

COSMOS 2019 – Discovery Lectures

Tuesday, July 9, 2019 – Dr. Nicole Steinmetz (Professor, Nanoengineering, UC San Diego): “Nanoengineering Gone Viral”



Dr. Steinmetz is a Professor of NanoEngineering at the University of California, San Diego (07/2018-present). She started her independent career at Case Western Reserve University School of Medicine in the Department of Biomedical Engineering (in 2010), where she was promoted through the ranks of Assistant, Associate, Full Professor. Dr. Steinmetz trained at The Scripps Research Institute, La Jolla, CA where she was a NIH K99/R00 awardee and AHA post-doctoral fellow (2007-2010); she obtained her PhD in Bionanotechnology from the University of East Anglia where she prepared her dissertation as a Marie Curie Early Stage Training Fellow at the John Innes Centre, Norwich, UK (2004-2007). Dr. Steinmetz has authored more than 150 peer-reviewed journal articles as well as numerous reviews, book chapters, and patents; she has authored and edited books on Virus-based nanotechnology. Over the past 8 years, Dr. Steinmetz has been awarded grants as PI and Co-PI totaling \$18+ million in total costs.

Tuesday, July 16, 2019 – Dr. Rob Knight (Founding Director of the Center for Microbiome Innovation and Professor of Pediatrics and Computer Science and Engineering, UC San Diego): “Microbiomes in Human and Environmental Health”



Rob Knight is the founding Director of the Center for Microbiome Innovation and Professor of Pediatrics and Computer Science & Engineering at UC San Diego. He is a Fellow of the American Association for the Advancement of Science and of the American Academy of Microbiology. He received the 2017 Massry Prize for his microbiome research. In 2015 he received the Vilcek Prize in Creative Promise for the Life Sciences. He is the author of “Follow Your Gut: The Enormous Impact of Tiny Microbes” (Simon & Schuster, 2015), coauthor of “Dirt is Good: The Advantage of Germs for Your Child’s Developing Immune System (St. Martin’s Press, 2017) and spoke at TED in 2014. His lab has produced many of the software tools and laboratory techniques that enabled high-throughput microbiome science, including the QIIME pipeline (cited over 10,000 times as of this writing) and UniFrac (cited over 5000 times including its web interface). He is co-founder of the Earth Microbiome Project, the American Gut Project, and the company Biota, Inc., which uses DNA from microbes in the subsurface to guide oilfield decisions. His work has linked microbes to a range of health conditions including obesity and inflammatory bowel disease, has enhanced our understanding of microbes in environments ranging from the oceans to the tundra, and made high-throughput sequencing techniques accessible to thousands of researchers around the world. Dr. Knight can be followed on Twitter (@knightlabnews) or on his web site <http://knightlab.ucsd.edu/>.

Tuesday, July 23, 2019 – Dr. V. “Ram” Ramanathan (Professor of Atmospheric and Climate Sciences at the Scripps Institution of Oceanography, UC San Diego): “Bending the Curve to Fight Climate Change”



Ramanathan discovered the greenhouse effect of CFCs (chlorofluorocarbons; belongs to family of halocarbons) in 1975 and showed that a ton each of CFC-11 and CFC-12 has more global warming effect than 10000 tons of CO₂. This discovery established the now accepted fact that non-CO₂ gases are a major contributor to planet warming and also enabled the Montreal protocol to become the first successful climate mitigation policy. For this work, he was awarded the Tyler Prize by Nobel Laureate Sherwood Rowland in 2009. In 1980, Madden and Ramanathan were the first to make a statistical prediction that global warming will be detected above the background noise by 2000, a prediction which was verified by the IPCC-UN experts in 2001. He led a NASA study with its climate satellite to show that clouds had a net cooling effect on the planet and quantified the radiation interactions with water vapor and its amplification of the CO₂ warming. He led international field campaigns, developed unmanned aircraft platforms for tracking brown clouds pollution worldwide. His work has led to numerous policies including the formation of the Climate and Clean Air Coalition by the United Nations. He founded, designed, and leads Project Surya along with daughters Nithya Ramanathan and Tara Ramanathan; an extended effort to characterize and mitigate climate and health impacts of cooking with solid biomass as a way to protect the bottom three billion from climate change. He is now leading a University of California climate solutions effort which has launched a course on climate solutions that is expected to reach a million students or more. He was honored as the science advisor to Pope Francis' holy see delegation to the historic 2015 Paris climate summit and in addition advises California Governor Jerry Brown. He was named the UN Climate Champion in 2013; has been elected to the US National Academy and the Royal Swedish Academy which awards the Nobel prizes. Foreign Policy named him a thought leader in 2014; In 2018, He (with James Hansen) was named the Tang Laureate for sustainability science.

Tuesday, July 30, 2019 – Dr. Molly Roberts (Professor of Political Science, UC San Diego): “Censored: Distraction and Diversion Inside China's Great Firewall”



Margaret E. (Molly) Roberts is an assistant professor of political science at UC San Diego. Her research interests lie in the intersection of political methodology and the politics of information, with a specific focus on methods of automated content analysis and the politics of censorship in China. She received a PhD from Harvard in government (2014), MS in statistics from Stanford (2009), and BA in international relations and economics (2009). Currently, she is working on a variety of projects that span censorship, propaganda, topic models and other methods of text analysis. Her work has appeared or is forthcoming in the *American Journal of Political Science*, *American Political Science Review*, and *Political Analysis*.