FULBRIGHT

International Fulbright Science & Technology Award

Capstone Seminar for 2007-2010 International Fulbright Science & Technology Fellows

Washington, D.C.
June 13–16, 2010

International Fulbright Science & Technology Award provides top international students in the sciences who have exhibited academic merit and leadership skills with the opportunity to pursue a Ph.D., and carry out cutting edge research in eligible scientific fields at the most prestigious programs and labs in the United States of America.

INTERNATIONAL FULBRIGHT SCIENCE & TECHNOLOGY AWARD

The Bureau of Educational and Cultural Affairs of the U.S. Department of State (ECA) sponsors the International Fulbright Science & Technology (Fulbright S&T) Award to provide exceptional foreign students with an opportunity to pursue Ph.D. level study at top U.S. university programs and labs. Fulbright S&T is designed to be the most prestigious international scholarship in the sciences, and to demonstrate the United States' commitment to welcoming top-notch future researchers and leaders to pursue serious scientific study and research at its institutions.

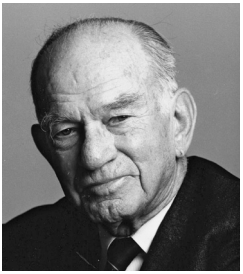
Fulbright S&T Fellows receive the first three years of funding from ECA followed by support from U.S. host institutions until the completion of their Ph.D. programs. During the 2009-2010 academic year, 108 S&T Fellows from three cohorts, representing 58 countries from all world regions, have been carrying out Ph.D. level study. Approximately 45 students are selected through a worldwide annual competition. They enroll in diverse fields at top U.S. universities. To be eligible for the program, nominees must apply from their country of citizenship, have a bachelor's degree and cannot be currently studying or living in the United States. Like all Fulbright Program participants, they must exhibit leadership skills and represent their culture in their host communities. Fulbright S&T Fellows must also demonstrate unique aptitude and innovation in scientific fields, return to their home countries, and make contributions to society using the scientific knowledge they gained while in the United States.

Fulbright S&T Fellows' benefits include three years of ECA funding with subsequent support until the completion of their Ph.D. provided by their U.S. host institutions. They also receive placement services, tuition, a housing allowance/stipend, book allowances, health/accident insurance coverage, international travel expenses, J-visa sponsorship. Specific benefits only available to Fulbright S&T Fellows include an enhanced research and lab allowance, a conference allowance that supports international travel, and tailored group enrichment activities.

Fulbright S&T fields include: Aeronautics and Astronomics, Agriculture (theoretical/research), Astronomy/Planetary Sciences, Biology, Chemistry, Computer Sciences, Energy, Engineering (aeronautical biomedical, chemical, civil, computer electrical, environmental, ocean, materials, mechanical, and petroleum); Environmental Science, Geology/Earth and Atmospheric Sciences, Information Sciences (Engineering focus), Materials Science, Mathematics, Neuroscience/Brain or Cognitive Sciences, Oceanography, Physics, and Public Health (theoretical/research).

For additional information, visit **www.scienceandtech.fulbrightonline.org** or contact the Program Officer, Vincent Pickett, at **PickettVS@state.gov**.

THE FULBRIGHT PROGRAM



The Fulbright Program is the flagship international educational exchange program sponsored by the U.S. government and is designed to increase mutual understanding between the people of the United States and the people of other countries. The primary source of funding for the Fulbright Program is an annual appropriation made by the U.S. Congress to the U.S. Department of State, Bureau of Educational and Cultural Affairs. Participating governments and host institutions, corporations and foundations in foreign countries and in the United States also provide direct and indirect support. Recipients of Fulbright grants are selected on the basis of academic or professional achievement, as well as demonstrated leadership potential in their fields. The Program operates in over 155 countries worldwide.

Since its establishment in 1946 under legislation introduced by the late U.S. Senator J. William Fulbright of Arkansas, the Fulbright Program has given approximately 300,000 students, scholars, teachers, artists, and scientists the opportunity to study, teach and conduct research, exchange ideas and contribute to finding solutions to shared international concerns.

