Day 1 - Monday, September 21, 1:00 PM – 5:00 PM

1:00 PM  Welcoming remarks
Brian Anthony
Associate Director, MIT.nano
Principal Research Scientist
Department of Mechanical Engineering
Institute for Medical Engineering and Science

Dr. Anthony has over 25 years of commercial, research, and teaching experience in product realization. His research and product development interests cross the boundaries of manufacturing and design, computer vision, acoustic and ultrasonic imaging, large-scale computation and simulation, optimization, metrology, autonomous systems, and robotics. His teaching interests include the modeling of large-scale systems in a wide variety of decision-making domains and the development of optimization algorithms and software for analyzing and designing such systems. He has extensive experience in market driven technology innovation, product realization, and business entrepreneurship and commercialization at the intersection between information technology and advanced manufacturing.

Dr. Anthony spent the first part of his career as an entrepreneur. He developed and directed the development of products and solutions for the industrial and scientific video markets. His products fueled corporate growth from startup to dominant market leader. He won an Emmy in broadcast technical innovation.

1:10 PM  Keynote address

1:40 PM  Peek into research
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Ashwin Gopinath joined MIT in January 2019 as an assistant professor in Mechanical Engineering where his lab is working on projects at the intersection of molecular self-assembly, surface-chemistry, CMOS nanofabrication, and synthetic biology. Dr. Gopinath earned his PhD in electrical engineering from Boston University for his work on understanding light transport in disordered media. Subsequently, he was a senior research scientist at Caltech and then a research scientist at Google [X]. Dr. Gopinath has co-authored 21 papers in journals including Nature, Science and PNAS as well as received several awards, most recent of which is the 2017 Robert Dirk Prize in Molecular Programming for his seminal contributions in merging DNA nanotechnology with conventional semiconductor nanofabrication.

Arrays of individual molecules or nanoparticles can combine the advantage of microarrays and single-molecule experiments. They facilitate miniaturized high-throughput assays with low sample and reagent consumption while also revealing heterogeneity hidden in ensemble measurements. However, creating single molecule arrays are particularly difficult since conventional nano-fabrication techniques can't be used to organize individual molecules onto defined positions on a substrate. In this context 'DNA origami placement' is an appealing technique as it allows any molecule (or nanoparticle) that can be labeled with DNA to be organized on arbitrary substrates using standard lithographic processes. The challenge now becomes one of reducing cost, developing applications, and increasing the capabilities.

In this talk, Gopinath will introduce a bench-top technique to create cm-scale DNA origami nanoarrays that does not require any nanopatterning step, at a cost of $1 per cm² and Gopinath will also discuss the application of this technique for point-of-care diagnostics. Finally, Gopinath will end by introducing strategies for performing non-aqueous organic reaction on immobilized DNA origami for creating arrays of extremely hydrophobic molecules.
This lecture will focus on the design of systems wherein reconfiguration of complex liquid emulsions (droplets) can be triggered chemically or biochemically. The utility of these methods is to generate new transduction mechanisms by which chemical and biological sensors can be developed. Complex liquid droplets behave as optical lens systems and small changes in surface tensions can change focal lengths or cause systems to switch between optically transmissive or scattering states. Central to this scheme is that the fluids in the droplets have different densities and hence are aligned by the earth's gravity. The induced optical changes can be triggered with chemical, photochemical, or biochemical stimuli and thereby create new generations of sensors. Demonstrations of these methods for the detection of proteins, antibodies, and pathogens will be presented.
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To understand the function and dynamics of the nervous system, and to find treatments for the neurological and psychiatric conditions that increasingly affect our aging society, new tools capable of addressing neuronal signaling complexity are urgently needed. These tools must also match the mechanical and chemical properties of the neural tissue to avoid foreign body response and functional perturbation to local circuits. By leveraging fiber-drawing methods from the telecommunications industry, our group creates flexible and stretchable probes capable of recording and stimulation of neural activity as well as delivery of drugs and genes into the brain and spinal cord. We use these probes to interrogate brain circuits, such as those involved in anxiety and fear, and to promote recovery following spinal cord and nerve injury. Simultaneously, we develop a broad range of magnetic nanotransducers that convert externally applied magnetic fields into thermal, chemical, and mechanical signals, which can then be perceived by ion channels on neurons. Since biological tissues exhibit negligible magnetic permeability and low conductivity, magnetic fields can penetrate deep into the body with no attenuation, allowing us to apply the nanomagnetic transducers to remotely control deep brain circuits associated with reward and motivation, as well as adrenal circuits involved in regulation of corticosterone and (nor)epinephrine release.
Non-Contact Laser Ultrasound
Xiang (Shawn) Zhang
Postdoctoral Associate
Computational Instrumentation Lab
Mechanical Engineering

