

Siemens Competition
2015 Regional Finals
Massachusetts Institute of Technology Judges



Dr. Sonal Jhaveri, Lead Judge

Dr. Jhaveri's early training was in Physics and Math (BS Physics, M.I.T. '70), after which she moved to graduate work in Psychology (MS, M.I.T., '72) and Neuroscience (PhD Anatomy, Harvard University); she was *Senior Research Scientist* at MIT, with an interest in Developmental Neuroscience. Currently, she is a *Senior Lecturer* in the Department of Brain and Cognitive Sciences and *Director of Building 46 Postdoc Affairs*, at M.I.T., and *Science Program Director* in the Postdoctoral and Graduate Student Affairs Office at the Dana-

Farber Cancer Institute. Dr. Jhaveri has many years of experience with free-lance medical and science writing and editing, teaches writing and science communication to undergraduate, graduate and medical students as well as to postdocs, and oversees professional development training for postdoctoral fellows at MIT as well as at Dana-Farber Cancer Institute.



Dr. Ali Khademhosseini

Dr. Ali Khademhosseini received his Ph.D. in bioengineering from MIT (2005), and MAsC (2001) and BAsC (1999) degrees from University of Toronto both in chemical engineering. He is Professor of Medicine at Harvard Medical School; Director of the Biomaterials Innovation Research Center at Brigham and Women's Hospital; faculty at the Harvard-MIT Division of Health Sciences and Technology, Associate Faculty at the Wyss Institute for Biologically Inspired Engineering; and a Junior PI at Japan's World Premier

International-Advanced Institute for Materials Research at Tohoku University, where he directs a satellite laboratory. He is recognized as a leader in combining micro- and nano-engineering approaches with advanced biomaterials for regenerative medicine applications. His laboratory has pioneered numerous technologies and materials for controlling the architecture and function of engineered vascularized tissues. He has authored over 350 journal papers (H-index =

74, ~19300 citations) and 50 books/chapters, and delivered 250+ invited/keynote lectures. Dr. Khademhosseini's interdisciplinary research has been recognized by over 30 major national and international awards. He is a recipient of the Presidential Early Career Award for Scientists and Engineers, the highest honor given by the US government for early career investigators. He is also a fellow of the American Institute of Medical and Biological Engineering (AIMBE) and the American Association for the Advancement of Science (AAAS). He serves on the editorial board of numerous leading journals, is an Associate Editor for ACS Nano (IF: 12) and a permanent member of NIH BTSS study section. Read more at: <http://www.tissueeng.net/>



Dr. Stuart Licht

Dr. Stuart Licht is a laboratory head in the Biochemistry and Bioanalytics group within the Oncology division of Sanofi. His lab studies the mechanism and drug sensitivity of enzymes involved in cancer. Dr. Licht previously worked at Novartis, where he was a lab head in the Biologics group in Cardiovascular and Metabolic Diseases; his lab at Novartis focused on the design, expression, and purification of protein drug candidates and tool proteins for small-molecule drug discovery. Prior to joining Novartis, Dr. Licht was an assistant professor in the Department of Chemistry at MIT, where his research focused on mechanistic studies of energy-dependent proteases and biophysics of ligand-gated ion channels. Dr. Licht did his doctoral work in chemistry at MIT and carried out postdoctoral studies in single-molecule biophysics at UC Berkeley, Scripps, and the State University of New York, Buffalo.



Dr. Denis Martynov.

Dr. Martynov obtained his PhD from the California Institute of Technology (Physics/Mathematics and Astronomy), where his thesis was focused on the detection of gravitational waves from distant astrophysical sources, with the LIGO (Laser Interferometer Gravitational-Wave Observatory) group. He then moved to MIT's Kavli Institute for Astrophysics and Space Research as a postdoctoral scholar. His current work involves precision measurements made with the use of lasers, experimental research on detection of gravitational waves, and use of radiowaves to probe cosmic dust (21cm astronomy).