Fulbright alumni have achieved distinction in government, science, the arts, business, philanthropy, education, and athletics. Forty Fulbright alumni from eleven countries have been awarded the Nobel Prize including chemists Osamu Shimomura from Japan, Israeli Aaron Ciechanover, Alan MacDiarmid from New Zealand and Lars Onsager, Robert Sanderson Mulliken, and Linus Pauling from the United States; Physics Nobel Prizes have been accepted by Riccardo Giacconi and Carlo Rubbia from Italy, Masatoshi Koshiba of Japan, Sweden's Hannes Alfven and William Alfred Fowler, Philip W. Anderson, Hans Bethe, Charles Hard Townes, Emilio Segre, Chen Ning Yang, and Felix Bloch from the U.S.; and five Nobel Prizes have been awarded to Fulbrighters in the field of medicine. Other notable alumni include Nobel Laureates Muhammad Yunus and former U.S. Secretary of State Henry Kissinger, Ghanaian President John Atta Mills, and architect Daniel Libeskind.

Fulbright recipients are among over 40,000 individuals participating in U.S. Department of State exchange programs each year. For more than sixty years, the Bureau of Educational and Cultural Affairs has funded and supported programs that seek to promote mutual understanding and respect between the people of the United States and the people of other countries.

The International Fulbright Science &Technology Award is administered by the Institute of International Education (IIE). For more information, please visit **www.fulbright.state.gov**.

CLARICE AIELLO

BRAZIL
QUANTUM COMPUTING: MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Clarice Aiello is a doctoral candidate in MIT's Nuclear Science and Engineering Department, where she is investigating how defects in diamond crystals might be used as quantum computers. Her work focuses on the nitrogen-vacancy (N-V) center, a common defect that pairs a nitrogen atom (in place of a carbon atom) with a nearest-neighbor vacancy in the diamond's carbon lattice. The two spin states of the N-V center permit a binary coding of information, as in a classical computer. But because crystal defects are governed by the laws of quantum mechanics, simultaneous combinations of the two basic N-V information states are possible as well—the defining feature of quantum computing. Clarice's experiments will help to determine the practical feasibility of N-V centers as quantum computers.

A native of Brazil, Clarice received an undergraduate engineering degree from the École Polytechnique in France, a Master's degree in physics from the University of Cambridge (Trinity College), and a Diploma in quantum optics from Leopold-Franzens Universität in Innsbruck, Austria. Her interests include opera, long-distance running, and playing the piano.

IRENE BALLAGH

NEW ZEALAND
NEUROSCIENCE: COLUMBIA UNIVERSITY

Irene Ballagh is a Ph.D. candidate in Columbia's Neurobiology & Behavior Program, where she is studying the brain circuits involved in the courtship duets and vocal duels of the African clawed frog. Many species, including human beings, tend to favor vocal communication as a way of assessing and attracting potential mates; such vocal signals are often reciprocated and coordinated. Despite its importance, however, the brain processes underlying vocal communication are not yet well understood. The clawed frog, though modest in brainpower, has a surprisingly sophisticated vocal repertoire, making it an apt candidate for detailed study.

A native of New Zealand, Irene received a Bachelor's degree in neuroscience from the University of Otago, where she studied the role of a neural protein, lost to Alzheimer's patients, in the molecular mechanisms of memory formation. She enjoys the cultural diversity of New York City and has become a fan of the Boston Red Sox.

REBECCA BEST

CANADA
ECOLOGY AND EVOLUTION: UNIVERSITY OF CALIFORNIA AT DAVIS

Rebecca Best is a Ph.D. candidate in population biology at UC Davis' Bodega Marine Laboratory, where she is investigating communities of small, algae-eating crustaceans in Bodega Bay, on the coast of northern California. Her research will help us to understand how non-native crustaceans are able to invade this ecosystem, and could also shed new light on the central question of species diversity: Why do we see so many species of plants and animals in one place? Her ultimate aim is to help protect life through a better understanding of its diversity.

A native of Canada, Rebecca received both undergraduate and master's degrees from the University of British Columbia. While pursuing graduate study, she is also exploring ways to share her fascination with marine science and ecosystems with a wide range of people, including middle-school student participants in her projects, undergraduate researchers, and members of the public who tour the Laboratory.

LIMOR BURSZTYN

ISRAEL
ENGINEERING: STANFORD UNIVERSITY

Limor Bursztyn is a doctoral candidate in Electrical Engineering at Stanford, where she is studying how neural circuits represent and process information in the brains of fruit flies. She is currently imaging the activity of specific neurons in the fly's brain as the insect views changing scenes, as well as investigating how the motion of a walking fly is influenced by such stimuli. As this research is strongly interdisciplinary, Limor works with specialists in neurobiology and biophysics in addition to engineering. Her goal is to understand the unique computational capabilities of the brain generally.

