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Siemens Competition
2016 Regional Finals

Georgia Institute of Technology Judges

Joseph Montoya (Lead Judge)

Joseph Montoya is a Professor in the School of Biological Sciences and a biological oceanographer with research interests at the interface of biology and geochemistry. His lab specializes in studies of the marine nitrogen cycle and the role of N_2-fixation (diazotrophy) in structuring the flow of nitrogen and energy through planktonic ecosystems. Much of his lab's work has focused on N cycle processes in marine ecosystems using a combination of direct experimental rate measurements and stable isotope natural abundance approaches. More recently, Dr. Montoya's lab has become deeply involved in studies of the impact of the Deepwater Horizon oil spill on offshore ecosystems of the Gulf of Mexico. The Montoya lab research program is highly interdisciplinary, incorporating work in plankton biology, marine chemistry, and isotope biogeochemistry both at sea and in the lab.

Dr. Montoya received an A.B. in Biology at the University of California and a Ph.D. in Organismic and Evolutionary Biology from Harvard University. He served on the faculty of the Departments of Organismic and Evolutionary Biology and Earth and Planetary Sciences at Harvard before moving to Georgia Tech in 1998.

Annalisa Bracco

Annalisa Bracco is a Professor in the School of Earth and Atmospheric Sciences at Georgia Tech. She has an extensive background i computational fluid dynamics, physical oceanography and climate. Her research interests include (1) transport and mixing processes in geophysical flows, (2) ocean predictability and inverse dynamics, (3) intra-seasonal to decadal variability of the climate system at regional and global-scales and (4) quantification of uncertainties and sensitivity of the climate system using innovative 'big data' algorithms. She received her PhD in 2000 at the University of

Genoa (Italy) and has worked at the International Center for Theoretical Physics and the Woods Hole Oceanographic Institution before moving to Georgia Tech in 2007.

Henry La Pierre

Henry, also known by his nickname, Pete, is an Assistant Professor in the Department of Chemistry and Biochemistry at the Georgia Institute of Technology. His research program develops the molecular and solid-state coordination chemistry of the *f*-elements for unique and scalable solutions to contemporary problems in energy use. These studies encompass applications in energy conversion (photochemical, magnetic) and transport (electrical) and in information storage and processing technology. These applications are supported by the development of methodologies for *f*-element separations and recycling.

Dr. La Pierre received an A.B. in Chemistry *magna cum laude* from Harvard University in 2002 and completed his Ph.D. in Inorganic Chemistry at the University of California, Berkeley in 2011. Prior to joining Georgia Tech, he was a postdoctoral scholar at FAU Erlangen-Nuremberg from 2011-2014 and a Director's Postdoctoral Fellow at Los Alamos National Laboratory from 2014-2016.

Eva K. Lee

Eva Lee is a Professor in the H. Milton Stewart School of Industrial and Systems Engineering at Georgia Institute of Technology, and Director of the Center for Operations Research in Medicine and HealthCare. She is also a Senior Health Systems Professor for the U.S. Department of Veterans Affairs; and a Co-Director of the Center for Health Organization Transformation, a National Science Foundation Industry/University Cooperative Research Center.

Dr. Lee works in the area of mathematical programming and large-scale computational algorithms, and tackles challenges arising from industrial problems through systems modeling, algorithms and software design, and decision theory analysis. Within healthcare, Dr. Lee's research areas span health risk prediction, early disease diagnosis and detection, optimal treatment strategies and drug

delivery, healthcare outcome analysis and treatment prediction, public health and medical preparedness, large-scale healthcare/medical decision analysis, quality improvement, logistics operations management, health information technology, and health organization transformation. Outside healthcare, Dr. Lee works with industrial practitioners to improve efficiency and quality of services through process and systems optimization and organization transformation.

Raquel Lieberman

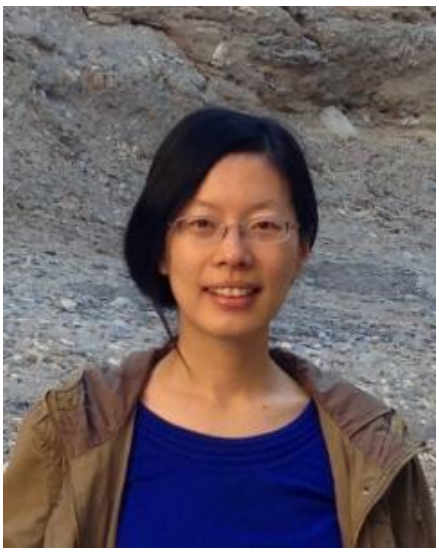
Raquel Lieberman, an Associate Professor in the School of Chemistry and Biochemistry at Georgia Tech, is interested how cells survive by recognizing and responding to intracellular signals. Cells employ several mechanisms to maintain homeostasis, and if these systems are mis-regulated, changes in metabolite concentrations or protein production/folding eventually lead to a host of diseases. In addition, some of these pathways exist in and are exploited by pathogens such as bacteria and viruses. The lab seeks to understand the details of structure, function, and mechanism of proteins involved in these highly regulated pathways, focusing on enzymes that perform hydrolysis reactions in an unexpected chemical environment: within lipid membrane or near the surface of membranes. In the long term, the lab hopes to identify small molecules to modulate these activities and prevent diseases associated with aberrant signaling behavior.

