officials and UNDP officials at UN headquarters in Nairobi and New York. In both instances he gave presentations on sustainable cities- at the U.S. Embassy Nairobi and at UNDP offices in New York. He was also invited presenter at international conferences on advanced composites in Mumbai (CONMAT) and Jabalpur (ICEMT) - site of India's first FRP bridge.

### # 2011 – 2012 Fellows #

### NORMA M. ALLEWELL

College of Chemical and Life Sciences, University of Maryland

*Bio* - Dr. Norma M. Allewell is Professor of Cell Biology and Molecular Genetics and Professor of Chemistry and Biochemistry at the University of Maryland, where she served as Interim Vice President for Research and Dean of the College of Chemical and Life Sciences for a decade. She



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has also held faculty positions at the University of Minnesota, where she was a department head and vice provost; Wesleyan University, where she was founding chair of a department; and the Polytechnic Institute of Brooklyn. She was an instructor in summer courses at the Woods Hole Marine Biological Laboratory. Dr. Allewell holds a B.Sc. (Hon.) from McMaster University and a Ph.D. in molecular biophysics from Yale University. Her research focuses on protein structure, function, and dynamics; and metabolic regulatory mechanisms and diseases. She is a Past President of the Biophysical Society and a former U.S. representative to the International Union of Pure and Applied Biophysics. She was a member of a delegation from the University of Maryland to Peking University and served on a review committee for the Institute of Molecular Biology of Academia Sinica in Taiwan. She is an Associate Editor of the *Journal of Biological Chemistry* and has served on the National Academy's Committee on Space Biology and Medicine; the Board of Scientific Advisors for the National Center for Biotechnology Information; and the Advisory Committee, Directorate of Biological Sciences, National Science Foundation, as well as numerous review panels for the National Institutes of Health, National Science Foundation, and Howard Hughes Medical Institute. She is series editor for the *Biophysics for the Life Sciences* series, published by Springer.

### State Department Profile

#### **Office of Regional and Security Policy Bureau of East Asian and Pacific Affairs**

Norma Allewell was a Senior Science and Technology Advisor in the Office of Regional and Security Policy in the Bureau of East Asian and Pacific Affairs in the State Department. In this role, she was involved at some level in all activities and issues in science and technology in the Bureau and worked closely with all of the desks in the Bureau. Within DoS, Dr. Allewell was EAP's liaison to Bureau of Oceans and International Scientific and Environmental Affairs (OES), and also had frequent interactions with other bureaus, particularly the Bureau of Economic and Business Affairs (EB) and the Bureau of International Security and Nonproliferation (ISN). She also liaised with numerous federal agencies and organizations, including HHS, various branches of the DoD, DoE, EPA, NASA, NSF, NOAA, OSTP, and USAID. She was engaged in preparing briefing papers for DoS leadership, and reviewing bilateral and multilateral agreements that involve science and technology. She initiated and maintained a biweekly East Asia and Pacific Science and Technology Newsletter based on unclassified cables and other sources that has broad circulation within the Bureau. Dr. Allewell worked on specific projects in several different areas, including bioengagement and biosecurity, biodiversity, climate change and adaptation, cybersecurity, marine debris, and nuclear security, Dr. Allewell also took advantage of the opportunity to attend several relevant programs and presentations offered by the State Department and NGOs.

### **ROBERT L. BALSTER**

Institute for Drug and Alcohol Studies, Virginia Commonwealth University

Bio - Dr. Balster received his PhD in Psychology, with an emphasis in biopsychology, from the University of Houston and then completed postdoctoral training in Psychiatry and Pharmacology at the University of Chicago School of Medicine. He has been on the faculty at VCU since 1973, teaching and doing research in the fields of pharmacology, psychology and substance abuse. In addition to directing a university-wide Institute for Drug and Alcohol Studies (<http://www.vcu.edu/idas/>), Dr. Balster is the Coordinator of the VCU site for the Humphrey Fellowship Program in Substance Abuse Prevention, Treatment and Policy, a State Department funded, 10-month exchange program for mid-career professionals. The VCU campus now has 29 alumni from many countries through the world. In addition, Dr. Balster is Co-Director of the Virginia Youth Tobacco Project, a statewide interdisciplinary research coalition on youth tobacco use and is the Co-Founder and Co-Director of the International Programme in Addiction Studies, an online graduate program hosted by VCU, King's College London and the University of Adelaide in Australia. Dr. Balster began his scientific career in neurobehavioral pharmacology and substance abuse research, where he helped develop laboratory animal models for the abuse-related effects of drugs such as their ability to produce intoxication, tolerance and dependence. He also has extensive experience in drug abuse potential evaluation of new medications and in the drug approval process for psychiatric, neurologic and addiction treatment products. More recently, he has been primarily interested in science administration and the



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development of multidisciplinary programs. He is working on the translation of science into practice. He also has some background in substance abuse policy and until recently served as editor-in-chief of a leading international scientific journal in the area of Drug and Alcohol Dependence.

### USAID Profile

**Office of the Global Health Initiative  
Bureau of Global Health**

Robert Balster spent his Jefferson Science Fellowship at USAID in the Global Health Bureau Office of the Assistant Administrator (GH/AA). He primarily worked on the implementation of the President's Global Health Initiative which calls for a greater reliance on an evidence-based approach to development that underpins business processes at all levels of USAID, from strategic planning to policy development to project design. Robert worked on the organization and implementation of Evidence Summits, using his expertise in medical research to help in the identification and utilization of scientific evidence, combined with expert advice, to inform development practice and policy for low and middle income countries.

### **PETER J. DAVIES**

Departments of Plant Biology and Horticulture, Cornell University

Bio - Peter J. Davies is a professor of Plant Physiology at Cornell University in Ithaca NY, where he has been a member of the faculty for 42 years in the departments of Plant Biology and Horticulture. He holds a B.Sc. and Ph.D. from the University of Reading in England, and an M.S. from the University of California at Davis. Prior to going to Cornell he held a position at Yale University. His expertise is in the field of plant development, especially plant hormones. He has published over 100 papers and several books, including three editions of the principal monograph in the field of plant hormones. At Cornell he has been teaching plant function and growth, especially to students of agriculture and horticulture. More recently he has broadened his teaching to educate non-biology students in the societal implications of advances in biology with a course covering diet to disease, DNA to deforestation.



### State Department Profile

**Office of Agriculture, Biotechnology, and Textile Trade Affairs  
Bureau of Economics, Energy and Business Affairs**

Peter Davies' area of involvement was in Agricultural Biotechnology, with special responsibility for Europe. His main tasks included: monitoring developments in agriculture and food security, especially with regard to crop biotechnology, and to interact with officials, report authors and advisory groups in this area; monitoring the status of biotech crops in Europe, and provide input to promote the acceptance of these crops on a scientific basis; providing comments to officials of the State Department, USDA and the US Trade representative on any disputes resulting from the scientific analysis of crop products; and working to obtain the approval of Golden Rice in the USA.

### **MARK EBERHART**

Department of Chemistry and Geochemistry, Colorado School of Mines

Bio - Dr. Eberhart received his Ph.D. in Materials Science and Engineering from MIT in May of 1983. Following a short postdoctoral stint at MIT, he moved to Los Alamos where he worked as a staff scientist in the Materials Science and Technology Division. It was there that Dr. Eberhart became part of a group seeking to use computational methods to design materials, as opposed to the Edisonian approach employed in conventional materials development—a program with potentially immense benefits. In 1992, he took a faculty position at Colorado School of Mines where he has been since then. To this day Dr. Eberhart continues with the work begun at Los Alamos. Because of





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his expertise in the application of computational methods in the design of materials, he is asked to sit on the technical advisory boards and visiting committees to several national laboratories. He is passionate about effectively communicating the ideas and excitement of science to the public and has written two books of popular science: *Why Things Break, Understanding the World by the Way it Comes Apart*, and *Feeding the Fire, The Lost History and Uncertain Future of Mankind's Energy Addiction*. Dr. Eberhart is active in faculty governance and is the current President of CSM's Faculty Senate.

### **NWADIUTO ESIObU**

Department of Biological Sciences, Florida Atlantic University



*Bio* - Dr Esiobu earned her Ph.D. in Microbiology from the University of Louvain, Belgium and a Post-doctoral training in Molecular Biology and Biotechnology from the Massachusetts Institute of Technology. She is the Director of the Microbial Biotechnology laboratory at the Davie campus of Florida Atlantic University where she has developed and taught many courses and labs. Her research integrates Environmental quality and health risk assessment, with emphasis on rapid detection of pathogens, source-tracking pollution and examining the role of the environment in the emergence of antibiotic resistance. She is the Chair of the International Advisory Board of the World Bank Step-B projects which provides technical guidance to several centers of excellence in science and technology in Africa. During her ten year tenure as a committee member of the Education Board and the International Education Committee of the American Society for Microbiology she has played active roles in curriculum and teaching resource development, strategic planning and performance assessment of the committee programs. She received the ASM International professor award and was recognized for outstanding service to the International Education Committee of the ASM. She has served as consultant to the African Union on Science and Technology issues, Florida Education Department on Precollege science assessment and sits on the Technology council of Broward County.

#### State Department Profiles

#### **Office of Global Food Security Secretary of State**

Nwadiuto Esiobu was a senior science advisor in the Secretary's Office of Global Food Security (S/GFS) and the Bureau of Oceans and International Scientific and Environmental Affairs Office of International Health and Biodefense (OES/IHB). She drafted and cleared technical / scientific documents for international diplomacy; prepared briefing papers for Department of State executives and served on a number of interagency task forces to develop position papers in her areas of expertise. In the S/GFS, Diuto served to advance the President's Feed the Future initiative: As such she interacted closely with many offices, agencies and international development partners (the G8, L'Aquila Food Security Initiative (AFSI) members and Comprehensive Africa Agriculture Development Program Development Partners) to promote (a) Adoption of agricultural biotechnology internationally, and in Africa in particular (b) Creation of enabling environments for sustainable food security in the context of global climatic changes and (c) Engagement of the US private sector in food security investments in Africa. She helped to organize and host the L'Aquila Food Security Initiative (AFSI) meeting in Washington DC and was closely involved with developing U.S. negotiation papers for the G8 summit in the summer.

#### **Office of International Health and Biodefense Bureau of Oceans and International Scientific and Environmental Affairs**

At OES/IHB Diuto initiated awareness and developed strategies for reducing the circulation of Counterfeit and Substandard Medicines (CSM) globally and in Africa in particular. She conducted extensive research on the scope of the problem and the nature of the hazards as well as the root causes of the issue. Her focus was the public health threats and hazards associated with the practice. She mobilized local, international and regional interventions to mitigate CSM distribution and empower consumers. She provided technical guidance for the production of Tool Kits and an awareness campaign.

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### **BRAD FENWICK**

College of Veterinary Medicine, University of Tennessee



*Bio* - Having received a doctor of veterinary medicine and master degrees from Kansas State University, Dr. Fenwick completed a residency and received a Ph.D. from the University of California, Davis focused on microbiology and immunology. Following a faculty position at the University of Florida, he was recruited by Kansas State University. During his tenure at Kansas State he built a world-class research program in infectious diseases. He has given over 150 invited lectures and keynote presentations worldwide; has published over 130 research papers, book chapters and proceeding reports; holds five patents; and has received over \$11-million in competitive research funding from federal and state agencies and private organizations. He has received numerous awards and honors including the Beecham Award for Research Excellence, the Yarborough Medicine Award, Sigma Xi Outstanding Scientist and Service Awards, the Kansas Veterinary Service Award, and the U.C. Davis Distinguished Alumni Award. He is one of a very select group who hold fellow status with both the American Association for the Advancement of Science (AAAS) and the American Council on Education (ACE). He has served on and chaired numerous professional and national organizations and committees including those with the National Academies of Science, the National Research Council, and the Association of Public Land-Grant Universities. He has served on the Oak Ridge National Laboratory Board of Governors and is on Elsevier's international Academic Executive Advisory Board. Dr. Fenwick was selected as the only veterinarian to be appointed as the Chief Scientist for the Competitive Research Programs and the National Research Initiative (NRI) of the U.S. Department of Agriculture. While at Kansas State he held numerous academic leadership and administrative positions at the department level, chaired an interdisciplinary graduate program, and served as associate dean of graduate education and president of the Faculty Senate. In 2004, he was appointed Vice President for Research at Virginia Tech and President of Virginia Tech Intellectual Properties. Recently, he served as Vice Chancellor for Research and Engagement at the University of Tennessee.

#### USAID Profile

#### **Office of Science and Technology**

#### **Bureau of Policy, Planning and Learning**

The central focus of Brad Fenwick's Jefferson Fellowship was related to his background as a University Vice President and Vice Chancellor as well as having been a Chief Scientist for USDA. Brad worked to enhance the degree of interactions between the State Department / USAID with the U.S. Universities and Colleges to the benefit of all organizations. Universities are recognizing the need to become more involved globally and the State Department / USAID are looking for fresh ideas and approaches. The first element of this is a large grant program from USAID to U.S. Universities that he helped design and for which he wrote the RFA. The second focus of Brad's Fellowship was to enhance the interactions between the State Department / USAID with the Federal science agencies.

### **DEVINDER MAHAJAN**

Materials Science & Engineering, Stony Brook University



*Bio* - Professor Mahajan holds a joint appointment between Stony Brook University and Brookhaven National Laboratory (BNL) and serves as the Site Director, NSF Center for BioEnergy Research & Development (CBERD). He received his Ph. D. from the University of British Columbia, Canada. His research interests focus on Energy issues. He is Associate Editor of the Journal of Renewable and Sustainable Energy (JRSE) and serves on the Editorial Board of International Journal of Oil, Gas and Coal Technology and The Open Petroleum Journal. He is the author of over 200 publications including book chapters, patents, and extended abstracts and he has presented over 70 invited lectures on clean energy topics, nationally and internationally. He delivered the 1997 NEDO Annual Lecture on "Catalysis and Environment" under the AIST, Japan, fellowship. His recent awards include: Member, Russian Academy of Natural Sciences (RANS)-US Section (2006), Recipient, RANS Crown and Eagle Medal of Honor (for service in the field of "Petroleum Eng." (2006), Outstanding Mentor Award from the U.S. Department of Energy

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(2007 and 2009), University Visiting Professor, Government of Italy Fellowship, Università di Roma “La Sapienza”, Roma, Italy (2008), Delegation to Universities in Beijing and Shanghai to promote the low-carbon society, China (2009), Visiting Researcher, Institute for Global Environmental Strategies (IGES), Hayama, Japan (2009) and Fulbright Specialist Scholar at the Asian Institute of Technology (AIT), Thailand (2010). His vision is to develop technologies that lead to commercialization for human welfare and train students in next-generation renewable technologies.