Xiang (Shawn) Zhang
Postdoctoral Associate
Computational Instrumentation Lab
Mechanical Engineering

Xiang (Shawn) Zhang is a Postdoctoral Associate in the Computational Instrumentation Lab advised by Dr. Brian Anthony. Shawn’s research focuses on non-contact laser ultrasound and design of novel systems to enhance/extend ultrasound beyond present capabilities. Shawn completed his Ph.D. and Master’s at MIT in Mechanical Engineering with research focusing on non-contact ultrasound, including laser ultrasound and ultrasound tomography. Shawn received his undergraduate degree in Mechanical Engineering at the University of Maryland-College Park (UMCP); during which he completed a co-op at National Institute of Standards and Technology (NIST) designing the Watt Balance to redefine the SI kilogram. Outside of research, Shawn was a mentor at MIT MakerWorkshop and a team lead for MIT Hyperloop.

Full non-contact laser ultrasound (LUS) imaging has several distinct advantages over current medical ultrasound (US) technologies: elimination of coupling mediums (gel/water), operator-independent image quality, improved repeatability, and volumetric imaging. Current light-based ultrasound utilizing tissue penetrating photoacoustics (PA) generally uses traditional piezoelectric transducers in contact with the imaged tissue or carries an optical fiber detector close to the imaging site. Unlike PA, LUS minimizes optical penetration and specifically restricts optical to acoustic energy transduction at the tissue surface, maximizing the generated acoustic source amplitude. LUS operates analogous to conventional ultrasound by using light to replace piezoelectric elements. Experimental LUS images at ~5 cm image depths with meter scale standoff successfully demonstrates the feasibility of LUS for human imaging at eye and skin safe optical exposure levels. First human LUS images inspire further LUS development and is a significant step toward clinical implementation of LUS.
Hand-Held Magnetic Resonance Imaging
Jacob K. White
Professor of Electrical Engineering and Computer Science

Professor Jacob K. White has been a faculty member at MIT since 1987, is currently the C.H. Green Professor in Electrical Engineering and Computer Science, and recently became a MacVicar Faculty Fellow. His research area is in numerical algorithms and software for engineering design, and his current focus is on using novel combinations of computation and commodity hardware to develop medical and educational technology with minimal economic barriers.

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The costs and complex infrastructure for high-field (> 1.5 Tesla) magnetic resonance (MR) imaging have relegated this extremely-safe and remarkably-revealing clinical tool to high-end hospital care. Recently-developed low-field MR imagers (0.05 to 0.2 Tesla) are changing this situation, because they can accurately image an adult brain, yet are portable enough to wheel to an ICU or NICU.

In this talk, White will discuss his group’s nascent effort to go even further—an imager that a clinician could slide over an arm (or a leg, or an infant’s head), and “see beneath the skin” in real time. White will start by describing the techniques used in their $100, student-assembleable, finger-sized imager, and then discuss the daunting challenges in moving beyond their very small educational device.