Dr. Lieberman received her BSc in Chemistry from M.I.T and her MS and PhD in Chemistry from Northwestern University. Prior to her arrival at Georgia Tech in 2008, Dr. Lieberman was an NIH-sponsored postdoctoral research fellow at Brandeis and Harvard Medical School.

Tom Morley

Tom Morley (Carnegie-Mellon '76) is an applied Mathematician with many interests. In addition to two books, he is the author of over 60 papers, which have appeared in various Mathematics,

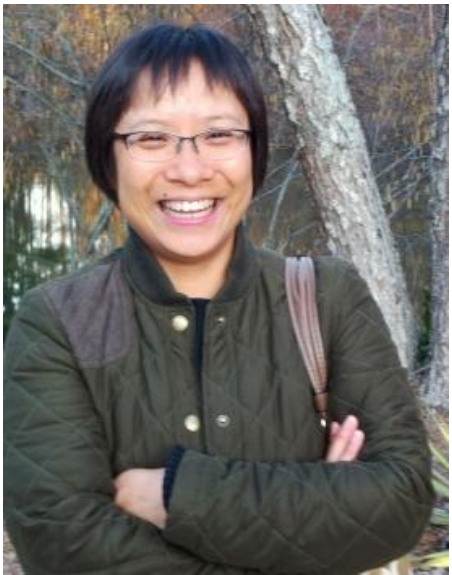
Operations Research, Physics, Electrical Engineering, and education journals. Some of his recent interests include High School standards, standardized testing, distance learning, and combinatorial games.



Shuyi Nie

Shuyi Nie is an Assistant Professor in the School of Biological Sciences at Georgia Tech. Her research interests center on the mechanisms of cell and tissue movements during animal development. During development, different groups of cells move to different locations in a growing embryo to give rise to specific tissue and structures. The cells not only sense the environment to determine their path, their interactions with different neighbors and extracellular signals on their way also influence their fate decision and differentiation. All of the extracellular signals are then integrated in the cell and relayed to the cytoskeleton, which powers the locomotion of the cell. The lab now focuses on understanding how the cytoskeletal machinery is controlled and how cell and extracellular matrix remodel each other at different phases of cell migration.

Dr. Nie received her BS in Biology from Peking University and her PhD in Cell Biology from University of Alabama at Birmingham. Prior to her arrival at Georgia Tech in 2014, Dr. Nie was a postdoctoral fellow and then senior research fellow at Caltech.



Dong Qin

Dong Qin an Associate Professor in the School of Materials Science and Engineering, with an adjunct appointment with the School of Chemistry and Biochemistry, at Georgia Institute of Technology. Her research interests center on the frontiers that bridge traditional fields of chemistry and

materials science, with a focus on peculiar properties and applications driven by materials and systems at the nanoscale. Her expertise includes nanomaterials, surface-enhanced Raman spectroscopy (SERS), soft lithography, self-assembly, colloidal physics and chemistry, and responsible development of nanotechnology.

Dr. Qin was born and raised in Shanghai, China. Her academic records include a BS in Chemistry from Fudan University, a PhD in Physical Chemistry with Professor Hai-Lung Dai from the University of Pennsylvania, a postdoctoral stint in Materials Chemistry with Professor George M. Whitesides at Harvard University, and an MBA from the University of Washington. She started her position at Georgia Tech in 2012.

Frederik Vannberg

Professor Vannberg received his Ph.D. in Human Genetics from Oxford University in 2009. He then served a two year Post Doctoral Fellowship at Oxford's Wellcome Trust Centre for Human Genetics before joining Georgia Tech as an Assistant Professor (Biology) in July 2011. His research has been in immunogenetics and understanding human genetic susceptibility to infectious diseases. He has already developed an international reputation as a driving force in the field and is now expanding his research to include studies nanovesicular exosomes in health and disease. These naturally occurring vesicles circulate in the bloodstream and have been found to be excellent biomarkers for various diseases, including infection and cancer. He has won a number of prizes and fellowships including the Syngenta Prize at the UK Young Entrepreneurship competition, UK Overseas Research Student Fellowship and he is a Fellow of the Royal Society of Tropical Medicine and Fellow of Green Templeton College (Oxford University). Professor Vannberg serves on the management committee for the Wellcome Trust Case Control Consortium, and leads international collaborations on HIV-1 in The Gambia, leprosy in India and Buruli ulcer in Ghana. He has published recent articles in *New England Journal of Medicine*, *Nature Genetics*, *PLoS Pathogens*, *Journal of Immunology* and *Immunological Reviews*.