Born in Israel, Limor received both Bachelor's and Master's degrees from Tel Aviv University, where, as an undergraduate, she became a research assistant in the reproductive and respiratory bio-engineering laboratory. Her Master's thesis explored a mathematical model for excitation and contraction in cells of the myometrium, the muscular middle layer in the wall of the uterus.

JIASHU CHEN

CHINA

ENGINEERING: UNIVERSITY OF CALIFORNIA AT BERKELEY

Jiashu Chen is a Ph.D. candidate at UCB's Electrical Engineering and Computer Science Department. He is also an active researcher at the Berkeley Wireless Research Center, which is devoted to the design and implementation of next-generation wireless systems in computers and mobile devices through use of state-of-the-art technologies. His research focuses primarily on integrated circuits operating at radio frequencies. However, he is also investigating the feasibility of low-cost circuits operating at millimeter-wave frequencies; these would offer much higher rates of data transmission, and would eventually permit the replacement of cables by wireless systems.

A native of China, Jiashu received his Bachelor's degree from the City University of Hong Kong; he earlier studied at Fudan University in Shanghai. From January to May of 2006, he was an exchange student in the Department of Electrical and Computer Engineering at Carnegie Mellon University in Pittsburgh.

Jaishu Chen was unable to attend the S&T Washington, DC Capstone.

FABIO FACHIN

ITALY

ENGINEERING: MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Fabio Fachin is a doctoral candidate in aerospace engineering at MIT, where he is investigating the potential of extremely small electro-mechanical devices for aerospace and biomedical use. With dimensions in the micrometer to nanometer range, these highly advanced systems are invisible to the naked eye. However, they have correspondingly low weight—a major virtue in aerospace applications—and permit the manipulation of such microscopic objects as cells and viruses, which cannot be grasped by conventional instruments. Through use of carbon nanotubes and silicon-based micro-fabrication techniques, Fabio hopes to create a new generation of such devices for spacecraft control and global health programs, with a particular focus on developing countries.

A native of Italy, Fabio received both Bachelor's and Master's degrees from Politecnico di Milano, and spent a year at the Delft University of Technology in the Netherlands in order to integrate his engineering experience with business and management. He later worked at a microelectronics firm in Singapore. Fabio enjoys swimming, hiking, and running (competing in the 2009 Boston Marathon). Fabio would welcome the opportunity to become an astronaut.

RONALD GONZÁLES

COSTA RICA

SOIL AND WATER SCIENCE: UNIVERSITY OF FLORIDA AT GAINESVILLE

Ronald Gonzáles is a Ph.D. candidate in Soil and Water Science at the University of Florida, where he is studying the phosphorus nutrition of two varieties of warm-season turf grasses and the environmental impacts of phosphorus fertilization. Plants cannot live without an adequate supply of phosphorus. In some types of soils, however, phosphorus may leach down to the ground water; this element may then be returned to surface waters, triggering increased growth of sunlight-blocking algae in a process known as eutrophication. The consequent depletion of oxygen can kill fish and other aquatic life. Ronald's research is aimed at determining the levels of phosphorus required for optimal turf growth and quality, beyond which ecosystems are at risk from phosphorus leaching and eutrophication.

A native of Costa Rica, Ronald received a Licenciate in Tropical Agriculture from EARTH University in Guácimo, and a Master's degree in Soil Science from the University of Wisconsin at Madison. Before coming to the University of Florida, he was Research Coordinator and Assistant Scientist at the Standard Fruit Company of Costa Rica, and Agricultural Farm Manager at Gape, S.A., both in San Carlos. Upon returning home, Ronald hopes to develop improved nutrient management practices for agriculture.

SAMIUL HASAN

BANGLADESH

ENGINEERING: PURDUE UNIVERSITY

Samiul Hasan is a Ph.D. candidate in Purdue's Department of Civil Engineering, where he is investigating transportation as a complex system, expanding upon doctoral research begun earlier at MIT's Intelligent Transportation System Laboratory. The motivation for this work is provided by conditions in Samiul's native city of Dhaka, Bangladesh, where traffic congestion plagues a population of 10.5 million residents and forces them to use a currently inefficient and inadequate mass-transportation system. Samiul believes that the alleviation of such conditions requires city planning with the implementation of an advanced, sustainable transportation system.

