

**2017 SIEMENS COMPETITION REGIONAL FINALS  
REGION 6: GEORGIA INSTITUTE OF TECHNOLOGY**

**Judge Bios**

**Joseph Montoya**

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<sub>2</sub>-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.

## **Vinayak Agarwal**

Vinayak Agarwal is an Assistant Professor in the School of Chemistry and Biochemistry and in the School of Biological Sciences at Georgia Tech. He is interested in studying how and why biological systems generate chemical complexity, and how we can leverage this information for applications such as making the next generation of antibiotics? Working at the interface of chemistry and biology, Dr. Agarwal aims to discover, characterize, and find novel applications for biological catalysts.

Dr. Agarwal got his PhD at the University of Illinois Urbana-Champaign. Prior to joining Georgia Tech in 2017, he was a NIH and Helen Hay Whitney Foundation supported postdoctoral fellow at UC San Diego.



## **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.



**J.C. Gumbart**

J.C. Gumbart is an Assistant Professor in the School of Physics at Georgia Tech. His lab is focused on understanding how proteins and other biological systems function at a molecular level. To probe these systems, they carry out molecular dynamics simulations, modeling biological behavior one atom at a time. The simulations serve as a "computational microscope" that permits glimpses into a cell's inner workings through the application of advanced software and high-powered supercomputers. Dr. Gumbart is particularly interested in how bacteria utilize unique pathways to synthesize proteins and insert them into membranes, how they import nutrients across two membranes, and how their cell walls provide shape and mechanical strength.



Dr. Gumbart received his B.S. degree in Physics and Mathematics from Western Illinois University and his Ph.D. in Physics from the University of Illinois at Urbana-Champaign. He then spent two years as a Director's Postdoctoral Fellow at Argonne National Laboratory before coming to Georgia Tech in January, 2013.

**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 L. Lieberman**

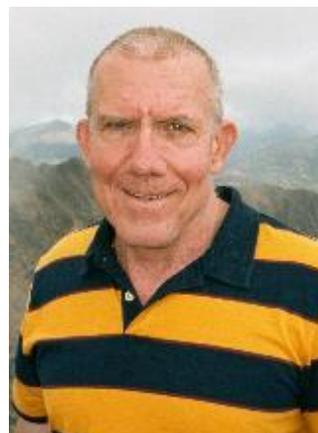
Raquel Lieberman, an Associate Professor in the School of Chemistry and Biochemistry at Georgia Tech, is interested how cells survive by recognizing and responding to intracellular signals. Cells employ several mechanisms to maintain homeostasis, and if these systems are mis-regulated, changes in metabolite 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.



## **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 70 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.



**Yuanzhi Tang**

Yuanzhi Tang is an Assistant Professor at the School of Earth and Atmospheric Sciences. She is interested in understanding the complex interworking between human activities and the natural environment by exploring the molecular scale perspectives of interfacial processes, e.g., interactions of inorganic/organic/biological species at mineral-fluid interfaces. By taking a multi-scale approach from molecular, microscopic, macroscopic, to field scale, her research group aims to obtain a fundamental understanding of (1) the fate, transport, and bioavailability of metal, radionuclide, and nanoparticle contaminants, (2) biomineralization, as well as (3) the biogeochemical cycling of elements in complex environmental settings.

Dr. Tang received her Bachelor of Science and Economics degrees from Peking University in 2003, and MS and PhD degrees in geosciences from the State University of New York at Stony Brook. Prior to her arrival at Georgia Tech in 2012, she was a Postdoctoral Research Fellow and Research Associate at the School of Engineering and Applied Sciences at Harvard University.



**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 Environmental Materials Laboratory (EOEML) at GTRI.

