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Siemens Competition
2015 Regional Finals
Georgia Institute of Technology Judges

Joseph Montoya, Lead Judge

Joseph Montoya is 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 N2-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.

Lawrence Bottomley

Lawrence Bottomley is an analytical chemist with expertise in electroanalytical chemistry, scanning probe microscopy, surface enhanced Raman scattering, and biosensing. Current research underway in his laboratory focuses on: 1) correlating the mechanical properties of carbon nanotubes and nanocoils with structure using the scanning probe microscope, and 2) determining electrode reaction mechanisms with cyclic square wave voltammetry.

Dr. Bottomley received a B.S. in Chemistry at California State University, Fullerton and a Ph.D. in Analytical Chemistry from University of Houston. He served on the faculty of the Department of Chemistry at Florida State University before moving to Georgia Tech in 1983.

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Annalisa Bracco

Annalisa Bracco is a Professor in the School of Earth and Atmospheric Sciences at Georgia Tech. She has an extensive background in 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.

Raquel L. 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.

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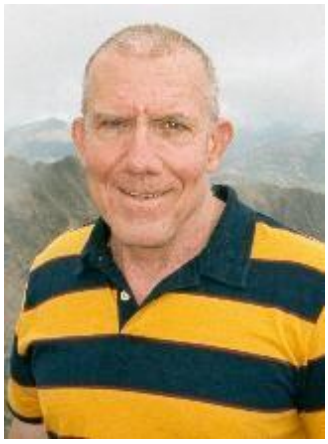
Carson Meredith

Dr. Meredith received his B.S. in Chemical Engineering from Georgia Tech in 1993 and his Ph.D. in Chemical Engineering from University of Texas, Austin, in 1998. From 1998 to 2000 he was an NRC postdoctoral associate at NIST (National Institute of Standards & Technology), in the Polymers Division. Since 2000 he has been a faculty member in the School of Chemical & Biomolecular Engineering at Georgia Tech, in Atlanta, GA, where he is now Professor and Associate Chair for Graduate Studies.

Dr. Meredith's research focuses on advanced materials development and characterization, with an emphasis on structures, transport properties, and adhesion in particle- and fiber-based materials with high interfacial surface area.
Projects include development of high-throughput screening methods for adsorbents and polymers, renewable light-weight high-strength composites and barrier films, and development of bio-inspired adhesives. His work has been featured on the covers of Chemistry of Materials, Macromolecules, Macromolecular Chemistry and Physics, and Macromolecular Materials & Engineering.



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.

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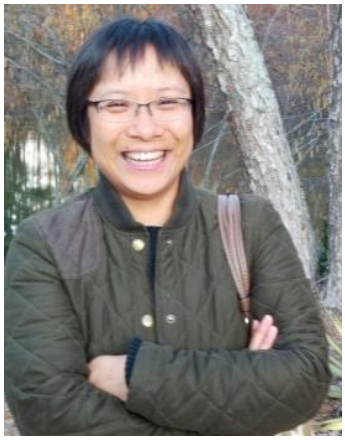

Dong Qin

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.

Jake Soper

Jake Soper is an Associate Professor in the School of Chemistry and Biochemistry at the Georgia Institute of Technology. Prof. Soper's research focuses on the development of new homogeneous transition metal catalysts for selective redox transformations of small molecules, with particular emphasis on multielectron reactions relevant to sustainable organic synthesis, and energy conversion and storage. Recent successes from his lab include the rational design of Earth-abundant base metal catalysts that functionally mimic palladium in cross coupling catalysis cycles for assembly of C–C bonds, and the demonstration of ligand-meditated radical control in catalytic dioxygen activation and oxygen atom transfer reactions relevant to artificial photosynthesis.

Prof. Soper earned a B.S. degree in chemistry from Western Washington University in 1998 and a Ph.D. in inorganic chemistry from the University of Washington in 2003. He was subsequently an NIH Ruth L. Kirchstein Postdoctoral Fellow at the Massachusetts Institute of Technology, before his arrival to Georgia Tech in 2005.

Fredrik 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.

Jie Xu

Jie Xu is a senior research scientist at Georgia Tech Research Institute (GTRI). Her current fields of interests include (a) sensors development for rapid chemical and biological detections in the applications of processing control, environmental monitoring, food safety and medical diagnostics; (b) advanced sample preparation methods for sensitive and accurate detection; (c) development of nanotechnology-based water decontamination systems; (d) alternative physical and chemical based pathogen interventions.

Dr. Xu received her BS and MS degree in analytical chemistry from Lanzhou University and her Ph.D. in analytical chemistry from Georgia Institute of Technology. After she finished her Ph.D. studies, Dr. Xu joined the Center for Advanced Microstructures and Devices (CAMD) at Louisiana State University as a research associate to maintain an X-ray absorption beamline and assist researchers for data collection and interpretation. In 2001, she joined the Electro-Optical

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Environmental Materials Laboratory (EOEML) at GTRI.