Samiul received Bachelor's and Master's degrees in engineering from the Bangladesh University of Engineering and Technology, where he developed a travel-demand model for Dhaka within a developing-nation framework and also served as a lecturer in civil engineering. In the summer of 2008, he was a research intern at Transport for London, UK. Upon returning to his native country, Samiul hopes to teach and do research at a technical institute, and to participate in Bangladeshi development.

JUAN EUGENIO IGLESIAS

SPAIN

ENGINEERING: UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Juan Eugenio Iglesias is a doctoral candidate in Biomedical Engineering at UCLA's Laboratory of Neuro Imaging, where he is developing computer software that will automatically analyze three-dimensional brain images obtained by magnetic-resonance imaging (MRI). Such brain scans are currently analyzed by manual techniques that are laborious, time-consuming, and prone to error. Juan Eugenio's software will help scientists to rapidly translate these images into an accurate description of brain anatomy, thus facilitating investigations of the interaction between brain structure and behavior. This work has important applications to the study of Alzheimer's and other brain diseases, as well as to studies of the healthy brain.

A native of Spain, Juan Eugenio received his first Master's degree from the University of Seville, and then two additional Master's degrees, in Electrical Engineering and in Wireless Systems, from the Royal Institute of Technology in Stockholm. He was subsequently a research assistant at the University of Seville, and at the University of Copenhagen. During his studies at UCLA, he has held summer internships at the University of Nijmegan, in the Netherlands, and at Microsoft Research in Cambridge, UK.

SEUNGWON (EUGENE) JEONG

SOUTH KOREA

MANAGEMENT SCIENCE AND ENGINEERING: STANFORD UNIVERSITY

Eugene Jeong is carrying out research in financial engineering as a doctoral candidate in Stanford's Management Science and Engineering Department. His primary interests are econometrics, which combines economic theory with statistics to analyze and test economic relationships, together with the statistical approach of stochastic simulation. Econometrics has important applications to the optimization of investment portfolios—a well plowed but still fertile research field—and to the modeling and prediction of credit risk, which remains poorly understood despite the ever-present threat of default.

Born in South Korea, Eugene received a Bachelor's degree in engineering and related subjects, and a Master's degree in mathematics, from the Pohang University of Science and Technology. During the autumn of 2003, he was an exchange student at the University of Waterloo in Canada. He was earlier a software developer at Ahnlab Inc., South Korea's leading information-security company, in Seoul. Eugene particularly likes fine art and music, and enjoys playing the piano and the drums.

KRISADA (MICK) KRITAYAKIRANA

THAILAND
ENGINEERING: STANFORD UNIVERSITY

Krisada Kritayakirana is a doctoral candidate in mechanical engineering at Stanford's Dynamic Design Lab, where he is designing a system for the control of an autonomous vehicle at the limits of handling. Like an expert racecar driver, the controller senses the available tire grip, then adjusts the steering, brake, and throttle inputs to obtain optimum vehicle performance within this limit. An autonomous test vehicle is now scheduled for speed trials and a climb up Pikes Peak. Krisada's controller could, as a component of a driver-assistance system, makes the high-performance passenger car of the future safer and easier to drive.

A native of Thailand, Krisada has had a passion for cars since an early age. He received his Bachelor's degree from Chulalongkorn University in Bangkok, then took a Master's degree in engineering at the University of Cambridge (Queens' College), where his research focused on vehicle-suspension vibration at high frequencies; he remained in the UK for two years to work at Lotus, the noted sports-car manufacturer. Following his degree at Stanford, Krisada plans to return to Thailand as a social entrepreneur, with the aim of improving the lives of the Thai people.

CLAUDIA LOUIS

SAINT LUCIA
INFORMATION SCIENCE AND TECHNOLOGY: SYRACUSE UNIVERSITY

Claudia Louis is a doctoral candidate in Syracuse's School of Information Studies, where she is studying the use and impact of technology for education and development in resource-poor countries. Claudia seeks to learn how national and local governments around the world can use information and communications technologies to develop "intelligent communities" that are relevant and competitive in the global environment, particularly by testing and applying theories of competitive advantage already adopted by the private sector. Her research should help to identify best practices and to furnish recommendations for developing nations.