4:05 PM
Panel Q&A

4:25 PM
Peek into research

4:30 PM
Closing remarks

Day 2 - Tuesday, September 22, 1:00 PM – 5:00 PM
Welcoming remarks
Brian Anthony
Associate Director, MIT.nano
Principal Research Scientist
Department of Mechanical Engineering
Institute for Medical Engineering and Science

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Keynote

Peek into research
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Rapid Antigen Diagnostics for Emerging Pathogens
Lee Gehrke
Hermann L.F. von Helmholtz Professor of Health Sciences

Lee Gehrke is Hermann L.F. von Helmholtz Professor of Health Sciences at MIT and Professor of Microbiology at Harvard Medical School. His laboratory studies host-pathogen interactions in virus infections, in addition to developing rapid antigen diagnostics for human viral infections, including dengue virus, Zika virus, Chikungunya virus, and SARS-CoV-2. The goal of the rapid test development is to design rapid, inexpensive, easy to use tests that can be scaled for use anywhere in the world without need for power, special chemicals, or special training.

A large number of animal species are hosts to viruses in geographic areas that have historically been separated from humans. With climate change, deforestation, and increased urbanization, what was once rare human contact with these pathogens is increasing, leading to spillover events that cause emerging virus infections. Rapid diagnostic tests are needed for population surveillance to identify circulating pathogens, as well as to serve health care workers in detecting and distinguishing pathogens for optimal patient care. The goal of our work is to develop low cost tests that are simple to use, do not require power, and do not require special chemicals. In COVID19 disease, the absence of a vaccine means that active vigilance, accomplished by regular testing (every 2-3 days) is required to prevent superspreader transmission. This regular testing requires an inexpensive test that can be used as a point-of-care diagnostic. We are actively pursuing technologies to reduce the cost of developing rapid antigen tests, permitting advance diagnostics development that precedes outbreaks and epidemics.

TBA
Giovanni Traverso
Karl Van Tassel (1925) Career Development Professor
Mechanical Engineering
Giovanni Traverso
Karl Van Tassel (1925) Career Development Professor
Mechanical Engineering

Giovanni Traverso is an Assistant Professor in the Department of Mechanical Engineering at the Massachusetts Institute of Technology (MIT) and also a gastroenterologist in the Division of Gastroenterology, Brigham and Women’s Hospital (BWH), Harvard Medical School. Dr. Traverso grew up in Peru, Canada and the United Kingdom. He received his BA from Trinity College, University of Cambridge, UK, and his PhD from the lab of Prof. Bert Vogelstein at Johns Hopkins University. He subsequently completed medical school at the University of Cambridge, internal medicine residency at the Brigham and Women’s Hospital and his gastroenterology fellowship training at Massachusetts General Hospital, both at Harvard Medical School. Dr. Traverso’s previous work focused on the development of novel molecular tests for the early detection of colon cancer. For his post-doctoral research, he transitioned to the fields of chemical and biomedical engineering in the laboratory of Professor Robert Langer at MIT where he developed a series of novel technologies for drug delivery as well as physiological sensing via the gastrointestinal tract.

His current research program is focused on developing the next generation of drug delivery systems to enable safe and efficient delivery of therapeutics as well developing novel ingestible electronic devices for sensing a broad array of physiologic and pathophysiologic parameters. Additionally, Dr. Traverso continues his efforts towards the development of novel diagnostic tests that enable the early detection of cancer.
Canan Dagdeviren is the LG Career Development Professor of Media Arts and Sciences at MIT Media Lab, where she leads the Conformable Decoders research group. The group aims to convert the patterns of nature and the human body into beneficial signals and energy.

Dagdeviren earned her Ph.D. in Materials Science and Engineering from the University of Illinois at Urbana-Champaign, where she focused on exploring patterning techniques and creating piezoelectric biomedical systems. Her collective Ph.D. research involved flexible mechanical energy harvesters, multi-functional cardiac vessel stents, wearable blood pressure sensors, and stretchable skin modulus sensing bio-patches.