### State Department Profile

#### **Energy Transformation Deputate Bureau of Energy Resources**

Devinder Mahajan’s focus was on energy related issues—oil & gas and renewables. Devinder’s first task was to review domestic and international Gas Markets (both conventional and unconventional, including shale gas), look at its impact on the energy mix in future years and understand scenarios for decoupling oil and gas prices. He also worked with the India Energy Group within the bureau to expand U.S.-India engagement. He also represented the State Department on the International Energy Agency/Committee on Energy Research and Technology (IEA/CERT).

### **RICHARD MARSTON**

Department of Geography, Kansas State University

Bio - Richard Marston is University Distinguished Professor of Geography and Head of the Department of Geography at Kansas State University. Dick earned degrees in geography from UCLA (B.A. 1974) and Oregon State University (M.S. 1976, Ph.D. 1980). Dick served as the 102nd President of the Association of American Geographers in 2005-06. He has been Co-Editor-in-Chief of the journal, *Geomorphology*, since 1999. The American Institute of Hydrology first certified Marston as Professional Hydrologist #488 in 1984. Dick is a Fellow of the American Association for the Advancement of Science, American Geographical Society, Explorers Club, Geological Society of America, and Royal Geographical Society. The Association of American Geographers recognized him in 2003 with the Ronald F. Abler Distinguished Service Honors.



### State Department Profile

#### **Office of Geographer and Global Issues Bureau of Intelligence and Research**

Richard Marston served as a senior science advisor in INR/GGI. He followed developments on water resources and geohazards, including glacier changes in the Himalayas, construction of hydropower dams, and water as a global security issue. In addition to supporting his colleagues in GGI and INR in general, Richard interacted with other offices in the Department of State, including the Science and Technology Adviser to the Secretary, the Water Team (largely the Bureau of Oceans and International Scientific and Environmental Affairs), the Bureau of South and Central Asian Affairs Bureau, and Under Secretary for Civilian Security, Democracy, and Human Rights Maria Otero's office. Richard was part of a group working on a possible Global Dialogues on Emerging Science and Technology (GDEST) on Himalayan watershed management.

### **ALAN MCHUGHEN**

Botany and Plant Sciences, University of California, Riverside

Bio - Alan McHughen is a public sector educator, scientist and consumer advocate. After earning his doctorate at Oxford University, Dr McHughen worked at Yale University and the University of Saskatchewan before joining the University of California, Riverside. A molecular geneticist with an interest in crop improvement and environmental sustainability, he helped develop US and Canadian regulations testing the safety of genetically engineered



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crops and foods. He served on US National Academy of Sciences panels investigating the environmental effects of transgenic plants, a second investigating the health effects of genetically modified foods and helped review a third looking at sustainability and economic impacts of biotechnology on US agriculture. Having developed internationally approved commercial crop varieties using both conventional breeding and genetic engineering techniques, he has firsthand experience with the relevant biosafety and policy issues from both sides of the regulatory process. As an educator and consumer advocate, he helps non-scientists understand the environmental and health impacts of both modern and traditional methods of food production. His award winning book, 'Pandora's Picnic Basket; The Potential and Hazards of Genetically Modified Foods' uses understandable, consumer-friendly language to explode the myths and explore the genuine risks of genetic modification (GM) technology.

### **TIMOTHY O'BRIEN**

Department of Mathematics and Statistics, Loyola University Chicago



Bio - Dr. O'Brien obtained his Ph.D. in Statistics from North Carolina State University, and he now serves as Professor and Graduate Program Director of the Applied Statistics program at Loyola University Chicago as well as campus-wide and external statistical consultant. He was a post-doctoral researcher at the Institut National de la Recherche Agronomique (France) and at the Universität Augsburg (Germany) as a part of the National Science Foundation's Postdoctoral Research program. His current research focuses on robust optimal experimental designs whereby practitioners are provided the means to efficiently conduct their research studies with the lowest cost. He also teaches short courses worldwide on statistical consulting, statistical design, environmental and biomedical methods, and modeling of diverse systems and phenomena, and frequently teaches statistical concepts to non-technical audiences. At Loyola, Dr. O'Brien helped establish the undergraduate Bioinformatics program, and was co-PI on an NSF grant to fund undergraduate research in bioinformatics and computational genomics. He has won numerous teaching awards, and has held Visiting Professorship positions at Katholieke Universiteit Leuven (Belgium), Kuwait University, University of Natal at Pietermaritzburg (South Africa) and in Thailand at Mahidol University, NIDA, and Thammasat University. Dr. O'Brien is a Returned Peace Corps Volunteer from Benin, West Africa, where he taught Mathematics (in French), and has twice received William J. Fulbright scholarships to consult, teach and do research at Chiang Mai University in Thailand. Additionally, he has studied, taught or conducted research in approximately thirty countries outside the U.S., and regularly provides technical assistance to researchers at U.S. and international universities and organizations including Partners in Health, Statisticians without Borders, and the Infectious Disease Institute in Kampala, Uganda.

#### USAID Profile

#### **Office of Health, Infectious Disease and Nutrition Bureau of Global Health**

Tim O'Brien worked with the Global Health (GH) and the Economic Growth and Trade (EGAT) bureaus at USAID. In the context of global health in general, and infectious disease (malaria, TB, polio, neglected tropical diseases) and nutrition in particular, he provided guidance and advice on evidence-based evaluation/statistical methods, data analysis, research and experimental design, mathematical modeling, software/computer programming, and cultural issues related to sub-Saharan Africa and South-East Asia.

In furtherance of his work in environmental/spatial statistics, Tim also worked with the EGAT group on issues related to water and global climate change (GCC). He especially focused on assessing the impact of GCC on GH programs at USAID, and in developing methods to protect GH programs from the negative effects of GCC. Within his Jefferson fellowship year, he also served as Embassy Science Fellow in Rabat Morocco working on renewable/clean energy and workforce development.



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### MAX ROTHSCHILD

Department of Animal Science, Iowa State University



*Bio* - Dr. Rothschild received his B.S. in animal science from the University of California, Davis in 1974, a M.S. from the University of Wisconsin in 1975 and a Ph.D. in animal breeding from Cornell University in 1978. From 1978 to 1980 he was assistant professor at the University of Maryland. In 1980 he joined the Department of Animal Science at Iowa State University where he was eventually promoted to the highest rank of C.F. Curtiss Distinguished Professor of Agriculture and Life Sciences in 1999. More recently he was named Director of the Center for Integrated Animal Genomics and the ME Ensminger Chair in International Animal Agriculture. Dr. Rothschild has devoted his research and teaching career to the field of animal breeding and molecular genetics. He is widely recognized as a world leader in the field of livestock (especially pig) genetics and genomics. Rothschild has also been active working in developing countries, in particular Uganda, on livestock and food security issues. Since 1993 Rothschild has served as the USDA Pig Genome Coordinator. He has presented numerous invited papers in 43 countries and has over 320 refereed publications, 600 other publications and 12 patents. His awards include: Amer. Association Advancement of Science Fellow, USDA Group Honor Award, Amer. Society Animal Science (ASAS) award in Animal Breeding and Genetics, ASAS Fellow, two Research & Development 100 awards and was named Iowa Inventor of the year in 2002.

#### USAID Profile

#### **Office of Agricultural Research and Policy Bureau of Food Security**

Max Rothschild was assigned to the Bureau for Food Security, Office of Agriculture Research and Policy. His work was devoted to review and engagement of research issues that include capacity building, university engagement, crop and animal genomics, research policy and development, and monitoring of research by other research units supported by USAID. He was active in the review of USAID's Cooperative Research Support Programs (CRSP), especially the Peanut CRSP and helping to support the Board for International Food and Agricultural Development review of the CRSPs. His other activities included increasing the use of livestock to obtain food security and help small holders, especially women. In this regard, he assisted in the Norman Borlaug Commemorative Research Initiative goat genome project and the Sustainable Intensification activities in Africa directed towards improving crop and livestock systems. In addition, Rothschild worked on ways to increase University engagement with USAID and other research and development partners including increasing private sector engagement as part of Feed the Future Activities.

### DARIN TOOHEY

Atmospheric and Oceanic Sciences, University of Colorado at Boulder



*Bio* - Darin Toohey is a professor of Atmospheric and Oceanic Sciences at the University of Colorado Boulder, where he also serves on the faculty of the Environmental Studies Program and as an affiliate of the Renewable and Sustainable Energy Institute (RASEI). Previously, he helped establish the Earth System Science Department at the University of California at Irvine, where he served as assistant and associate professor from 1991 until 1998. His research addresses the chemistry and dynamics of Earth's atmosphere, with particular emphasis on observations of trace gases and aerosols and their impact on stratospheric ozone, the oxidative capacity of the atmosphere, and radiation balance. He has participated in over 40 field campaigns, most involving research aircraft and scientific balloons. He has conducted field work around the globe, including in remote locations such as Antarctica and Spitsbergen. His work helped demonstrate the link between chlorine-containing and bromine-containing compounds on the destruction of ozone over the Arctic and Antarctic. His work has been funded by the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), the Air Force Office of Sponsored Research (AFOSR), and the Methyl Bromide Global Coalition. He has coauthored 100 publications, reports, and chapters, and he has served on numerous scientific assessments, including the 2010 WMO Scientific Assessment of Stratospheric Ozone

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Depletion. Prof. Toohey has bachelors degrees in physics and in chemistry from the California State University at Fullerton, with masters and doctorate degrees in applied physics from Harvard University. He has received a number of awards, among them a National Science Foundation National Young Investigator Award (NYI), the Procter and Gamble award for outstanding student publication by the American Chemical Society, multiple NASA group achievement awards, and multiple teaching awards from Harvard University and UC Irvine. He served as editor of *Journal of Geophysical Research Atmospheres* and *Atmospheric Measurement Techniques*.

### State Department Profile

#### **Office of Economic Policy**

#### **Bureau of East Asian and Pacific Affairs**

Darin Toohey worked in the Office of Economic Policy in the Bureau of East Asian and Pacific Affairs (EAP/EP). The Office of Economic Policy reports to the U.S. Senior Official for the Asia-Pacific Economic Cooperation (APEC) who coordinates APEC activities for the United States government. Darin covered issues related to energy, environment, and "green growth" (climate-friendly, low carbon and energy efficient technologies), as well as science, technology, and innovation.

### **CURTIS L. WELLER**

Department of Biological Systems Engineering, University of Nebraska-Lincoln

Bio - Dr. Curtis L. Weller is a Professor of Food and Bioprocess Engineering with appointments in the Department of Biological Systems Engineering and in the Department of Food Science and Technology at the University of Nebraska-Lincoln. He received his BS and MS degrees in Food Science, and his PhD degree in Agricultural Engineering from the University of Illinois at Urbana-Champaign. Professor Weller is licensed to practice engineering in South Carolina and Nebraska, and is responsible for teaching courses in food and process engineering. His research responsibilities are in the broad area of food engineering with particular attention on value-added processing of agricultural commodities and physical properties determination. Concentration of the research effort of Professor Weller has been on recovery and utilization of valuable lipids in grain sorghum, and predicting microbial growth in meat products based on time and environmental conditions. He has authored or co-authored over 100 refereed journal articles, and lectured and consulted about various aspects of food processing throughout the world. In 2010, Professor Weller received the AACC International Excellence in Teaching award. Prior to his position in Nebraska, Professor Weller served on the faculty at Clemson University and in quality assurance roles in the baking and dairy industries.



### USAID Profile

#### **USAID Bureau for Food Security**

#### **Office of Markets, Partnerships and Innovation**

Curtis Weller was affiliated with the USAID Bureau for Food Security Office of Markets, Partnerships and Innovation and is housed in the Ronald Reagan Building in Washington, DC. He reviewed, studied and discerned existing information related to processing in various food, feed and bioproduct value chains for the U.S. government Feed the Future focus countries. These activities enabled him to assist in the identification of opportunities to attract and engage international and regional partners in innovative market development opportunities. Specifically, his focus was on understanding food processing issues in countries in the Horn of Africa, the establishment of the Global Food Safety Partnership with the World Bank, and the implementation of strategies to reduce post-harvest losses for food commodities.

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## # 2010 – 2011 Fellows #

### **BRUCE CONN**

School of Mathematical and Natural Sciences, Berry College

*Bio* - Dr. David Bruce Conn is Professor of Biology and Dean of the School of Mathematical and Natural Sciences at Berry College. He also serves as Associate in Invertebrate Zoology with the Museum of Comparative Zoology at Harvard University. His research on human and animal parasites, zoonotic diseases, and biological invasions includes international collaborations in Poland, Canada, Ireland, Spain, and Australia, as well as the Czech Republic where he has worked as a Fulbright Senior Specialist. He has served on the faculties of the University of Cincinnati, St. Lawrence University, and the University of the South. Dr. Conn was visiting professor in the doctoral program on human parasitic diseases at the University of Valencia, Spain, a graduate thesis examiner for the Queensland University of Technology in Australia, and is a member of the European Invasive Species Registry. He earned the B.S. from Lee University, the M.S. from Morehead State University, and the Ph.D. from the University of Cincinnati. Dr. Conn has authored more than 200 scientific publications, including 2 editions of a textbook, *Atlas of Invertebrate Reproduction and Development*, which was awarded national honors in bio- and medical publishing by the Association of American Publishers. He has lectured throughout the world, and has served as a grant reviewer or panelist for the U.S. National Science Foundation, the U.S. National Sea Grant program, the Slovak Ministry of Education, the Academy of Sciences of the Czech Republic, the European Science Foundation and the European Space Agency. He has been Associate Editor of the *Journal of Parasitology*, and is on the editorial boards of *Parasitology Research*, *Acta Parasitologica*, and *Psyche: A Journal of Entomology*. Dr. Conn has served as President of the American Microscopical Society and as President of the American Society of Parasitologists, and remains on the executive committees of both organizations.



### **BRETT DEPAOLA**

Department of Physics, Kansas State University

*Bio* - Dr. Brett DePaola is a Professor of Physics at Kansas State University. He received his BS and MS in Physics from Miami University, and his PhD in Physics from The University of Texas at Dallas. Professor DePaola's research in Atomic, Molecular, and Optical Physics covers a wide range of topics, from ion-atom collisions to coherent control using ultra-short laser pulses. The over-arching theme is the understanding of basic physical processes at the atomic level. His most recent research explores how modulating the spectral phase of ultra-short laser pulses affects coherent excitation in atoms and simple molecules. Professor DePaola has made seminal contributions to the measurement technique known as MOTRIMS, in which ultra-cold technologies are combined with charged particle technologies to create a powerful diagnostic of ion-atom and photon-atom dynamics. Professor DePaola is a Fellow of the American Physical Society. He has won numerous teaching awards and has given invited lectures world-wide. He has held Visiting Professor positions at universities in Denmark and Germany, spent time as a Visiting Scientist at RIKEN in Japan, and was a Visiting JILA Fellow in Boulder, Colorado.