Born on the Caribbean island of St. Lucia, Claudia received a Bachelor's degree in computer science and management from the University of Technology in Kingston, Jamaica, and later earned an MBA degree from Carleton University's Sprott School of Business in Ottawa, Canada. Her work experience in St. Lucia includes secondary-school teaching and a five-year appointment as a software engineer at the Ministry of Education in Castries. Claudia enjoys travel and outdoor activities.

ALEKSANDER MĄDRY

POLAND

COMPUTER SCIENCE: MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Aleksander Mądry is a Ph.D. candidate in MIT's Electrical Engineering and Computer Science department, where he develops improved algorithms (lists of computational instructions) for the solution of logistics problems of fundamental importance to theoretical computer science. His research focuses particularly on the challenge of traversing a network of roads in the most efficient way, where the measure of efficiency might be the shortest route or the least congested route. Aleksander is also studying variants of this problem, in which one lacks information about current road traffic or must take into account a specified probability that some parts of the network are unavailable. His professional interests include algorithmic graph theory and combinatorial optimization.

Born and raised in Wrocław, Poland, Aleksander received a Bachelor's degree in theoretical physics and mathematics from the University of Wrocław, where he also pursued Master's-level studies in computer science. While a student in Poland, Alexander carried out research at the Max Planck Institute for Computer Science, at the University of Lübeck, in Germany, and at the Joint Institute for Nuclear Research, in Dubna, Russia. Upon returning to Poland, he hopes to stimulate research in theoretical computer science and to facilitate cooperation between Polish and foreign researchers.

ETHELDREDA NAKIMULI-MPUNGU

UGANDA

PSYCHIATRIC EPIDEMIOLOGY: THE JOHNS HOPKINS UNIVERSITY

Etheldreda Nakimuli-Mpungu is a Ph.D. candidate in the Mental Health Department of Johns Hopkins' School of Public Health, where she is investigating the impact of lifetime depressive and alcohol-use disorders on adherence to treatment regimens among rural Ugandans with HIV infection. Previous research has shown that HIV-positive individuals are much more likely to have mental-health problems than those who test negative; if undiagnosed and untreated, such problems may cause HIV patients to refuse to take prescribed anti-retroviral medications. Etheldreda's goal is to help integrate Ugandan mental-health services into existing HIV-treatment services by developing screening tools for mental-health problems related to HIV infection, and by developing associated treatment guidelines.

A native of Uganda, Etheldreda received a Bachelor's degree in Medicine and Surgery, and a Master's degree in Psychiatry, from Makerere University in Kampala. She is an active advocate for mental health in Uganda; before coming to Johns Hopkins, she was Medical Officer and later Resident Psychiatrist at Ugandan hospitals.

NEKTARIOS PAISISIOS

CYPRUS

COMPUTER SCIENCE: NEW YORK UNIVERSITY

Nektarios Paisisios is a doctoral candidate in NYU's Department of Computer Science. As a blind person, he has a particular interest in finding solutions to such everyday problems as the inaccessibility of visually presented information, barriers to mobility, and the lack of equal access to mobile phones and other popular devices. His is currently creating mobile-phone software that would help visually impaired people navigate unfamiliar environments, particularly building interiors, where GPS signals are usually unavailable. Nektarios' system instead analyzes the relative strengths of different Wi-Fi signals, together with data from the compass, accelerometer, and other sensors built into modern phones, to assemble a navigator that is easy to use and low in cost.

A native of Cyprus, Nektarios received both Bachelor's and Master's degrees from the University of Cyprus. He will be a Google intern through the summer of 2010. Nektarios is also proud to have been, in 2004, one of the bearers of the Olympic flame, an event which engraved in his memory "the sense of unity and brotherhood required amongst all peoples."

MARTIN PETRICIC

CROATIA

ENGINEERING: UNIVERSITY OF CALIFORNIA AT BERKELEY

Martin Petricic is a doctoral student in ocean engineering at UC Berkeley, where he is studying the forces caused by randomly occurring ocean waves that act upon the structure of a ship throughout its life. The challenge of this research field, which lies at the intersection of engineering and statistics, is to develop a realistic statistical model of the waves' overall, long-term load on the ship's structure. This work has important implications for ship design: if the load is overestimated, the structure will be overdesigned and uneconomical; if the load is underestimated, the structure designed may be unsafe and unfit for navigation.

A native of Croatia, Martin received his Bachelor's degree in mechanical engineering and naval architecture from the University of Zagreb. Since 1996, he has been a member of the Croatian National Fencing Team, and has competed in numerous world-class fencing tournaments.