Dr. Haynes Miller

Dr. Haynes Miller received his PhD in 1974 from Princeton University and has been at MIT since 1986. His field of research is Algebraic Topology, and he has published numerous articles on the subject and served in a variety of editorial capacities, including editor-in-chief of the Bulletin of the American Mathematical Society (1994-1999). He has directed 23 PhD theses. His undergraduate teaching includes the major MIT undergraduate differential equations course (18.03), which he is now teaching for the tenth time. He led the creation of the Mathematics Department's Institute Laboratory course 18.821, and has served Mathematics Education Officer from 2004 to 2013. Recognition of Professor Miller's educational efforts include a MacVicar Faculty Fellowship (2005--2014) and School of Science Graduate teaching award (2006). He served from 2001 to 2013 as the Mathematics liaison for the Cambridge-MIT Exchange, and was a member of the Presidential Task Force on the Undergraduate Educational Commons (2004--2006). He serves on the Faculty Advisory Board of MIT OpenCourseWare, and on the American Mathematical Association's Committee on Education.



Dr. Robert Penna

Dr. Robert Penna is a Pappalardo Fellow in Physics at MIT. He studied math and physics at the University of Rochester, completed Part III maths at the University of Cambridge, and obtained his Ph.D. in Astrophysics at Harvard University. Bob is interested in general relativity, magnetohydrodynamics, and their astrophysical applications. He has studied black hole accretion disks and jets using large scale numerical simulations and analytical tools. Currently, Bob is interested in using astrophysics to test new ideas about black holes and general relativity.



Dr. Michael Prerau

Dr. Michael Prerau (Judge) is a Postdoctoral Research Fellow at Harvard Medical School in the Massachusetts General Hospital Department of Anesthesia, Critical Care, and Pain Medicine, and a Research Affiliate at MIT in the Department of Brain and Cognitive Sciences under Drs. Emery Brown and Patrick Purdon. He received his Ph.D. in computational neuroscience from Boston University in 2010. He holds both a Masters in biomedical engineering (2003) and a B.S. in computer science/artificial intelligence (2002) from Columbia University. His current work focuses on understanding the mechanisms of sleep and general anesthesia, and on the development of real-time signal processing algorithms for neural monitoring.



Dr. Alex K. Shalek

Dr. Alex K. Shalek is currently the HLF von Helmholtz Career Development Assistant Professor of Health Sciences and Technology at MIT, as well as a Core Member of the Institute for Medical Engineering and Science (IMES) and an Assistant Professor of Chemistry. He also is an Associate Member of the Ragon and Broad Institutes, and an Assistant in Immunology at MGH. His research is directed towards the development and application of new technologies that facilitate understanding of how cells collectively perform systems-level functions in healthy and diseased states. Dr. Shalek received his bachelor's degree summa cum laude from Columbia University and his Ph.D. from Harvard University in chemical physics under the guidance of Hongkun Park. To date, his interdisciplinary research has focused on developing and utilizing nanoscale manipulation and measurement technologies to examine how small components (molecules, cells) drive systems of vast complexity (cellular responses, population behaviors).

Dr. Pawan Sinha



Dr. Pawan Sinha has earned a variety of academic and industry honors, including the Pisart Vision Award from the Lighthouse Guild, the PECASE – US Government’s highest award for young scientists, the Troland Award from the National Academies, the inaugural Asia GameChangers Award from AsiaSociety, the Oberdorfer Award from ARVO Foundation, and the Distinguished Alumnus Award from the Indian Institute of Technology,

New Delhi. He received a B.Tech. from IIT Delhi, and then came to MIT for his M.S., Ph.D., and post-doctoral training. He joined the MIT faculty in 1999. Sinha is an inventor, and an accomplished cartoonist, who penned an award-winning comic strip called "Tumbleweed Garden" for the MIT student newspaper. Research in his lab seeks to understand how the brain learns to recognize the patterns and scenes we see around us. To do this, his group not only uses computers to model the processes of the human brain, but also studies human subjects, some of whom are seeing the world for the very first time and can tell them about the experience as it happens. They find these unusual subjects through the humanitarian branch of their research, Project Prakash.



Dr. Agi Stachowiak

Dr. Agi Stachowiak is regulatory writer at Synchrogenix, where she authors documents related to clinical trials and drug submissions. She has experience in diverse therapeutic areas, including oncology, respiratory disorders, and neurological disorders. Previously, Dr. Stachowiak was an instructor in the Department of Biological Engineering at MIT. In this role, she taught a molecular biology laboratory class that emphasized design, quantitative analysis, and both

written and oral scientific communication; led departmental teaching assistant training; and contributed to other pedagogical initiatives. Dr. Stachowiak has two degrees from MIT: an S.B. in Chemical Engineering and a Ph.D. in Polymer Science and Engineering. Her doctoral research involved the development of polymer scaffolds for studying immune cell behavior, which inspired her interest in applying engineering to biology.