### **NICHOLAS FARRELL**

Department of Chemistry, Virginia Commonwealth University

*Bio* - Dr. Nicholas P. Farrell is a graduate of University College Dublin. He obtained his PhD from Sussex University and completed postdoctoral fellowships at Simon Fraser University and The University of British Columbia. He is currently professor of Chemistry at Virginia Commonwealth University (VCU). His research interests are in the broad area of bioinorganic chemistry. Specifically his interest is in the medicinal uses of inorganic compounds and his work has included development of antiviral and antiparasitic drugs. His major research is on platinum-based anticancer agents, which are an important part of the anticancer drug armamentarium. The first genuinely



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structurally novel platinum drug to enter clinical trials in thirty years (BBR3464) arose from his laboratory research. He has received continuous funding for over twenty years from the American Cancer Society, the National Science Foundation and the National Institutes of Health for his research. Professor Farrell has written or co-edited three books in the area of platinum anticancer agents and medicinal inorganic chemistry. He is the author of over 200 refereed papers and review chapters. He and his collaborators have received over sixty patents world wide from his inventions. He was honored as Distinguished Research Scholar of Virginia Commonwealth University for 2003-2004. He was instrumental in development of a graduate program in Chemical Biology at VCU. He was the Chair of the first Gordon Research Conference on Metals in Medicine and in October 2003 chaired the Ninth International Symposium on Platinum Compounds in Cancer Chemotherapy, a meeting which unites chemists, biochemists, pharmacologists and cancer clinicians. Having begun his independent research career in Brazil, his laboratory has hosted and continues to host many international scholars and major collaborations have involved scientists from Australia, Brazil and The Czech Republic. Professor Farrell is fluent in Portuguese and speaks Spanish. He is interested in helping build scientific expertise and collaboration amongst developing countries.

### **SURESH GARIMELLA**

School of Mechanical Engineering, Purdue University

*Bio* - Dr. Suresh Garimella is Associate Vice President for Engagement, and the Goodson Distinguished Professor of Mechanical Engineering, at Purdue University where he is Director of the National Science Foundation Cooling Technologies Research Center. He received his PhD from the University of California at Berkeley in 1989, his MS from The Ohio State University in 1986, and his Bachelor's degree from the Indian Institute of Technology Madras in 1985. His areas of expertise include thermal management and energy efficiency in electronics systems, micro- and nano-scale engineering, renewable and sustainable energy systems technology and policy, and global academic-public-private partnerships. Dr. Garimella has supervised over 80 PhD and MS students, and co-authored over 500 refereed journal and conference publications and 15 patents and patent applications. Fifteen alumni from his research group are faculty members in prestigious universities around the world. Dr. Garimella has held honorary faculty positions at the Technical University of Darmstadt in Germany, Xi'an JiaoTong University in China, and the University of New South Wales in Australia. He is a member of the Board of Directors of Modine Manufacturing Company.



Dr. Garimella serves in editorial roles with several leading energy and thermal sciences-related journals. He is a Fellow of the American Association for the Advancement of Science (AAAS) and American Society of Mechanical Engineers (ASME). His efforts in research and engineering education have been recognized with the 2011 NSF Alexander Schwarzkopf Prize for Technological Innovation, the 2010 ASME Heat Transfer Memorial Award, the 2010 Distinguished Alumnus Award from IIT Madras, the 2009 ASME Allan Kraus Thermal Management Award, the 2004 ASME Gustus L. Larson Memorial Award, the 2012 Provost's Award for Outstanding Graduate Mentor, the 1995 Graduate School/UWM Foundation Research Award for Outstanding Research & Creative Activity, and the 1997 UWM Distinguished Teaching Award, among others.

#### State Department Profile

**Office of International Energy and Commodity Policy (IEC)**

**Bureau of Economic, Energy and Business Affairs (EEB)**

As a part of his Jefferson Science Fellowship, Dr. Garimella explored pathways to a clean energy future, analyzing cross-cutting issues at the intersection of energy security and climate change. He was the State Department delegate to the Committee on Energy Research & Technology (CERT) of the International Energy Agency (IEA), and also participated as a Member of the U.S.- Russia Bilateral Presidential Commission Science & Technology Working Group visit to Moscow in February 2011. He has also been serving as Senior Fellow of the State Department's Energy and Climate Partnership of the Americas (ECPA), a regional partnership announced by President Obama at the April 2009 Summit of the Americas to promote clean energy, advance energy security, fight energy poverty, reduce greenhouse gas emissions, support strategies for sustainable landscapes and build capacity for climate change adaptation.



# Jefferson Science Fellows 2004–2017

## JAY GORE

School of Mechanical Engineering, Purdue University

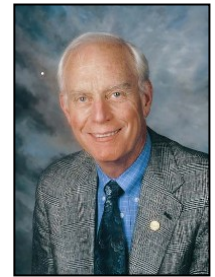
*Bio* - Dr. Jay P. Gore is the Reilly Professor of Combustion Engineering and Director of the campus-wide Discovery Park Energy Center at Purdue University. He has served as the Associate Dean of Engineering for Research and Entrepreneurship between 2002 and 2007. He received his M.S. and Ph.D. from Penn State and Post Doctoral training from the University of Michigan. He is a Fellow of the ASME and the AIAA and has served as an Associate Editor of the AIAA Journal and the ASME Journal of Heat Transfer. Jay also served as the Central States Section Chair and the US Technical Editor of the 26th International Combustion Symposium. He has received the 1988 Best Paper in Heat Transfer Literature Award from ASME, a Presidential Young Investigator Award from the NSF, a Japan Society for Promotion of Science faculty award for a sabbatical at Nagoya University, a USDOE faculty sabbatical award, and the 2007 employer of the year award from the International Association for the Exchange of Students for Technical Experience (IAESTE) for the Summer Undergraduate Research Fellowships (SURF) program prior to being selected as the Jefferson Science and Technology Fellow for service at the US State Department. Areas of research are energy and its impact on climate change and the environment, combustion and radiation heat transfer; and applying fluid flow, heat and mass transfer computations and advanced sensing in biomedical sciences. He has authored/coauthored over 300 publications and directed the work of over 50 researchers.



## DOUGLAS LAUBE

School of Medicine and Public Health, University of Wisconsin

*Bio* - Dr. Laube received his medical degree from the University of Iowa where he also completed his residency in obstetrics and gynecology in 1974. From 1974 to 1976 he served in the United States Navy Medical Corps at the Quantico Marine Corps Education and Development Command. He received a master's of education degree in health science education from the University of Iowa in 1978 followed by 17 years as a faculty member. During that time, he received 10 medical student teaching awards. Dr. Laube assumed the position of Chair of the Department of Obstetrics and Gynecology at the University of Wisconsin in 1993 and served in that capacity until September of 2006. In May of 2006 Dr. Laube became President of the American College of Obstetricians and Gynecologists (ACOG) after having served in a number of capacities in clinical educational organizations including: the Council on Residency Education in Obstetrics and Gynecology which he chaired from 1996 to 1999, the National Board of Medical Examiners (NBME), the United States Medical Licensing Exam (USMLE), as well as serving as an oral examiner for the American Board of Obstetrics and Gynecology for twenty-two years. He has had experience in educational development programs in the central Asian states of Kazakhstan and Kyrgyzstan from the mid 1990's through 2000 as well as serving as an educational consultant to assist in curriculum development for post graduate education in maternal health in Afghanistan from 2003 to 2005. Most recently he has served as an educational consultant for a joint project between ACOG and the Federation of Central American Societies of Ob/Gyn (FECASOG) in unifying post graduate residency curricula in six Central American countries (Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama). He is currently working with the State Department of Health in Wisconsin to address the issue of maternal health outcomes/disparities as well as other national reproductive health boards including Physicians for Reproductive Choice (PRCH) and the Centering Health Care Institute (CHI).



## DAVID LEA

Department of Earth Science, University of California, Santa Barbara

*Bio* - Dr. David Lea is Professor of Earth Science and member of the Marine Science Institute at the University of California, Santa Barbara, where he has been a faculty member since 1989. He received his Ph.D. in Oceanography from the Massachusetts Institute of Technology – Woods Hole Oceanographic Institute Joint Program in 1990. His research interests include climate



## Jefferson Science Fellows 2004–2017

change, global warming, climate evolution during the Ice Ages, marine geochemistry and the carbon cycle. He has published over 80 scholarly papers on these topics, including 16 in the high profile journals *Science* and *Nature*. His major research findings include developing several proxies to reconstruct temperature and other climate variables from oceanic sediments, establishing patterns of climate change in the Ice Age tropics, and evaluating links between past greenhouse gas changes and climate change. Dr. Lea has been a Visiting Professor at the University of Chicago and University of Cambridge, UK. His awards include the UCSB Academic Senate Distinguished Teaching Award (2001), a John Simon Guggenheim Fellowship (2002-03), a Leverhulme Visiting Professorship, a Clare Hall Visiting Fellowship (both 2002-03, Cambridge, UK), the American Geophysical Union Emiliani Lectureship (2007), given for “outstanding scientific contributions to our understanding of past oceans and climates,” and a Leopold Environmental Leadership Fellowship (2009). He developed and chaired UCSB’s 2007 Global Warming-Science and Society Event Series, which drew over 3600 attendees.

### THOMAS MILLER

Department of Entomology, University of California, Riverside

Bio - Dr. Miller is an insect physiologist who discovered the myogenicity of insect hearts as a graduate student at UC Riverside. He revealed the function of cardiac neurons in the heart of the American cockroach heart during postdoctorals at University of Illinois and University of Glasgow. He then was hired back at University of California, Riverside where he made fundamental discoveries in insect synaptic transmission and the mode of action of insecticides. He then applied this knowledge to aid the California Cotton Pest Control Board in solving problems associated with pink bollworm, the key pest in California. He modified pheromone traps to measure insecticide resistance in pink bollworm in cotton fields overnight, showed the number of males trapped depended critically on weather conditions, identified diapause associated protein in pink bollworm and based an ELISA method on this that revolutionized the measurement of diapause in pink bollworm. The USDA and Cotton Pest Control Board then asked Dr. Miller to produce a pink bollworm engineered to contain a lethal gene to supplement the radiation-based sterile insect control method. Transgenic pink bollworm became the first insect genetically altered for practical purposes and led to new regulatory oversight approaches. Dr. Miller was awarded the Gregor Mendel Gold Medal from the Czech Academy of Sciences for these and other research projects. He currently is working on recombinant methods to improve biopesticides.



### PETER REVESZ

Department of Computer Science and Engineering, University of Nebraska, Lincoln

Bio - Dr. Peter Revesz is Professor of Computer Science and Engineering at the University of Nebraska-Lincoln. His research interests include database systems, bioinformatics, and geoinformatics. He directed the development of two databases systems: the MLPQ system for constraint, spatial and moving objects databases, and the PROFESS system for genome databases. He is the author of the textbooks *Introduction to Constraint Databases* (Springer 2002) and *Introduction to Databases: From Biological to Spatio-Temporal* (Springer 2010). Dr. Revesz served as the co-chair of several international conferences. He was invited as a visiting researcher to several universities and research laboratories including as a William J. Fulbright U.S. Senior Scholar at the University of Athens in Greece, and as an Alexander von Humboldt Research Fellow at the Max Planck Institute for Computer Science in Germany. Dr. Revesz earned his Ph.D. from Brown University and was a postdoctoral researcher at the University of Toronto.



#### State Department Profile

#### **Export Control and Border Security**

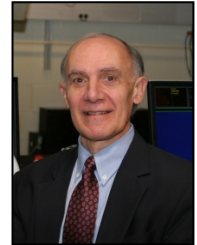
Dr. Revesz worked on the Export Control and Border Security (EXBS) initiative that assists more than 60 countries in improving their trade control systems to prevent the proliferation of weapons of mass destruction and the irresponsible transfer of advanced conventional weapons. He taught a “Databases and Data Mining for Commodity

## Jefferson Science Fellows 2004–2017

Targeting” course to customs and export control officials in Kenya and the Ukraine and worked on a proposal to the World Customs Organization for an international targeting software development. He was also part of a U.S. delegation in Vienna to the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies, where 40 countries met to maintain lists of controlled items

### ARTHUR SANDERSON

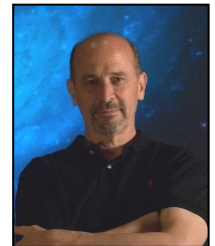
Department of Electrical, Computer and Systems Engineering, Rensselaer Polytechnic Institute



*Bio* - Dr. Arthur C. Sanderson is Professor of Electrical, Computer and Systems Engineering at Rensselaer Polytechnic Institute in Troy, N.Y. His research on the theory and development of robotics and intelligent systems includes fundamental contributions to sensor-based robotic control, planning and reasoning for intelligent systems, and distributed sensor networks. He has applied his research to manufacturing, biomedical engineering, environmental monitoring, space exploration, and security and defense systems. Dr. Sanderson received his B.S. degree from Brown University and his Ph.D. degree from Carnegie Mellon University. He has held faculty positions at Carnegie Mellon University, where he was Co-Director of the Robotics Institute, and at Rensselaer Polytechnic Institute where he has served as Department Head and as Vice President for Research. He has collaborated extensively with industry and was the Director of Information Sciences at Philips Laboratories, Briarcliff Manor, NY, from 1985-1987. He was instrumental in establishing the IEEE Robotics and Automation Society and served as its President. He is a Fellow of the IEEE and recipient of the IEEE Millennium Medal. From 1998-2000, he was Division Director of Electrical and Communications Systems research at the National Science Foundation. He has held international visiting positions at Delft University of Technology in the Netherlands, Universidad Iberoamericana in Mexico, and the University of Tsukuba in Japan. He has recently worked on the development of autonomous underwater vehicles and distributed sensor networks with application to environmental monitoring and security and defense systems. He has served as a Visiting Research Fellow of the Autonomous Undersea Systems Institute and Senior Research Advisor for The Beacon Institute for Rivers and Estuaries. Dr. Sanderson is the author of six books and more than 250 publications.