DIEGO PLOPER

ARGENTINA

BIOLOGY: UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Diego Ploper is a Ph.D. candidate in UCLA's Department of Biological Chemistry. His research interest is developmental biology, the process by which a complex organism develops from a single cell—particularly the early phase of gastrulation, in which the animal embryo is reorganized into three germ layers, each destined to produce specific sets of tissues or organs. A complex network of interacting proteins regulates gastrulation; Diego aims to understand how components of this protein network interact to produce a perfectly formed embryo. Because the same biochemical processes that shape embryonic growth later help to maintain tissue and organ stability, Diego's work will also contribute to our understanding of many human diseases, such as cancer, characterized by disruption of these processes.

A native of Argentina, Diego received a Bachelor's degree from the National University of Tucumán, where he specialized in biochemistry. His ultimate goal is to establish his own research laboratory, and to contribute to science education in Argentina.

ALLAN-HERMANN POOL

ESTONIA

NEUROSCIENCE: UNIVERSITY OF CALIFORNIA AT BERKELEY

Allan-Hermann Pool is a Ph.D. candidate in Neuroscience at UCB, where he seeks to understand how brains represent such biological drives as hunger and thirst, and how these brain-based systems influence feeding behavior. Scientists have now identified the molecular signaling pathways and cell populations that regulate food consumption; however, we still know little about how different signaling systems are integrated by circuits in the central nervous system, and how activity in these circuits alters feeding behavior. These are the questions that Allan-Hermann is addressing in research on fruit flies, which are structurally distinct from mammals and have brains 1,000 times smaller, but which resemble mammals in molecular feeding regulation. This work is expected to contribute to a deeper understanding of mammalian feeding behavior, ultimately including human eating behavior and disorders.

A native of Estonia, Allan-Hermann received a Bachelor's degree in molecular biology from Tallinn University of Technology, and a Master's degree in neurobiology from Kuopio University in Finland. He is a champion debater, and enjoys surfing and soccer.

MOHAMED S. RAAFAT

EGYPT
MECHANICAL ENGINEERING: MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Mohamed S. Raafat is a pre-doctoral candidate in MIT's Department of Mechanical Engineering, where he is designing microfluidic devices, made of polymers or glass, for the sorting of biological cells according to their physical properties. The sorting and separation of cells is essential for biomedical research and diagnostics, which often require the detection and isolation of particular cell types from a fluid mixture (e.g., the separation of cancer cells from a blood specimen). But current sorting techniques tend to be costly, complex, and demanding of operator skills; moreover, only a few differentiate cells on the basis of their deformability, an important criterion for detection of such diseases as cancer and malaria. Mohammed's research aims to surmount these obstacles by providing deformation-sensitive cell sorting that is reliable, inexpensive, and easy to use. Such technology would significantly promote diagnostics and healthcare in parts of the world where advanced laboratory facilities and skilled operators are not available.

A native of Egypt, Mohamed received Bachelor's and Master's degrees in mechanical engineering from Cairo University. During a summer internship, he worked as a research engineer at the American University in Cairo, synthesizing and characterizing novel nano-structured materials. Mohamed enjoys reading (in English, French, or Arabic), playing the piano, and rowing.

ALEJANDRO REYES MUÑOZ

COLOMBIA
BIOLOGY: WASHINGTON UNIVERSITY, ST. LOUIS

Alejandro Reyes Muñoz is a Ph.D. candidate in computational and systems biology at Washington University's Center for Genome Sciences, where he is studying the relationship between the microbiota (microbial communities) resident in the human gut and such varied physiological states as obesity and malnutrition. Within mammals, and especially humans, microbiota are essential for digestion and for the acquisition of nutrients. His research focuses particularly on the role that bacteria-infecting viruses play within these complex microbial communities, and their effect on disease.

A native of Colombia, Alejandro Reyes received both Bachelor's and Master's degrees in microbiology from Universidad de los Andes in Bogotá. In research undertaken before beginning his current doctoral program, he studied the viral infection of shrimp genes, and also the molecular biology and genetics of the tuberculosis bacterium, which led to the development of new methods for the identification of drug-resistant tuberculosis.

HELEN SAAD

LEBANON

BIOENGINEERING: UNIVERSITY OF CALIFORNIA AT SAN DIEGO

Helen Saad is a doctoral candidate in UCSD's Bioengineering Department, where she is investigating the unmatched networking capabilities of the human brain—in particular, how signals and information are propagated through a neuronal network that includes the two major types of cells in the central nervous system: neurons and astrocytes. Through experiments and computer simulations, Helen hopes to more fully understand how functional networks can remodel the brain's underlying structure. Her work will help to explain how Alzheimer's and other brain diseases cause remodeling of brain structure and function in the areas affected.

A native of Lebanon, Helen received a Bachelor's degree in computer engineering from the Lebanese American University, subsequently working for 5 years as a software and operations engineer in local and multinational companies. She is the first and only Lebanese citizen to receive an International Fulbright Science & Technology Award. Upon returning to her homeland, Helen plans to start a research center that will help bring Lebanon to the forefront of science, education, and cultural exchange.

FILIPPO SCOTTI

ITALY

PLASMA PHYSICS: PRINCETON UNIVERSITY

Filippo Scotti is carrying out experimental research in plasma physics at Princeton University. His research topic is the study of the transport of impurities in a nuclear fusion device, the National Spherical Torus Experiment (NSTX) at the Princeton Plasma Physics Laboratory (PPPL). The main goal of the laboratory is to develop thermonuclear fusion as an inexhaustible source of clean energy.

Born in Piacenza, Italy, Filippo received a Bachelor's degree in engineering physics from the Politecnico of Milan where he graduated summa cum laude. During his Bachelor's level studies, Filippo's interests focused primarily on energy production and global energy problems. These interests led him to pursue a Master of Science in Nuclear Engineering at the Politecnico of Milan. After winning a Monbukagakusho scholarship from the Japanese Ministry of Education, Filippo spent two years at the University of Tokyo doing thesis research on laser aided low temperature plasma diagnostics. These opportunities allowed him complete a double Master's degree in Nuclear Engineering at the Politecnico of Milan and in Quantum engineering at the University of Tokyo.

HEIDA MARIA SIGURDARDOTTIR

ICELAND

NEUROSCIENCE: BROWN UNIVERSITY

Heida Maria Sigurdardottir is a doctoral candidate in neuroscience at Brown, where she strives to understand how the brain makes sense of what we see, and how it uses visual input to guide our actions effectively. Her work should therefore help to resolve a current debate concerning the way the brain processes visual information. It has long been believed that there are two main visual pathways in the brain: one dedicated to the perception of shapes and objects, and a second dedicated to processing spatial information and guiding actions. However, this classical view has now been challenged by the finding that, in some brain areas, the second pathway seems also to respond selectively to different shapes. Heida Maria is now investigating the origins and plasticity of this puzzling shape-selective brain activity.

A native of Iceland, Heida Maria received a Bachelor's degree in psychology from the University of Iceland, where she carried out research on the human visual system. She subsequently worked for two years at the Icelandic Web of Science, a non-profit organization devoted to the public understanding of science and technology. Heida Maria is the president and co-founder of Res Extensa, the Association for Mind, Brain, and Behavior.

JIŘÍ ŠIMŠA

CZECH REPUBLIC

COMPUTER SCIENCE: CARNEGIE MELLON UNIVERSITY

Jiří Šimša is a Ph.D. candidate in Carnegie Mellon's Computer Science Department, where he uses formal reasoning techniques, such as logic and abstraction, to analyze complex computer software and hardware systems, particularly to detect errors in system designs at various stages of the product-development cycle. His work thus targets the great challenge of verifying the correctness of complex man-made systems. Jiří's broader research agenda includes the automation of formal-reasoning techniques to boost the productivity of software and hardware engineers throughout the product-development cycle.

Born in a rural village in the Czech Republic, Jiří received both Bachelor's and Master's degrees in computer science from Masaryk University in Brno. During the year before he came to Carnegie Mellon, he pursued a Bachelor's degree in economics while working at the Czech software company AVG in Grisoft. He has also held internships at Aalborg University in Denmark, and at Microsoft Research, in Cambridge, Massachusetts.

YUSUF SARWAR UDDIN

BANGLADESH

COMPUTER SCIENCE: UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Yusuf Sarwar Uddin is a Ph.D. candidate within UI's cyber-physical research group. A cyber-physical system (CPS) is characterized by a close connection and coordination between computational elements, such as cell phones, and a surrounding physical environment, such as terrain; a CPS is typically implemented as a network. One important CPS application is to disruption-tolerant communications networks designed to survive natural disasters, such as the earthquake in Haiti. Yusuf's primary research interest lies in the delay characteristics of such networks; he also intends to develop energy-efficient communications protocols for them.