### NICHOLAS SUNTZEFF

Department of Physics and Astronomy, Texas A&M University



*Bio* - Dr. Nicholas Suntzeff is an observational cosmologist and holds the Mitchell/Heep/Munnerlyn Chair of Observational Astronomy in the Department of Physics & Astronomy at the Texas A&M University in College Station Texas. He specializes in the study of supernovas, stellar populations, stellar abundances, galaxy evolution, and astronomical instrumentation. Dr. Suntzeff is cofounder of a group which in 1998 announced definitive evidence for acceleration in the local Universe implying the Universe is 75% filled with dark energy. Suntzeff has received a number of awards including Science Magazine Breakthrough of the Year of 1998, the Gruber Prize in Cosmology of 2007, and the AURA Science Award in 1992 and 1998. He won the Robert Trumpler Award for the outstanding astrophysics Ph.D. thesis of the year from North American universities in 1983. From 1982 to 1986 he was a Carnegie Fellow at Mt. Wilson and Las Campanas Observatories of the Carnegie Institute of Washington. In 1986 he moved to La Serena Chile to work at the Cerro Tololo Inter-American Observatory and the National Optical Astronomy Observatory for 20 years, where he rose to the rank of Astronomer and Associate Director of Science. Most recently, Dr. Suntzeff moved to Texas A&M University to found an astronomy program and help direct the Mitchell Institute for Fundamental Physics and Astronomy. He also founded the Charles Munnerlyn Astronomical Laboratory and Space Engineering program. Suntzeff serves on the boards of museums, observatories, and private companies. He is presently an elected councilor of the American Astronomical Society, and will become its Vice President in June 2010. He received a B.S. with distinction in Mathematics in 1974 from Stanford University, and a Ph.D. in Astronomy & Astrophysics from UC Santa Cruz and Lick Observatory in 1980. Suntzeff is a native of Corte Madera California.



## Jefferson Science Fellows 2004–2017

### MITCHELL TURKER

Center for Research on Occupational and Environmental Health, Oregon Health & Science University



*Bio* - Dr. Mitchell Turker is a Senior Scientist at the Center for Research on Occupational and Environmental Toxicology (CROET) and a Professor of Medical and Molecular Genetics. He received a Ph.D. from the University of Washington in 1984 and a J.D. from the Lewis and Clark Law School in 2008. Dr. Turker was a NSF postdoctoral fellow in Plant Biology and a faculty member at the University of Kentucky before moving to Oregon in 1996. Dr. Turker's research emphasis is on the interaction between the environment and the cellular DNA, with a focus on early events in cancer initiation. These events include mutations, which are alterations in the DNA sequence, and epigenetic changes, which are more subtle DNA modifications. Ongoing research supported by NASA is designed to determine the effects of space radiation on cells in intact organs. An ongoing project supported by NIH will develop a model that will be used to test the ability of dietary compounds to prevent the transition of normal cells to cancer cells. Future work will examine the ethical, legal and social implications from rapid advances being made in epigenetic science, including the effects of chemical exposures.

### # 2009 – 2010 Fellows #

### CYNTHIA BALDWIN

Department of Veterinary and Animal Sciences, University of Massachusetts, Amherst



*Bio* - Dr. Cynthia Baldwin received a PhD in Immunology from Cornell University. Her research area is vaccine design based on cellular immune responses. Her interest is in international agriculture, specifically the impact of infectious disease on food animal health and therefore human health. She is interested in vaccines both to infectious disease agents that cause zoonotic diseases in humans (those acquired by humans as a result of contact with infected animals or their food products) and those that only infect livestock but, as a result, impact food supply. Her work includes the study of protective immune responses to the bacteria *Brucella* that infects livestock species, causes zoonotic infections in humans worldwide and is classified as a potential biowarfare agent. Her laboratory also conducts basic immunological research on T lymphocytes of ruminants, knowledge needed to develop vaccines to prevent infections in cattle and sheep. They recently participated in the international project to sequence and annotate the genome of cattle and are known for their work on gamma delta T lymphocytes and their role in protective immune responses. Currently, Dr. Baldwin is a Professor in the Department of Veterinary and Animal Sciences at the University of Massachusetts (Amherst) and a member of the Cellular and Molecular Biology interdepartmental graduate program. In the 1980s she worked as a postdoctoral fellow and scientist at the CGIAR laboratory in Nairobi, Kenya and was subsequently a faculty member in the microbiology department at Ohio State University. Dr. Baldwin was named the 2002 Distinguished Veterinary Immunologist and is a member of the American Association of Immunologist, the American Society for Microbiology, has been president of the American Association of Veterinary Immunologists and chaired the international organization Brucellosis Research Workers.

Currently she is on the veterinary immunology committee of the International Union of Immunological Societies and editor of the journal *Veterinary Immunology and Immunopathology*. She is interested in building scientific capacity in developing countries for disease surveillance and research and fostering long-term collaborations between scientists in those countries and the USA.

*USAID Profile* - Dr. Cynthia Baldwin focused her efforts at the U.S. Agency for International Development (USAID) on the International Research and Biotechnology team in the Office of Environment and Science Policy in the bureau of Economic Growth, Agriculture and Trade. Dr. Baldwin initiated the first pilot program of an MOU between the National Science Foundation and USAID that will fund a number of partner research projects in



## Jefferson Science Fellows 2004-2017

developing countries. Additionally, Dr. Baldwin served with a small working group to determine the research agenda for the Feed the Future (FtF) Initiative, which will increase funding for agriculture research in light of the needs for a growing population. As part of her participation, Dr. Baldwin traveled to Africa and Rome to conduct consultations, co-authored a webpage on the initiative, contributed to Presidential and Secretarial speeches on the topic, and organized workshops with other U.S. government agencies. In addition to her work at USAID, Dr. Baldwin participated in the U.S. Department of State delegation to New Zealand for a Joint Commission Meeting on science and technology cooperation and subsequently organized a US-NZ follow-on workshop on animal health in the US. Dr. Baldwin continues to meet with colleagues at USAID and plans to travel to Africa to continue her work with the FtF initiative.

### **JEROME DOBSON**

Department of Geography, University of Kansas

Bio - Dr. Jerome E. (Jerry) Dobson is a Professor of Geography at the University of Kansas and President of the American Geographical Society. He will spend academic year 2009-2010 as a National Academy of Sciences Jefferson Science Fellow at the U. S. Department of State. In 2009, the Geographic Information Systems and Science Specialty Group of the Association of American Geographers honored him with its Robert T. Aangeenbrug Distinguished Career Award. In 2008, the Cartography and Geographic Information Society (CaGIS) honored him with its first ever Distinguished Career Award for lifetime achievement, and he was inducted as an elected Fellow of the American Association for the Advancement of Science. He is a Fellow of the Royal Geographical Society and previously served as Chair of the Honors Committee of the Association of American Geographers. Dobson's principal contributions include the paradigm of automated geography, his instrumental role in originating the National Center for Geographic Information and Analysis (NCGIA), his leadership of the effort to advance remote sensing methods for large-area change analysis as part of NOAA's Coastal Change Analysis Program (C-CAP), and his leadership of the LandScan Global Population Database, which has become the de facto world standard for estimating populations at risk during natural disasters, wars, and terrorist acts (including biological and chemical agents). His current research includes testing a new system for mapping minefields without walking on them; designing and promulgating a new world standard for cartographic representation of landmines, minefields, and mine actions; and leading four AGS Bowman Expeditions to conduct fieldwork in Mexico, the Antilles, Colombia, and Jordan.



State Department Profile - Dr. Jerome Dobson served as a senior scientist in the Office of the Geographer and Global Issues. His portfolio included four major topics of interest. The first was a focus on human geography, including the understanding of culture, language, lifestyles and livelihoods, through the Bowman Expeditions program. This program leads participatory mapping in a number of countries throughout the world, and Dr. Dobson with his office worked to expand the program in an effort to converge efforts across government agencies and organizations around the world. His second focus was to lead the progress of DemoBase, a new population database, which, in conjunction with the Census Bureau's International Programs Center, is being developed country by country throughout the world. Dr. Dobson also worked to improve the use of geographic information systems in the State Department and Agency for International Development in order to improve their internal infrastructure and capacity to coordinate worldwide programs. Finally, Dr. Dobson authored an opinion editorial on the BP Oil Spill from a geographer's perspective that was seen by a number of officials in the U.S. government. Dr. Dobson continues to participate in the Office of the Geographer efforts on human geography, participatory mapping and the Bowman Expeditions.

### **DIANA FARKAS**

Department of Materials Science, Virginia Tech

Bio - Dr. Diana Farkas is Professor of Materials Science and engineering at Virginia Tech. She completed her doctorate in Applied Science in Metallurgy at the University of Delaware in 1980,



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and did her postdoctoral work at the Max Planck Institut für Eisenforschung in Düsseldorf, Germany. She also holds an MS degree in Economics from Virginia Tech. She has published over 190 papers or book chapters to date. She is a fellow of the American Society for Metals. She has been a Fulbright scholar and has held visiting positions in several Latin American countries as well as in Europe and the US, including Brown University, MIT and Livermore National Laboratory. Dr. Farkas' main research interests lie in the structure of defects in alloys and the relationship of these structural characteristics with materials behavior. She focuses on modeling techniques for the study of material properties using large-scale massively parallel computer simulation. Atomic scale models for mechanical behavior of nano-structured materials is one of her main research interests in recent years.

State Department Profile - Dr. Farkas worked in the Office of Science and Technology Cooperation in the Bureau of Oceans, Environment and Science and in the Bureau of Western Hemisphere Affairs. She traveled several times to Latin America where she presented lectures on faculty exchange and scientific innovation in industry, as well as promoted collaborative scientific endeavors to help build diplomatic bridges between the U.S. and other countries. Dr. Farkas organized and took part in a number of ministerial level bilateral science and technology cooperation meetings between the U.S. and Brazil, Argentina, and Uruguay. Additionally, she worked with the Organization of American States (OAS) on "Engineering for the Americas," an initiative to improve engineering curricula in Latin American countries. Dr. Farkas participated in the development of the 2010 Strategic plan for the National Nanotechnology Initiative, an effort to coordinate national and international nanotechnology activities, and is involved in the Pan-American Nanotechnology Network. Dr. Farkas recently organized a U.S.-Brazil Innovation forum to discuss best practices for transferring scientific and technical innovation from the university to industry.

### DEBORAH LAWRENCE

Department of Environmental Sciences, University of Virginia



Bio - Associate Professor Deborah Lawrence conducts conservation-oriented ecological research in tropical forests. She currently works in southern Mexico, a global hotspot of deforestation, and northeastern Costa Rica, where reforestation is now replacing deforestation. She also worked for a decade in the rainforest margins of Indonesian Borneo. Out of college, she received a Fulbright scholarship for research in Cameroon and she was just recently awarded a Fulbright and a Guggenheim fellowship for new research in Thailand. Her research focuses on how nutrient cycling is affected by deforestation and subsequent changes in land-use. In the Yucatan, Lawrence has worked since 1998 with an interdisciplinary team including geographers, economists, remote sensing scientists, anthropologists and hydrologists, as well as ecologists. The team approaches the tropical landscape as a coupled system with feedbacks between human decision-making and dynamics of the physical and biological systems they inhabit. Lawrence is also studying this topic with an interdisciplinary group of scientists at La Selva Biological Station in Costa Rica. Lawrence's current research grew out of her work in West Kalimantan, where she reconstructed land use histories to study changes in tree diversity, landscape structure, and soil nutrients during 200 years of shifting cultivation. Over the past eight years, she has involved over 40 students, graduate and undergraduate, in her research, emphasizing both the intellectual stimulation and the social urgency of understanding the ecological effects of tropical land use change. Lawrence's research also reaches into her teaching and into her role as director of the Program in Environmental and Biological Conservation (EBC) within Environmental Science at the University of Virginia.

State Department Profile - Dr. Lawrence worked as the scientific advisor on forests and climate in the Office of Global Change at the US Department of State where she also supported the office of the Special Envoy for Climate Change. She focused on international negotiations and bilateral efforts to reduce emissions from deforestation and degradation (REDD) in tropical forests. She served on the US delegation to the United Nations Framework Convention on Climate Change, the World Bank Forest Carbon Partnership Facility, the Group on Earth Observations and its Forest Carbon Task. She participated in two inter-agency scoping missions on REDD in Indonesia, serving as the point person for development of a State Department program to support the development of an Indonesian Climate Change Center. Prof. Lawrence also served on a USAID assessment on REDD programming in Southeast Asia. She was also involved in the Science and Technology and Environment Working

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Groups for the US-Russia Bilateral Presidential Commission, with a special focus on Black Carbon in the Arctic. During the next phase of her Jefferson Fellowship, she hopes to remain engaged with the Indonesian Climate Change Center as an Embassy Science Fellow.

### NAJMEDIN MESHKATI

Viterbi School of Engineering, University of Southern California

*Bio* - Dr. Najmedin (Najm) Meshkati is a Professor at the Sonny Astani Department of Civil/Environmental Engineering and a Professor at the Daniel J. Epstein Department of Industrial and Systems Engineering at the Viterbi School of Engineering, University of Southern California (USC). His research is concerned primarily with the risk reduction and reliability enhancement of complex and large-scale socio-technical systems. These include such systems as the five modes of transportation and their facilities, energy generation (e.g. nuclear power) plants, petrochemical plants and refineries, transmission and distribution grids, and telecommunication networks. He has inspected many nuclear power and petrochemical plants around the world including Chernobyl in May 1997. He is an elected Fellow of the Human Factors and Ergonomics Society (HFES) and a recipient of the HFES's Oliver Keith Hansen Outreach and research award, an AT&T Faculty Fellow in Industrial Ecology, a twice NASA Faculty Fellow at Jet Propulsion Laboratory, and a recipient of the Presidential Young Investigator Award from the National Science Foundation. He simultaneously received a B.S. in Industrial Engineering and a B.A. in Political Science in 1976, from Sharif (Arya-Meher) University of Technology and Shahid Beheshti University (National University of Iran), respectively; a M.S. in Engineering Management in 1978; and a Ph.D. in Industrial and Systems Engineering in 1983 from USC.



### WAYNE PENNINGTON

Department of Geological and Mining Engineering and Science, Michigan Technological University

*Bio* - Dr. Wayne D. Pennington is a geophysicist at Michigan Technological University, where he is also the Chair of the Department of Geological and Mining Engineering and Sciences. His research interest is centered on the response of Earth materials to changes in physical conditions, such as stress, saturation, and temperature. The applications of this interest are found in induced seismicity, deep earthquakes, and oil and gas exploration and development. Dr. Pennington has worked in academia and in industry, and has conducted field work at sites around the world. In the 1970's, he studied tectonic earthquakes in Latin America and Pakistan. In the early 1980's, he was on the faculty at The University of Texas at Austin, and studied the relationship of earthquakes to oil and gas production. Following that, he worked at the research laboratory for Marathon Oil Company, studying techniques to improve the identification of, and production from, oil and gas reservoirs. Since 1994, he has been at Michigan Tech, teaching and conducting research into geophysical observations of oil and gas production. He has served as the First Vice-President for the Society of Exploration Geophysicists, published over 30 papers, and co-authored (with his students) one book. His degrees are from Princeton University, Cornell University, and the University of Wisconsin-Madison.



*USAID Profile* - Dr. Pennington worked in the Office of Infrastructure and Engineering within the Bureau of Economic Growth, Agriculture, and Trade at the U.S. Agency for International Development, and after the new Office of Science and Technology was created in spring of 2010, shared his appointment in that office. While he worked on issues relating to earthquake hazard in Afghanistan and science and engineering projects in Pakistan, the M7.0 Haiti earthquake occurred in January, and affected much of what he did after that date. He coordinated scientific and engineering teams heading to the Haiti, presented talks for non-technical audiences on the seismology of Haiti, and co-organized a workshop on informing Haiti's reconstruction with science and engineering. His travels included Haiti and Nepal. He plans to continue working with USAID on technology for joint civilian-military approaches to emergency response and disaster risk reduction.

## Jefferson Science Fellows 2004–2017

### JOHN SAVAGE

Department of Computer Science, Brown University



*Bio* - Dr. John E. Savage earned his PhD in Electrical Engineering at MIT in 1965 specializing in coding and information theory. He joined Bell Laboratories in 1965 and the faculty of the Division of Engineering at Brown University in 1967. In 1979 he co-founded the Department of Computer Science at Brown and served as its second chair from 1985 to 1991. By the early 1970s his research interests changed to theoretical computer science. He currently does research on computational nanotechnology, the performance of multicore chips, and reliable computing with unreliable elements. He has spent sabbaticals in the Netherlands (Eindhoven University of Technology), France (Institut National de Recherche en Informatique et en Automatique, Université Paris-Sud, and École Polytechnique), England (University of Warwick), and the US. He was awarded Fulbright-Hays Research Award and a Guggenheim Fellowship in 1973. He is a Fellow of AAAS and ACM and a Life Fellow of IEEE.

*State Department Profile* - Dr. John Savage served as an analyst in the Cyber Affairs Office in the Bureau of Intelligence and Research, where he provided his expertise in the general area of cyber security. During the year he organized a State Department conference on “Identity Management in an Open Society” which drew representatives from more than a dozen federal agencies. He sat on five cyber security-related government committees, including Architecture R&D Sub-IPC and Interagency Working Group on Cyber Security and Information Assurance, among others. Dr. Savage attended a number of meetings organized by the International Communication and Information Policy Office to prepare for meetings of the International Telecommunication Union, for which he served as a member of the U.S. delegation. Additionally, Dr. Savage spoke at a number of venues on Cyberspace and security at the State Department, National Science Foundation, Brown University, the Institute for Defense Analysis, and in Singapore at a Global Futures Forum. Dr. Savage continues his relationship with the State Department as an IC Associate.

### JAMES STONE

Department of Physics, Boston University



*Bio* - Dr. James Stone is Professor of Physics and Director of Graduate Studies in Physics at Boston University. His research in particle physics has focused on experimental tests of grand unified theories through searches for nucleon instability and through studies of the interactions of neutrinos. His experiments utilize massive particle detectors located in deep underground caverns. In 1987, Stone and his collaborators announced the first observation of a burst of neutrinos being emitted by a supernova in the Large Magellanic Cloud; and in 1998, Stone and U.S./Japanese collaborators presented data showing that neutrinos were massive particles, extending the current understanding of the constituents of matter and imposing a revision of the standard model of particle physics. Professor Stone and his collaborators shared the Bruno Rossi Prize and the Asahi-Shinbun Prize for these research accomplishments. He has authored/co-authored more than 250 journal articles and edited a book on magnetic monopoles. He has served on numerous panels and review committees for the National Science Foundation and the U.S. Department of Energy’s Office of Science. Over the course of his career, Professor Stone has lectured worldwide at physics conferences and schools, contributing to science literacy and to advanced technical/science education in developing nations. He directed a series of summer schools at the Abdul Salam Centre for Theoretical Physics in Trieste, Italy. He is currently the U.S. Co-Spokesperson of the Super-Kamiokande Collaboration and senior scientist at the Institute for the Physics and Mathematics of the Universe at the University of Tokyo. Professor Stone is a graduate of Ohio University (B.S.) and The University of Michigan (M.S. and Ph.D.). Prior to joining Boston University he was a postdoctoral researcher at the European Centre for Nuclear Research (CERN) in Geneva, Switzerland.

*State Department Profile* - Dr. James Stone served as an intelligence analyst on global scientific and technical issues for the Bureau of Intelligence and Research, Office of Economic Affairs at the U.S. Department of State. His portfolio included projects on climate change issues, nuclear power demand and export, nuclear non-proliferation,



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alternative energy technologies, and global scientific cooperation and education exchanges. Dr. Stone prepared briefings for a number of audiences including the Secretary, assistant and deputy secretaries, and other intelligence agencies of the U.S. Government, among others. Throughout the year, Dr. Stone traveled to Asia; to China for an APEC ministerial meeting on science education and to Japan on a number of occasions for discussions with officials at Japanese ministries and nuclear power industries. In conjunction with his interactions with Japanese officials, Dr. Stone performed an in-depth study of Japanese nuclear power plant exports and nonproliferation, and produced an assessment report on the findings. Additionally, he was a member of the U.S. delegation to the ASEAN Regional Forum on Nuclear Non-Proliferation and Disarmament. He currently serves with the National Intelligence Council IC Associates and is teaching a science policy course at his university.

### **KENNETH VEROSUB**

Department of Geology, University of California, Davis



Bio - Dr. Kenneth L. Verosub is Distinguished Professor in the Geology Department at the University of California, Davis. He received a B.A. degree in physics and math from the University of Michigan as well as a Ph.D. in physics and an M.S. in geophysics from Stanford University. After teaching for three years at Amherst College in Massachusetts, he joined the faculty at the University of California, Davis. In his professional research, Prof. Verosub uses the magnetic properties of rocks, sediments and soils to study the behavior of the Earth's magnetic field, to determine the ages of sedimentary sequences, to map the motions of tectonic plates, and to decipher the history of climate during the past 40 million years. Recently he has become more generally interested in the influence of geologic processes on the development of societies, civilizations and cultures. His research has taken him to over 40 countries, including three trips to Antarctica for which he received the Antarctic Service Medal from Congress. Prof. Verosub is a fellow of the Geological Society of American and the Royal Astronomical Society. He is a recipient of the Davis Prize for Excellence in Undergraduate Teaching and Scholarly Achievement, and in 1996 he was named California Professor of the Year by the Carnegie Foundation for the Advancement of Teaching. Last year, he served as visiting professor at the Institut de Physique du Globe in Paris.

State Department Profile - Dr. Verosub spent the majority of his Fellowship with the Office of Environmental Policy (ENV) in the Bureau of Oceans and International Environmental and Scientific Affairs (OES) at the U.S. Department of State working on the Department's water initiatives. He organized and participated in meetings on water-related issues with USG agencies, the World Bank, NGOs, private companies, and high-level delegations, as well as represented the State Department in international meetings on transboundary water issues and the water-related aspects of science and technology cooperative agreements. Dr. Verosub prepared briefing books for the Secretary and the Strategic Dialogue on Water in Pakistan, after which he contributed to an on-going discussion of the interrelationship between water issues and national security involving the Department, the National Security Council and the National Intelligence Council. Although the in-residence portion of his JSF has ended, Dr. Verosub continues to be involved in discussions with the office about current water issue.

## ✦ 2008 – 2009 Fellows ✦

### **ROBERT BUTERA**

School of Electrical and Computer Engineering, Georgia Institute of Technology



Bio - Dr. Robert Butera is a Professor of Electrical and Computer Engineering and the Faculty Director of Graduate Studies at the Georgia Institute of Technology, in Atlanta, GA. Prior to starting his Jefferson Science Fellowship, he served for three years as Director of Georgia Tech's Interdisciplinary Bioengineering Graduate Program. His research interests include neural engineering, cellular neurophysiology, and the neural control of breathing. He is a Fellow of the American Institute of Medical and Biological Engineers and a past recipient of the NSF CAREER award (2004) and James S. McDonnell Foundation 21st Century Scientist Award (2001). Dr. Butera currently serves as an elected representative on the

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AdCom (governing board) of the IEEE Engineering in Medicine and Biology Society, Deputy Editor-in-Chief of the IEEE Transactions on Biomedical Circuits and Systems, Associate Editor of the Journal of Theoretical Biology, and has served on numerous research and educational grant review panels for both NSF and NIH. Recently, he has co-developed new courses in both freshmen engineering education and graduate-level training in biomedical research conduct. Dr. Butera is a graduate of Georgia Tech (BEE, 1991) and Rice University (PhD, 1996), and prior to joining Georgia Tech he was a postdoctoral researcher at the National Institutes of Health.

State Department Profile - Dr. Robert Butera worked in the Office of Chemical and Biological Weapon Threat Reduction, specifically on policy issues related to biosecurity from a nonproliferation perspective. During his tenure, he represented the State Department in several interagency working groups on pathogen security issues, attended several international panels on biosecurity issue awareness, delivered lectures to non-scientists, and worked to incorporate a science policy exercise into courses at the Foreign Service Institute. Dr. Butera also contributed to the discussions and final report of the “Working Group on Strengthening the Biosecurity of the United States,” where he contributed to policy research and recommendations in the areas of both personnel reliability and international interactions.

### TIM DEVOOGD

Department of Psychology, Cornell University

Bio - Dr. Tim DeVoogd is a neurobiologist at Cornell University, active in research and teaching. For much of his career, he has studied neuroanatomical effects of learning, looking at neural consequences of song learning and spatial learning in songbirds. He and his students have shown that these two forms of learning are similar in mechanism and brain localization to equivalent forms of learning in mammals—with which birds have not had common ancestors perhaps 300 million years. In his professional life, he has chosen research collaborations and teaching commitments that have brought him into close contact with scientists and students in more than a dozen countries (sabbaticals at Oxford, University of Cape Town, and National University of Singapore). In Qatar, Singapore and South Africa, he has taught students for whom English was not their first language. Through these interactions, he became interested in scientific exchange as a vehicle for understanding. Our university system is one of our great strengths. Ideally, each time we train foreign students who return, we aid in the development of their home countries, we foster lasting ties with American scientists and educators, we nurture a problem-solving mode of thinking, and we create friends—friends of the university in which they trained, and of the United States. This vision of university interactions throughout the world has been articulated by recent Cornell presidents, and will be a focus of his work as a Jefferson Science Fellow.



State Department Profile - Dr. Timothy DeVoogd spent his tenure in the Office of Diplomacy and Public Affairs in the Bureau of Western Hemisphere Affairs, where he worked on improving science and technology ties between the U.S. and Latin American countries through a variety of methods. Dr. DeVoogd directed the creation and implementation of a Western Hemisphere science website that allows for exchanges of ideas, equipment, and event announcements in the region; he pushed for more access to scientific journals, websites, and magazines for the Science Corner program in Chile; he worked to devise an engineering accreditation program to be used throughout the western hemisphere; and he supported several innovative small initiatives in Paraguay, Ecuador and Colombia. Dr. DeVoogd also met on multiple occasions with science and health ministers, scientists and other government officials, as well as gave numerous presentations for university or public audiences.

### MICHAEL EL-BATANOUNY

Physics Department, Boston University

Bio - Dr. Michael El-Batanouny is a Professor of Physics at Boston University. He received his M.S. and Ph.D. degrees from the University of California, Davis. Prior to joining the Physics Faculty at Boston University, he held the positions of Research Associate and Research Scientist at



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Brookhaven National Laboratory in Upton New York. Dr. El-Batanouny's research is in the area of condensed matter physics, and surface physics in particular. His research has focused on diverse topics such as the interaction of hydrogen with metals and metallic composite films, nonlinear phenomena at surfaces, and he pioneered and developed a novel technique that employs beams of specially prepared magnetic helium atoms to study the magnetic surface structure and magnetic surface waves. Dr. El-Batanouny has authored/co-authored more than 100 journal articles, and is the author of a new book titled *Symmetry and Condensed Matter Physics: A computational Approach*, published by Cambridge University Press (2008). Dr El-Batanouny has been invited to give lecture series at the University of Perugia, Italy, at the Instituto de Matematicas y Fisica Fundamental, Consejo Superior de Investigaciones Cientificas, Madrid, Spain, and at the Max Planck Institute, Göttingen, Germany.

State Department Profile - Dr. Michael El-Batanouny worked in the Office of International Communications and Information Policy, part of the Bureau of Economics, Energy and Business, where he focused on issues facing the international community with respect the Internet. He served as a U.S. delegate to the International Telecommunications Union (ITU) where he was asked to formulate documents to establish a worldwide focus group on Future Networks (FGFN), which he later attended. Dr. El-Batanouny also took the initiative to provide U.S. policymakers educational briefings on the internet and the issues it will face in the near future. He did so by developing an explanatory guide and giving presentations on cyber-network essentials tailored to his and other offices in the State Department. He also organized a conference, "Future Cyber-Networks: Evolution or Revolution," that engaged experts from industry and academia with State Department officials and other U.S. government representatives.

### STEVEN GARRETT

Graduate Program in Acoustics, Pennsylvania State University

Bio - Dr. Steven Garrett received his Ph.D. in Physics from UCLA in 1977. He continued research in quantum fluids at the University of Sussex in England followed by two years in the Physics Department at the University of California at Berkeley as a Fellow of the Miller Institute for Basic Research in Science. Dr. Garrett joined the faculty of the Naval Postgraduate School in 1982 where his research efforts were concentrated on the development of fiber-optic sensors and thermoacoustic refrigerators. He left NPS in 1995 to assume his current position as the United Technologies Corporation Professor of Acoustics in the Graduate Program in Acoustics, and as Senior Scientist in the Applied Research Laboratory, both at Penn State. Professor Garrett is a fellow of the Acoustical Society of America and recipient of the Popular Science Magazine Award for Environmental Technology, the Helen Caldecott Award for Environmental Technology, the Rolex Award for Enterprise (environment category), and has been issued over two dozen patents.