A native of Bangladesh, Yusuf received both Bachelor's and Master's degrees from the Bangladesh University of Engineering and Technology, where he taught for a year before coming to the University of Illinois. In his vision of a better future for his people, Yusuf has been particularly inspired by the work of a fellow Bangladeshi—Nobel Laureate and Fulbright alumnus Muhammad Yunus, the pioneer of microfinance for the poor.

CAROLINE UHLER

SWITZERLAND

STATISTICS: UNIVERSITY OF CALIFORNIA AT BERKELEY

Caroline Uhler is a doctoral candidate in UCB's Department of Statistics. Her general research field is algebraic statistics, which brings the methods of algebra and algebraic geometry to bear upon statistical problems. Her particular interest is the validity of maximum-likelihood estimates (MLEs), which have appealing mathematical properties, in their application to Gaussian graphical models of statistical distributions involving a large number of variables, but for which only a few constraining observations are available. This question is of importance, for example, to the study of genetic networks, in which gene-expression data may be known for only a few individuals. During her first year at Berkeley, Caroline gained experience in this field through a collaborative study of the Neanderthal mitochondrial genome.

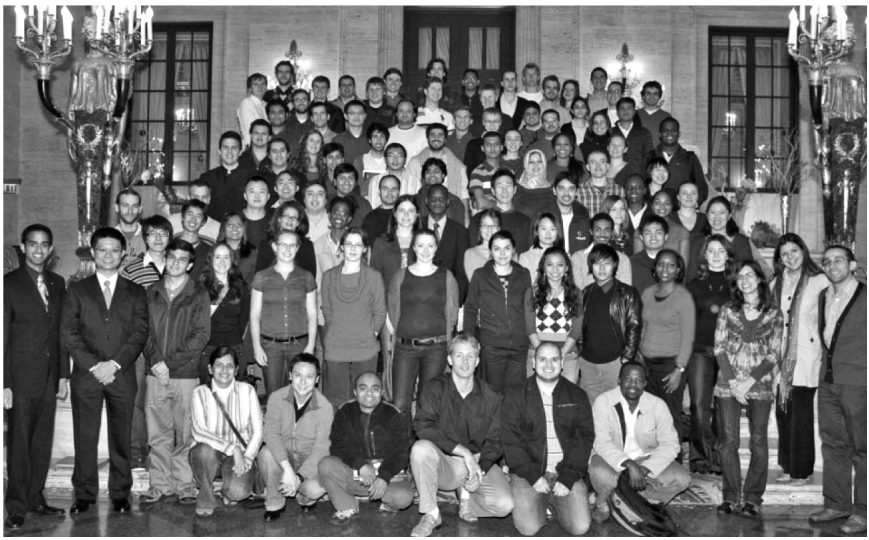
A native of Switzerland, Caroline received Bachelor's and Master's degrees in mathematics and biology from the University of Zurich, where she subsequently completed a Didactic Education Program for high-school teachers. She earlier taught English at a public school in Thailand. At Berkeley, Caroline is active in networking with fellow Swiss students and in organizing ethnic dinners in San Francisco for Fulbrighters in the Bay area.

PÉTER VARJÚ
HUNGARY
MATHEMATICS: PRINCETON UNIVERSITY

Péter Varjú is a Ph.D. candidate in Princeton's Mathematics Department, where he is studying expansion properties of finitely generated subgroups of arithmetic groups. He is particularly interested in the properties of those graphs or networks that may be classed as expanders. The existence of expanders has long been known, but it is only fairly recently that explicit constructions of certain expanders have been provided by group theory and number theory. Péter is now engaged in simplifying and generalizing these advances. Although his research lies at the frontiers of mathematics, it has important applications to computer science and engineering.

Péter was born in Szeged, Hungary, the historic city famous for its production of paprika. After receiving his Bachelor's degree in mathematics from the University of Szeged, he spent a year carrying out research on approximation theory at the Hungarian Academy of Sciences. Upon returning to Hungary, Péter hopes to teach at a university.

Péter Varjú was unable to attend the S&T Washington, DC Capstone.



Fulbright S&T Fellows at the Chicago Enrichment Seminar, November 2009.
Joseph Chen Photography

INTERNATIONAL FULBRIGHT S&T WEBSITE

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