State Department Profile - Dr. Steve Garrett served in the Bureau of East Asian and Pacific Affairs (EAP), where he worked closely with Bill Behn, another EAP science advisor, and Phil Hopke, another Jefferson Fellow, to created an Improved Cook Stoves Initiative. Specifically, Dr. Garrett and his colleagues developed policy and programs to mitigate non-CO<sub>2</sub> contributions to global warming and improve women and children's health by trying to reduce the products of incomplete combustion created by biomass-burning cook stoves through technical innovation of scientist and engineers in the US and in ASEAN countries. To support these innovations, Dr. Garrett and his office worked with a coalition of other State Department bureaus, U.S. government agencies, NGOs, and commercial manufacturers. They organized seminars on biomass cook stoves at State to inform and educate the aforementioned parties and other interested groups, and held several other meetings at individual agencies with interest and expertise in this area. The next milestone in the Cook Stove Initiative will be the US-ASEAN Next-Generation Cook Stove Workshop in Bangkok in November 2009. That Workshop is co-sponsored by the State Department and the National Science Foundation. One option that will be explored at the Workshop will be the use of a small fraction of cook stove's heat to generate electricity that can be used to power a fan to improve combustion and provide excess power for high-efficiency lighting and to charge small electrical devices like cell 'phones. Dr. Garrett also spent time working on increasing US interactions with the ASEAN University Network and worked with Rob Butera, another Jefferson Fellow, to augment the ESTH Tradecraft Course that prepares Foreign Service Officers to serve in embassies as Environment, Science, Technology and Health (ESTH) specialists.

## Jefferson Science Fellows 2004–2017

### STEVEN GEARY

Department of Pathobiology and Veterinary Science, University of Connecticut

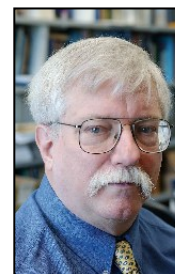


*Bio* - Dr. Steve Geary received his Ph.D. in Bacteriology in 1980 from the University of Connecticut. He was a Postdoctoral Fellow in the Department of Microbiology at the University of Missouri School of Medicine from 1980-1981. He then took a position as Principal Scientist at the Elkhorn Research Center of Schering Corporation in Omaha, Nebraska from 1981-1985. He then joined Bionique Laboratories in Saranac Lake, New York as Director of Research & Development. In 1989, Dr. Geary joined the faculty of the Department of Pathobiology & Veterinary Science at the University of Connecticut where he is currently Professor & Director of The Center of Excellence for Vaccine Research (CEVR). CEVR is built on research expertise in the studies of molecular microbiology, elucidation of disease mechanisms, immune responses to pathogenic microbes, and the development of vaccines and diagnostics specific for bacterial and viral diseases affecting poultry, cattle and swine. Dr. Geary's research focuses on investigating the mechanisms of pathogenesis of *Mycoplasma* species affecting animals and man and is internationally recognized as a leader in the field of *Mycoplasma gallisepticum* virulence and comparative and functional genomics. He is currently a 2008-2009 Jefferson Science Fellow in the Bureau of Verification, Compliance and Implementation, Office of Biological Weapons Affairs at the Department of State.

*State Department Profile* - Dr. Steve Geary spent his tenure in the Bureau of Verification, Compliance and Implementation within the Office of Biological Weapons Affairs focusing on technologies for the rapid detection of suspect biological weapons agents. Specifically, Dr. Geary led an effort to implement a new Pathogen Strain Library, a database of forensically-important pathogens, as well as developing a novel proposal to implement an analytical system for bioweapons. Additionally, Dr. Geary represented the State Department in the interagency group, "Strengthening Laboratory Biosecurity in the United States," which addressed security issues around theft, misuse, and diversion to unlawful activity of biological select agents. Finally, Dr. Geary worked with a number of other bureaus and offices within the State Department, as well as other U.S. government agencies on special projects related to biological weapons research.

### PHILIP K. HOPKE

Department of Chemical and Biomolecular Engineering, Clarkson University



*Bio* - Dr. Philip Hopke is the Bayard D. Clarkson Distinguished Professor at Clarkson University and the Director of the Center for Air Resources Engineering and Science. Professor Hopke received his B.S. in Chemistry from Trinity College (Hartford) and his M.A. and Ph.D. degrees in chemistry from Princeton University. After a post-doctoral appointment at M.I.T., he spent four years as an assistant professor at the State University College at Fredonia, NY. Dr. Hopke joined the University of Illinois at Urbana-Champaign, rising to the rank of professor of environmental chemistry, and subsequently came to Clarkson in 1989 as the first Robert A. Plane Professor with a principal appointment in the Department of Chemistry. He moved his appointment to the Department of Chemical and Biomolecular Engineering in 2000 and accepted his current appointments in 2002. His research interests are characterization of the ambient aerosol including development of sampling, analysis, and data analysis tools.

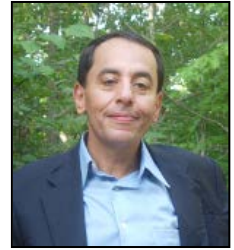
*State Department Profile* - Dr. Phillip Hopke worked in the Bureau of Intelligence and Research focusing his work on climate change and the potential for rapid progress on global warming through controls of black carbon particle, methane, and ozone-precursor emissions. Dr. Hopke assisted in carrying out the Improved Cook Stove Initiative, which was a cooperative effort to examine the needs and potential technologies for improved cook stoves in developing countries, which could dramatically impact air quality and public health in those countries while also helping to restore the global climate. Part of this project included educational seminars for the State Department, other U.S. government agencies, and non-government agencies on the issue. A major milestone in the Cook Stove Initiative was the ASEAN – US Next-Generation Cook Stove Workshop in Bangkok in November 2009.



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### MOHAMMED A. ZIKRY

Department of Mechanical and Aerospace Engineering, North Carolina State University



*Bio* - Dr. Mohammed Zikry is a Professor at North Carolina State University in the Department of Mechanical and Aerospace Engineering. His research interests are in computational modeling of systems ranging from the nano to the micro scales, fracture mechanics, plasticity, functional nano and micro device design, and experimental mechanics. He has received the Senior Research Fulbright Award, the ALCOA Distinguished Research Award, Merit Research Award (NCSU), and the Ralph Teeter Research Award from the Society of Automotive Engineering. He has been awarded a Professeur, Premiere Classe, Strasbourg University, and he is also a Fellow of the American Society of Mechanical Engineering (ASME), the Regional Editor for Mechanics of Materials, and is a member of the Executive Committee of ASME's Material's Division. He has been a senior research advisor to the Army Research Office and a consultant to numerous industries. He received his Ph.D. from the University of California, San Diego, his M.S. from the Johns Hopkins University, and his B.S. from the University of Kansas.

*State Department Profile* - Dr. Mohammed Zikry spent his tenure in the Africa Bureau, where he was part in the U.S. government efforts to stem the use of illicit minerals in spawning conflicts. Specifically, he worked to ensure that the Kimberly Process for Rough Diamonds is implemented, worked with international monitoring groups to visit alluvial mining sites, assisting with statistical analysis and management, and was a member of U.S. delegations to plenary and working group meetings. Additionally, Dr. Zikry worked with the U.S. Geological Survey and NASA to utilize remote sensing and satellite imagery techniques to monitor mining activity. Further activities that Dr. Zikry was involved in include his involvement with U.S. government efforts to stem illicit mineral activity in the eastern part of the Democratic Republic of Congo, strategy development and research initiatives for climate change and renewable energy in Sub-Saharan Africa and academic network development between American and African universities. As part of developing these research networks, he has been working with the Sullivan Foundation and other government agencies to plan for their Science and Technology activities at the Sullivan Foundation Summit in 2010. Since his tenure at the State Department, Dr. Zikry has been working with the Africa Bureau in the areas of the Kimberley Process, Conflict Minerals in the Congo, and research exchanges with Africa. One of the accomplishments in late 2009 was the formation of an international subgroup of scientists that will be formed to research whether the geological origin of diamonds can be easily determined, the results of which could prevent diamonds and other materials from being used to finance conflicts.

### # 2007-2008 Fellows #

### JANAKI R.R. ALAVALAPATI

Department of Forest Resource Economics and Policy, University of Florida



*Bio* - Dr. Alavalapati has two masters degrees (Botany and Forestry) from India and a masters in Rural Sociology and a PhD in Forest Resource Economics from Canada. He explores market solutions to natural resources, environmental, and energy conservation problems at local, regional, national, and international level. Before joining the University of Florida, he served as a forest officer in India; a Visiting Assistant Professor at the University of Alberta; and a Resource Economist at the Canadian Forest Service. Dr. Alavalapati was a consultant to the Forest Management Trust and Chemonics International, Inc. (USA) and the International Institute for Environment and Development (UK). Dr. Alavalapati has published over 150 books, book chapters, and refereed and non-refereed articles. Currently he is the Director of Conserved Forest Ecosystems: Outreach and Research, the elected chair of Economics, Policy, and Law Working Group of the Society of American Foresters, and a member of the Editorial Board of Forest Policy and Economics. Dr. Alavalapati's awards and honors include Indian Forester Prize, Canadian International Development Agency Fellowship, T.W. Manning prize (Canada), IFAS/UF Graduate Teacher/Advisor of 2003-2004, Stephen Spurr Award by the Florida Division of the Society of American Foresters, and University of Florida Research Foundation Professorship.

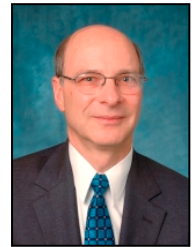
## Jefferson Science Fellows 2004–2017

State Department Profile - Dr. Alavalapati served as Senior Advisor for International Energy Affairs within the Office of the Special Advisor for Energy to the Secretary of State, where he helped develop and expand a series of bilateral, multilateral, and interagency renewable energy initiatives. He attended and contributed to a number of high-level meetings as a member of the U.S. delegation, including the World Food Security: The Challenges of Climate Change and Bioenergy conference in Rome, U.S.-Brazil bilateral biofuels discussions, the Global Bioenergy Partnership and International Biofuels Forum, and the Washington International Renewable Energy Conference. Dr. Alavalapati was directly involved in recruiting and working with experts for the Market Adoption and Deployment (MAD) themes for the Washington International Renewable Energy Conference. He also delivered a series of science based sustainable bioenergy lectures to international NGOs, U.S. government agencies, and private sector organizations.

### ROSS B. COROTIS

Department of Engineering, University of Colorado at Boulder

Bio - Corotis has research interests in the application of probabilistic concepts and decision perceptions for civil engineering problems, and in particular to societal tradeoffs for hazards in the built infrastructure. With degrees from MIT, he was on the faculty at Northwestern University, established the Department of Civil Engineering at The Johns Hopkins University and was Dean of the College of Engineering and Applied Science in Boulder. He has numerous research, teaching and service awards, chaired several committees on structural safety for ASCE and ACI, served on the steering committee of the National Academies Disasters Roundtable, chaired the NRC Assessment Panel for the NIST Building and Fire Research Laboratory, was Editor of the international journal Structural Safety, and chaired the Executive Committee of the International Association for Structural Safety and Reliability. He is the author of more than 190 publications, and the Editor of the ASCE Journal of Engineering Mechanics. Recently he was elected Vice-Chair of Section 4 of the NAE.



State Department Profile - Dr. Corotis served as the Science Officer for the Office of UNESCO Affairs in the Bureau of International Organizations. In this role, he wrote numerous position papers and responses to proposed UNESCO strategies that provided the USG position on UNESCO science matters. Dr. Corotis also represented the U.S. government at a variety of conferences around the world, including the UNESCO Biennial General Conference, the UNESCO Executive Board, and the UN Economic and Social Council. Dr. Corotis coordinated the U.S. submission of a proposal to UNESCO for a Category II Water Center, which would be the first of its kind, and organized a Water Forum at the Department of State in collaboration with the National Science Foundation, U.S. Geological Society, and the International Hydrological Programme.

### ELSA GARMIRE

Department of Engineering Sciences, Dartmouth College

Bio - Dr. Garmire is Sydney E. Junkins Professor of Engineering Sciences. She received her A.B. at Harvard and her Ph.D. at M.I.T., both in physics. After post-doctoral work at Caltech, she spent 20 years at the University of Southern California, where she was eventually named William Hogue Professor of Electrical Engineering and director of the Center for Laser Studies. She came to Dartmouth in 1995, where she served 2 years as dean of Thayer School of Engineering. In her technical field of quantum electronics, lasers and optics, she has authored over 250 journal papers, obtained nine patents, and been on the editorial board of five technical journals. She has supervised 30 PhD theses and 14 MS theses. Garmire is a member of the National Academy of Engineering, serving presently on its Governing Council, and the American Academy of Arts and Sciences. She is fellow of the Institute of Electrical and Electronic Engineers, the American Physical Society, and the Optical Society of America, of which she was president in 1993. She has served on the boards of three other professional societies. In 1994 she received the Society of Women Engineers Achievement Award. Garmire has been a Fulbright senior lecturer and a visiting faculty member in Japan, Australia, Germany, and China. She chaired the NSF Advisory Committee on Emerging Technology and served on both the NSF



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Advisory Committee on Engineering and the Air Force Science Advisory Board. She teaches two courses at Dartmouth on Technology Literature.

State Department Profile - Dr. Garmire was advisor to the Bureau of Economics, Energy and Business under the U.S. Coordinator for International Communications and Information Policy. In this capacity, she reviewed U.S. telecommunications policies, provided analysis and recommendations to the U.S. coordinator and U.S. delegations, identified and developed policy initiatives for international strategy, and represented U.S. information and communications technology policies in interagency, academic, and private sector meetings. Additionally, Dr. Garmire participated in conferences and workshops such as the World Radio Conference, OECD's Ministerial Meeting, U.S.-India ICT Working Group, and the West Africa ICT Road Map to Opportunities, among many others, and presented a series of seminars to teach the technology of telecommunications to U.S. officers with the goal of establishing a strong knowledge/resource base for information and communications technologies within the U.S. Department of State.

### PURUSOTTAM JENA

Department of Physics, Virginia Commonwealth University

Bio - Dr. Jena received his early education in Utkal University, India leading to Bachelor of Science in Physics in 1964 and Master of Science in Physics in 1966. After completing his Ph. D. degree in Physics at the University of California at Riverside in 1970, he held postdoctoral appointments at a number of U.S. universities. With the exception a year from 1986-87 when he assumed the position of Program Director at the Materials Science Division of the National Science Foundation, Dr. Jena has remained on the faculty of Virginia Commonwealth University since 1980. Dr. Jena's research covers a wide range of topics in condensed matter, atomic, and molecular Physics. These include electronic structure of metals, semiconductors, superconductors, alloys, and liquid metals; point and complex defects; surfaces and thin films, atomic clusters and cluster assembled materials, nanoscience and technology. His current research involves three major areas: nanoclusters and cluster based materials, alternate energy, and spintronics. Dr. Jena is the author of more than 360 papers including editor of 10 conference proceedings. He has given over three hundred invited talks in international conferences and academic institutions in nearly 25 countries around the world. He has organized more than thirty international conferences and has served as member of scientific panels for the National Science Foundation, Department of Energy, and Army research Office.



State Department Profile - Dr. Jena worked extensively on the Washington International Renewable Energy Conference (WIREC) organized by the Bureau of Oceans, Environment, and Science. He was in charge of coordinating the R&D sessions for the WIREC conference, a high-level gathering with over 9000 participants, for which he recruited speakers, panelists and moderators from academia, industry, and government laboratories. Following the conference Dr. Jena edited a conference report that was distributed worldwide. An abridged version of this report, emphasizing R&D needs in renewable energies, has appeared in a number of scientific and engineering bulletins and journals. Dr. Jena also proposed and developed ideas for U.S. regional partnerships on renewable energies, focusing the initial strategies on Nordic countries, followed by South American countries and consulted the National Science Foundation and the Department of Energy for their support. Dr. Jena plans to stay involved with this initiative, as well as to advance Virginia Commonwealth University's involvement with public policy and the State Department.

### MARVIN PAULE

Department of Biochemistry, Colorado State University

Bio - Dr. Paule earned his Doctorate from UC Davis in 1970 and is currently Professor and former Chair of Biochemistry and Molecular Biology at Colorado State University. Dr. Paule researched the structures of eukaryotic RNA polymerases and the expression of ribosomal RNAs in eukaryotic cells, making seminal discoveries of transcription and regulation mechanisms of





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these genes. Eighty original scientific papers, reviews, and two books were published. Nearly 40 graduate students and postdoctoral fellows trained in his laboratory. This research was funded continuously by NIH for 33 years. Paule organized numerous international scientific conferences, including originating the field's premier "Oddpols meeting," the biannual Asilomar Conference on RNA Polymerase I and III Transcription. Two yearlong sabbaticals in France led to continuing collaborations with scientists at French research institutes. He previously served as Chair of the Cell and Molecular Biology Graduate Program, three terms on NIH Study Sections and as Co-Chair of the Federal Demonstration Partnership. He recently received the CSU Alumni Association Best Teacher and the CSU Distinguished Service awards.

State Department Profile - Dr. Paule worked in the Verification, Compliance and Implementation Bureau, Office of Biological Weapons Affairs. He spent much of his time monitoring compliance with provisions of the Biological Weapons Convention and writing a Noncompliance Report. The report, which also includes sections on chemical, nuclear, and radiological weapons development and conventional weapons deployment, was then used by government officials to create foreign policy and to adjust domestic laws, as well as by Congress to amend the U.S. position toward other countries. Additionally, Dr. Paule developed a proposal to create a comprehensive genome sequence database to aid in identifying strains of pathogens used in biological weapons. He attended the Higher Education Summit for Global Development sponsored by DOS and USAID, and plans to speak at a follow-up conference to the Summit in Tbilisi, Georgia.

### JERRY PETERSON

Department of Physics, University of Colorado at Boulder

Bio - After receiving his undergraduate (1961) and graduate (1966) degrees in Physics at the University of Washington, he was an instructor at Princeton University and on the research faculty at Yale University. His research interests have covered many arenas of nuclear physics, including nuclear astrophysics, nuclear reactions, nuclear fission, and applications of nuclear reactions to computer memory elements. These experimental studies have used beams from a wide variety of particle accelerators, most often involving foreign collaborators. He has been a visiting professor at the University of Copenhagen (Niels Bohr Institute), the University of Tokyo, and the Federal University of Rio de Janeiro. He is a Foreign Fellow of the Pakistan Academy of Sciences and a Fellow of the American Physical Society. Professor Peterson is also a member of the faculty in the UCB Program in International Affairs. His recent teaching has included classes in Physics, Environmental Studies, Journalism and International Affairs.



State Department Profile - Dr. Peterson worked as an analyst in the Office of Economic Analysis of the Bureau of Intelligence and Research, where he focused on energy and the environment with an emphasis on coal and nuclear energy. Based on his research and analyses, Dr. Peterson wrote assessments, memos, and papers on the aforementioned issues and presented briefings and seminars to U.S. officials and to the associated intelligence community. Dr. Peterson also created an informal seminar group for State officials concerned with nuclear matters, holding tutorials and bringing in high-level visitors. As a result of this seminar group and Dr. Peterson's other efforts, there was an increase in collaboration of ideas and understanding of and sophistication in addressing energy matters throughout the Office.

### SYED S.H. RIZVI

Institute of Food Science, Cornell University

Bio - Dr. Rizvi is Professor of Food Process Engineering and International Professor of Food Science. He has a Ph.D. from Ohio State University, a M. Eng. (Chemical Engineering) from the University of Toronto and a B. Tech. from Panjab University, India. He teaches courses related to engineering and processing aspects of food science and role of food processing and value addition in international development. His teaching has been recognized by several awards, including the SUNY Chancellor's Award for Excellence in Teaching and the Cornell College of Agriculture and Life





## Jefferson Science Fellows 2004–2017

Sciences Professor of Merit Award. Dr. Rizvi's research focuses on experimental and theoretical aspects of supercritical fluid processes, extrusion, physical and engineering properties of biomaterials and other novel food processing and value addition technologies. He is a co-author/editor of six books and over one hundred research publications, holds seven U.S. patents and serves on the editorial board of several journals. Professor Rizvi is a Fellow of the Institute of Food Technologists and was awarded the prestigious Marcel Loncin Research Prize for his research in food process engineering. He also received the International Research Award in Dairy and Food Processing.

State Department Profile - Dr. Rizvi worked for the Bureau of Economic, Energy and Business Affairs, Office of Agriculture, Biotechnology and Textile Trade Policy (EEB/TPP/ABT). In this role, he conducted and attended meetings on food and agro-processing's role in economic development and food security, focusing on developing countries. These meetings included interagency discussions with U.S. Department of Agriculture-Foreign Agricultural Services, the U.S. Trade and Development Agency, the Food and Drug Administration, and the Commerce Department, the World Food Prize event, dialogues with PEPFAR, the Washington International Renewable Energy Conference, the Higher Education Summit for Global Development, and many others. Dr. Rizvi also delivered technical talks at many places, including the U.S. Department of Agriculture-Cooperative State Research, Education, and Extension Service, Benaras Hindu University, the International Conference on Engineering and Food in Chile, the Council of Scientific and Industrial Research in Ghana, and the Ministry of Food Processing Industries in India. Dr. Rizvi urged the State Department to increase its participation in food and agro-processing sector activities and helped organize an event at the Institute of Food Technologists meeting as a way to initiate their engagement.

### JOHN YEH

Department of Obstetrics and Gynecology, Harvard University

Bio - Dr. Yeh received his A.B. from Harvard, his M.D. from the University of California, San Diego, and completed his residency, reproductive endocrinology and infertility fellowship and postdoctoral fellowship at Harvard Medical School. He has served on the faculties of Harvard Medical School and the University of Minnesota. Dr. Yeh's research interest is in ovarian reproductive aging, corpus luteum regression, and biomarkers of chemotherapy induced ovarian damage. He has authored or coauthored over 200 journal articles, book chapters, letters, and conference proceedings. He directs one of the largest obstetrics-gynecology residencies in the country. Dr. Yeh has been awarded the Excellence in Teaching Award by the Association of Professors of Gynecology and Obstetrics, the Outstanding Professor Award by the American College of Obstetricians and Gynecologists (District II), and the Sustained Achievement Award by the University at Buffalo. He is a Fellow of the American College of Obstetricians and Gynecologists, an examiner for the American Board of Obstetrics and Gynecology and is a member of the Society for Gynecologic Investigation, the American Society for Reproductive Medicine, and the American Society for Cell Biology.



State Department Profile - Dr. Yeh worked in the Global Health Bureau at the U.S. Agency for International Development. He concentrated on strengthening policies and programs in maternal and child health to increase collaboration between USAID, individual countries, and international organizations, to develop practices to improve mortality rates, and to develop health system infrastructures. Dr. Yeh toured a number of programmatic countries, such as Switzerland, Turkey, Ghana, and India, during his work on these programs. Additionally, Dr. Yeh concentrated some of his time on U.S. government inter-agency cooperation by serving on advisory committees that are expected to result in new joint efforts in science, research, and education. Dr. Yeh plans to continue to serve as a consultant for a WHO multicenter study and on USAID advisory committees on maternal health projects.

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## # 2006 – 2007 Fellows #

### **OSAMA AWADELKARIM**

Department of Engineering Science and Mechanics, Penn State University

*Bio* - Dr. Awadelkarim is Professor of Engineering Science and Mechanics and the Associate Director for the Center of Nanotechnology Education and Utilization at The Pennsylvania State University. Dr. Awadelkarim received his B.S. in Physics from the University of Khartoum, Sudan, and his Ph.D. from Reading University in the UK. Prior to joining Penn State, Dr. Awadelkarim worked as a Research Scientist at Linkoping University and the Swedish Defense Research Establishment. His research interests are in electronic materials, nano/microelectronics, and nano/microelectromechanical systems. Dr. Awadelkarim has authored/coauthored nearly 200 journal articles, book chapters, books, and conference proceedings. He is a recipient of Shell and the University Prizes from the Sudan, and Fellowships from the International Seminars in Physics and Chemistry (Sweden) and the International Center for Theoretical Physics (Italy).



*State Department Profile* - Dr. Awadelkarim worked in the Office of Public Diplomacy and Public Affairs at the Bureau of African Affairs (AF/PDPA) and the Office of Science and Technology Cooperation in the Bureau of Oceans and International Environmental and Scientific Affairs (OES/STC). Dr. Awadelkarim's assignment in the two offices was to promote interaction and collaboration between African, Arab, and Moslem scientists and scientists in the U.S. He presented talks and seminars at various scientific meetings and workshops in African and Islamic countries and developed a number of science and technology agreements between U.S. government agencies and their African and Islamic counterparts.

### **KIM BOYER**

Rensselaer Polytechnic Institute

*Bio* - Dr. Kim Boyer is Head of the Department of Electrical, Computer, and Systems Engineering at Rensselaer Polytechnic Institute. He received the BSEE (with distinction), MSEE, and Ph.D. degrees, all in electrical engineering, from Purdue University in 1976, 1977, and 1986, respectively. From 1977 through 1981 he was with Bell Laboratories, Holmdel, NJ; from 1981 through 1983 he was with Comsat Laboratories, Clarksburg, MD. From 1986-2007 he was with the Department of Electrical and Computer Engineering, The Ohio State University. He is a Fellow of the IEEE, a Fellow of IAPR, and a former IEEE Computer Society Distinguished Speaker. Dr. Boyer's research interests include all aspects of computer vision and medical image analysis, including perceptual organization, structural analysis, graph theoretical methods, stereopsis in weakly constrained environments, optimal feature extraction, large modelbases, and robust methods. His current research activities include mapping the surface of the dynamic prelens tear film from interferometric video and intelligent illumination control for phototoxicity mitigation in live cell imaging. Dr. Boyer is Treasurer of the International Association for Pattern Recognition, as well as a US delegate to the Governing Board. He is a former Associate Editor of IEEE Transactions on Pattern Analysis and Machine Intelligence, Area Editor of Computer Vision and Image Understanding, Associate Editor of Machine Vision and Applications, Chair of the first two IEEE Computer Society Workshops on Perceptual Organization, was a charter member of the DARPA IUE Technical Advisory Committee, and was a member of the initial ORD RADIUS Technical Oversight Committee. Dr. Boyer has published five books and more than 100 scientific papers. He has lectured in nearly 30 countries around the world.



*State Department Profile* - Dr. Boyer served as Senior Science Advisor to the Bureau of Western Hemisphere Affairs, working in the Office of Democracy, Regional Markets, and Integration and coordinating with the Office of the Science and Technology Adviser. He worked with representatives from Brazil, Chile, Argentina, and Peru to develop scholar exchange programs, studied the relationship between innovation in science and engineering and economic development, examined possibilities for science and engineering as instruments of diplomacy in post-

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transition Cuba, and researched standards and codes necessary for biofuels to become internationally traded commodities. While at State he studied the impact of technological innovation on economic development in scientifically lagging and scientifically developing countries. He also developed policy recommendations for the use of science and engineering as instruments of diplomacy.

### CLAUDIO CIOFFI-REVILLA

Computational Social Science, George Mason University

*Bio* - Dr. Cioffi-Revilla is a computational social scientist with doctorates in quantitative political science and international relations. He specializes in conflict analysis and research methods, modeling, and simulation. He is currently Professor of Computational Social Science and founding Director of the Center for Social Complexity at George Mason University, Fairfax, Virginia. At GMU he established and directs a new Ph.D. program in Computational Social Science, the first graduate program of its kind specifically focused on CSS. His research has been funded by NSF, DARPA, and other agencies, including collaborative research with the National Museum of Natural History, Smithsonian Institution. Professor Cioffi has published numerous articles in leading journals and five books, including *Politics and Uncertainty* (Cambridge University Press, 1998) and *Power Laws in the Social Sciences*.



*State Department Profile* - Dr. Cioffi-Revilla served as Senior Science and Technology Advisor to the Director, INR/GGI, where he reviewed computational social method applications (measurement, models, simulations). The applications worked to solve intelligence analysis challenges facing senior State Department policymakers who are supported by the research and analysis conducted by the Office of The Geographer and Global Issues in the Bureau of Intelligence and Research. He participated in the production of an INR Assessment on Ethno-sectarian Segregation and helped the Director of the Office of WMD Terrorism by providing a model of risk assessment.

### PAUL DAVIS

Interdisciplinary and Global Studies, Worcester Polytechnic Institute

*Bio* - The distinctive Interdisciplinary and Global Studies program places student teams around the world to solve open-ended technical and social problems. WPI's twenty-two project centers range from Worcester to Wall Street and include sites such as the Silicon Valley, Hong Kong, Bangkok, Venice, Costa Rica, and Namibia. Each year nearly 500 WPI undergraduates—seventy percent of a graduating class—pursue off-campus projects. As an applied mathematician, Dr. Davis has written textbooks and developed software to support student-centered learning in mathematical modeling. His research interest is operation and control of electric power systems, and he has consulted for a number of corporations. He has served as Secretary of the Society for Industrial and Applied Mathematics (SIAM) and as Editor-in-Chief of *SIAM Review*. He received his Ph.D. in applied mathematics from Rensselaer Polytechnic Institute.



*State Department Profile* - Dr. Davis worked primarily in East Asian and Pacific Affairs, Office of Regional Security and Policy Affairs and additionally in Oceans, Environment, and Science, Office of Science and Technology Cooperation. The split assignment led to a proposed agreement for cooperation in science and technology between the U.S. and the Association of Southeast Asian Nations (ASEAN), a commitment of the Plan of Action for the Enhanced ASEAN-U.S. Partnership signed by Secretary Rice in July of 2006, which is the first of its kind for the U.S. He also developed a bilateral agreement for Malaysian-U.S. cooperation in science and technology.

### MICHAEL MAUEL

Applied Physics and Applied Mathematics, Columbia University

*Bio* - Dr. Mauel received his doctorate from MIT in 1983 and joined the faculty of Columbia University in 1985 where he is professor. Dr. Mauel's research specialty is high temperature



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plasma physics, and he explores plasma instability control and the application of space physics to laboratory confinement. Mauel was named Teacher of the Year at Columbia's School of Engineering and Applied Science, and was awarded the Rose Prize for Excellence in Fusion Engineering and a Certificate of Appreciation by the U.S. Department of Energy. Dr. Mauel is a fellow of the American Physical Society and served as Chair of the APS Division of Plasma Physics and on several advisory committees addressing fusion energy science, plasma physics, and education.

State Department Profile - Dr. Mauel served in the Office of International Energy and Commodity Policy assisting U.S. diplomatic efforts to promote energy security. In addition to reporting on energy technology developments, Mauel was a member of the team supporting the U.S. G8 Foreign Affairs Sous Sherpa at Heiligendamm, provided support for U.S. diplomatic activities involving the Extractive Industries Transparency Initiative (EITI), and was a member of Assistant Secretary Sullivan's delegation of during his energy and economic partnership consultations in Azerbaijan and Turkey.

### KATHERINE SELEY-RADTKE

Department of Chemistry and Biochemistry, University of Maryland, Baltimore County

Bio - Dr. Seley-Radtke earned a Ph.D. in Organic Chemistry from Auburn University, Her research involves drug discovery and development. Current research projects are focused in two areas: (i) the design and synthesis of nucleoside inhibitors of enzymes critical for replication, with a chemotherapeutic emphasis in the areas of anticancer, antiviral, and antiparasitic targets, and (ii) the use of modified nucleosides and heterocycles to explore structure and function in DNA and other biological systems. In addition to her research efforts, for the past five years Dr. Seley-Radtke has been involved with the Department of Defense and the Defense Threat Reduction Agency's collaborative effort with Russia towards the nonproliferation of biological weapons.



State Department Profile - Dr. Seley-Radtke worked in the Office of Cooperative Threat Reduction, part of the Bureau of International Security and Nonproliferation. She focused on two major projects: building biosafety and biosecurity laboratory capacity in Southeast Asia and providing an assessment of the rapidly changing landscape for science policy in Russia. As an extension of this latter project Dr. Seley-Radtke spent two additional months at the U.S. Embassy in Moscow, providing support and expertise for science and technology initiatives in Russia.

## # 2005 – 2006 Fellows #

### WILLIAM S. HAMMACK

Chemical Engineering, University of Illinois at Urbana-Champaign

Bio - Hammack is a professor of Chemical and Biomolecular Engineering. Every week for the last couple of years Hammack has produced an essay focusing on common articles found in everyday life. In this program, called *Engineering & Life*, he's described, for example, how the invention of Velcro was inspired by a walk in the woods that left an engineer's socks covered with burrs. He has a B.S. in chemical engineering from Michigan Technological University, and a M.S. and Ph.D from the University of Illinois. He taught engineering at Carnegie Mellon University before returning to Illinois in 1998. Bill has received the American Institute of Physics Science Writing Award. He has also received the IEEE Award for Literary Contributions Furthering the Public Understanding of the Profession. He's been recognized by the American Chemical Society's Grady-Stack Award; the American Society for Engineering Education's President's Award, the National Federation of Community Broadcasters Silver Reel for National News & Commentary, the National Association of Science Writers Science-in-Society Award, among many others.



State Department Profile – Dr. Hammack worked with the Office of Nuclear Energy, Safety and Security in the Bureau of International Security and Nonproliferation (ISN). He acted as State liaison to four Department of Energy



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(DoE) programs: the Reduced Enrichment for Research and Test Reactors (RERTR) program; the U.S. origin spent fuel return program; the Russian origin spent fuel return program; and the “gaps program.”

### JAMES HARRINGTON

Material Science and Engineering, Rutgers University

*Bio* - Dr. Harrington is currently a Professor of Ceramic Science & Engineering in the Fiber Optic Materials Research Program. He has over thirty years of research experience in the area of optical properties of solids. Since 1977, he has worked on all aspects of infrared fibers including fabrication, characterization, and applications. He is generally recognized as one of the world's leading experts in this continually evolving field. His current research interests include the development of fiber optics for use in the delivery of laser power in surgical and industrial applications and for use as chemical and thermal fiber sensors. He graduated with a BA in Physics from Grinnell College, and with an M.S. and Ph.D in Physics from Northwestern University.



*State Department Profile* - Dr. Harrington worked with the Bureau of International Security and Nonproliferation (ISN) on the control of dual-use goods and technologies by the 40 countries participating in the Wassenaar Agreement (WA). Dr. Harrington provided technical advice to the Conventional Arms and Threat Reduction Office within ISN that is responsible for conducting negotiations with the participating states of the WA. Additionally, he chaired several technical working groups charged to develop U.S. proposals for the WA expert group.

### ALEXANDER KING

Ames Laboratory

*Bio* - Dr. King is the director of the U.S. Department of Energy's Ames Laboratory Director at Iowa State University. Prior to becoming Ames Laboratory director, King served as professor and head of the School of Materials Engineering at Purdue University, a position he'd held since 1999. Prior to that, he was a member of the faculty of the Department of Materials Science and Engineering at the State University of New York at Stony Brook, from 1981 to 1999. King also served as Vice Provost for Graduate Studies at Stony Brook from 1987 to 1992. King received a bachelor's degree (1975) in physical metallurgy from the University of Sheffield, England, and a doctorate in metallurgy and the science of materials from the University of Oxford in 1979. In 2007, King was a distinguished lecturer in materials science and engineering at ISU. King is an editor of four books and has published 108 journal articles and 145 refereed conference proceedings, book chapters, extended abstracts, book reviews and other short contributions. He has given more than 100 presentations at conferences, symposia and colloquia around the world. King's professional service includes membership on numerous committees for national and international symposia and committees.



*State Department Profile* - Dr. King worked with the Bureau of African Affairs, where he took on the role of science advisor for the Bureau. He strived to encourage the development of science and technology expertise in sub-Saharan Africa as a means to facilitate economic development, contributing on subjects as diverse as the tracking of conflict diamonds, tracking illicit mineral ore trading, remediation of “exploding lakes,” intellectual property issues, and the development of geothermal energy in the African Rift Valley.

### MICHAEL PRATHER

Earth System Science, University of California, Irvine

*Bio* - Dr. Michael J. Prather is the Fred Kavli Chair and Professor, and director of the UCI Environment Institute which studies how the environment and society interact. Previously, he was a program manager at NASA HQ for seven years, and an adjunct professor at Columbia University. He has undergraduate degrees in Mathematics from Yale and in Physics from Oxford,



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as well as a Doctorate in Astronomy and Astrophysics from Yale. Prather is a member of the Norwegian Academy of Science and Letters, a fellow of the AGU and AAAS. He won the UCI Lauds & Laurels Faculty Award in 2008, and is the Editor-in-Chief of *Geophysical Research Letters*.

State Department Profile - Dr. Prather worked in the State Department's Bureau of Intelligence and Research on global science and environmental issues, providing a link between the intelligence community and the policy bureaus. He initiated and drafted assessments of current knowledge on hurricanes, illegal logging, and climate change. Dr. Prather also traveled to the embassies of Costa Rica and Brazil to work with the regional science and technology officers and planned a conference on the role of disaster risk management.

### EDWARD SAMULSKI

Chemistry, University of North Carolina at Chapel Hill

Bio - Dr. Samulski works principally on nanotechnology issues, including molecular and macromolecular structure, dynamics, and orientational order in soft condensed matter. For low-molar-mass materials this includes plastic crystals and liquid crystals (LCs). In the case of macromolecules he studies solid and semi-solid phases-glasses, rubbery elastic networks, semi-crystalline and liquid crystalline polymers, isotropic melts and solutions of both synthetic and biological macromolecules. He received his Ph.D. from Princeton University, Ph.D. He was a member of the faculty at University of Connecticut from 1972 to 1987. Dr. Samulski has been a fellow of the American Physical Society, the American Association for the Advancement of Science, Simon Guggenheim, and received the Stone Award of the Carolina Piedmont Section of the ACS.



State Department Profile - Dr. Samulski worked principally on nanotechnology issues and divided his time between the Bureau of Intelligence and Research (INR) and the Office of the Science and Technology Adviser to the Secretary (STAS). In INR he assessed nanotechnology progress in Asia, attempting to separate hype from fact. In STAS, he helped organize two trans-Atlantic scientific conferences, both on health and nanotechnology – the first focused on therapeutic advances, and the second on the societal and institutional ramifications of nano-product development and application.

## ✦ 2004 – 2005 Fellows ✦

### JULIAN ADAMS

Ecology and Evolutionary Biology, University of Michigan

Bio - Dr. Adams' laboratory studies a range of problems in the population genetics and evolution. Current projects concern the molecular and biochemical analysis of the process of adaptation in microbial populations. Dr. Adams also has interests in human population genetics, he is currently working with the genetic and demographic structure of human isolates. Dr. Adams received his Ph.D. from the University of California at Davis. He has held visiting appointments at universities in Brazil, France and Germany. In 1996 he received a Faculty Recognition Award by the University. He served as Chair of the Department of Biology from 1996-2001. He serves as Associate Editor for the journals *Molecular Biology and Evolution* and *Genetica* and was Chair of the 1997 Gordon Research Conference on Microbial Population Biology.



State Department Profile - Dr. Adams accepted a position with the Bureau of Economic Growth, Agriculture and Trade at the U.S. Agency for International Development (USAID/EGAT). His primary focus was the development and introduction of genetically-modified (GM) food crops to enhance agricultural production in developing countries; his contributions included drafting regulatory and policy frameworks for the conduct of field trials for GM crops. Dr. Adams' work in this area supported U.S. strategic foreign trade policy to promote exports of U.S.-developed GM crops and agricultural technology.

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### BRUCE AVERILL

*Bio* - Previous to his Jefferson Science Fellowship, Dr. Averill was a Distinguished University Professor of Chemistry at the University of Toledo. He also held positions at the University of Amsterdam, Jilin University in China, the University of Sydney, and the University of Virginia. Averill received a Ph.D. in Inorganic Chemistry from MIT and a B.S. in Chemistry from Michigan State University. He held two postdoctoral fellowships at the University of Wisconsin and Brandeis University.



*State Department Profile* - Dr. Averill worked in the Bureau of Western Hemisphere Affairs (WHA), focusing on the assessment of geothermal energy resources in Central and South America. He conducted a detailed study of available geothermal sites, technologies used to exploit geothermal resources, public and private financing mechanisms used to develop geothermal power, mechanisms to address safety and environmental concerns, and energy policies associated with development of geothermal resources. His findings provided significant input to WHA's energy strategy.

### MELBA CRAWFORD

School of Civil Engineering, Purdue University

*Bio* - Dr. Crawford is currently the Interim Associate Dean of Engineering for Interdisciplinary Research, as well as the Director of the Laboratory for Applications of Remote Sensing, Professor of Agronomy, Civil and Electrical and Computer Engineering, and Chair of Excellence in Earth Observation all at Purdue University. Dr. Crawford's research interests include studying the methods in statistical pattern recognition for high dimensional data analysis, data fusion techniques for multisensor problems, multiresolution methods in image analysis, and knowledge transfer in data mining. She has a Ph.D. in Industrial and Systems Engineering from Ohio State University and an M.S. in Civil Engineering and a B.S. in Civil Engineering both from the University of Illinois - Urbana-Champaign.



*State Department Profile* - Crawford divided her time between the International Organization Affairs Bureau (IO) and Intelligence and Research (INR). For IO, Dr. Crawford served as the Science Committee Coordinator for the U.S. National Commission to UNESCO. In this capacity, she advised the National Commission, and also the U.S. Mission to UNESCO in Paris, on U.S. priorities and objectives in re-establishing close linkages to the UNESCO science section. Dr. Crawford's principal focus with INR was disaster mitigation. In this role she was a delegate to the World Conference on Disaster Reduction in Kobe, Japan, and she took a leading role in U.S. efforts to establish a more effective tsunami early warning system for the Pacific Rim.

### DAVID EASTMOND

Environmental Toxicology, University of California, Riverside

*Bio* - Eastmond's research focuses on the mechanisms involved in the toxicity and carcinogenesis of environmental agents. One important goal of this research is to allow adverse health effects associated with chemical exposure in human populations to be more accurately estimated. Eastmond graduated from Brigham Young University with a B.S. in Zoology and an M.S. in Entomology, and from UC Berkeley with a Ph.D. in Environmental Health Sciences. His postdoctoral work was at the Lawrence Livermore National Lab in Livermore, CA. Eastmond served as President of the Environmental Mutagen Society from May 2003 to October 2004, as the chair of the Environmental Toxicology Program at the University of California, Riverside from 1999 to 2004, and is currently a Council Member on the National Council on Radiation Protection and Measurements.



*State Department Profile* - Dr. Eastmond worked in the Bureau of European Affairs (EUR), where he was the bureau's principal advisor on EU chemicals regulation policy. In this capacity, he was a member of the EPA

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delegation to Brussels for negotiations on formulation and harmonization of chemical regulation policy. He also provided expert scientific analysis of proposed EU chemicals legislation, and worked closely with EPA, OMB, and FDA to develop avenues for greater US/EU collaboration on regulation of genetically-modified agricultural crops.

### **KALIDAS SHETTY**

Microbiology and Food Safety, University of Massachusetts, Amherst

*Bio* - Professor Shetty's teaching focuses on food biology, food biotechnology, functional foods, and world food habits. His research centers in biotechnology and the metabolic biology of functional foods, and more specifically on innovative advances in ingredient biosyntheses, food safety, nutrition, functional foods, and the environmental adaptation of biological systems. He graduated from the University of Idaho with a Ph.D. in Microbiology and an M.S. in Bacteriology, and from the University of Agricultural Sciences in Bangalore, India with a B.S. in Agricultural Science. His postdoctoral training was at the National Institute of Agro-Biological Research in Japan and at the University of Guelph, Ontario, Canada. He has three published books, many published articles, and several awards in the field of food biology in both the United States and abroad.



*State Department Profile* - Dr. Shetty worked with the Bureau of Economic and Business Affairs (EB), where he focused his efforts on promotion of U.S. agricultural biotechnology. He acted as adviser on intellectual property pertaining to genetically-modified crops, food safety issues such as BSE and soy rust, and agricultural terrorism, and he traveled extensively to present the benefits of agricultural biotechnology. He served as the State Department representative on the USG Interagency Working Group on Biotechnology Risk Assessment.