https://www.media.mit.edu/people/canand/overview/

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The rapid advancement of electronic devices and fabrication technologies has further promoted the field of wearables and smart textiles. However, most of the current efforts in textile electronics focus on a single modality and cover a small area. In this work, we introduce a new platform of modular, conformable (i.e., flexible and stretchable) distributed sensor networks that can be embedded into digitally-knit textiles. This platform can be customized for various forms, sizes, and functions using standard, accessible, and high-throughput textile manufacturing and garment patterning techniques. Here, we have developed a tailored, electronic textile conformable suit (E-TeCS) to perform large-scale, multi-modal physiological (temperature, heart rate, and respiration) sensing in vivo.
Dr. Michael J. Cima is the David H. Koch Professor of Engineering and a Professor of Materials Science and Engineering at the Massachusetts Institute of Technology and has an appointment at the David H. Koch Institute for Integrative Cancer Research. He earned a B.S. in chemistry in 1982 (phi beta kappa) and a Ph.D. in chemical engineering in 1986, both from the University of California at Berkeley. Prof. Cima joined the MIT faculty in 1986 as an Assistant Professor. He was promoted to full Professor in 1995. He was elected a Fellow of the American Ceramics Society in 1997. Prof. Cima was elected to the National Academy of Engineering in 2011. He now holds the David H. Koch Chair of Engineering at MIT. He was appointed faculty director of the Lemelson-MIT Program in 2009 which is a program to inspire youth to be inventive and has a nationwide reach. In 2018, Cima was named a co-director of MIT's Innovation Initiative and the associate dean of innovation for the School of Engineering.

Prof. Cima is author or co-author of over two hundred peer reviewed scientific publications, thirty seven US patents, and is a recognized expert in the field of materials processing. Prof. Cima is actively involved in materials and engineered systems for improvement in human health such as treatments for cancer, metabolic diseases, trauma, and urological disorders. Prof. Cima’s research concerns advanced forming technology such as for complex macro and micro devices, colloid science, MEMS and other micro components for medical devices that are used for drug delivery and diagnostics, high-throughput development methods for formulations of materials and pharmaceutical formulations. He is a coinventor of MIT’s three dimensional printing process. His research has led to the development of chemically derived epitaxial oxide films for HTSC coated conductors. He and collaborators are developing implantable MEMS devices for unprecedented control in the delivery of pharmaceuticals and implantable diagnostic systems. Finally, through his consulting work he has been a major contributor to the development of high throughput systems for discovery of novel crystal forms and formulations of pharmaceuticals.

Prof. Cima also has extensive entrepreneurial experience. He is co-founder of MicroChips Inc., a developer of microelectronic based drug delivery and diagnostic systems. Prof. Cima took two sabbaticals to act as senior consultant and management team member at Transform Pharmaceuticals Inc. a company that he helped start and that was ultimately acquired by Johnson and Johnson Corporation. He is a co-founder and director at T2 Biosystems a medical diagnostics company. Most recently, Prof. Cima co-founded SpringLeaf Therapeutics a specialty pharmaceutical company and Taris Biomedical a urology products company.

We recently discovered in a human clinical trial that the MR signal originating from skeletal muscle is an absolute measure of excess volume in end-stage renal disease (ESRD) patients undergoing hemodialysis (HD). HD patients are prescribed a volume of fluid to be removed by ultrafiltration during their dialysis session based on an assumed “dry weight”. Current real-time assessment measures include hematocrit with the objective of keeping it constant. The vascular volume is maintained during dialysis using this technology. Hematocrit does not, however, provide a measure of how close the patient is to his/her dry weight. Clinical signs and symptoms are used to identify hypovolemia due to excessive fluid withdrawal. These non-specific indicators often lag behind the onset of hypovolemia and their presentation is highly variable between patients. Excessive fluid removal during HD is associated with nausea, vomiting, cramping, and chest pain. We have constructed a sensor that will measure the tissue relaxivity of muscle without the need for an MRI. This bedside instrument is portable and compatible with the dialysis suite. Our goal is to improve management of ESRD patient during HD and ultimately improve outcomes.
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THOMAS F. QUATIERI
Senior Staff, Human Health and Performance Systems Group, Lincoln Laboratory

Thomas F. Quatieri received his B.S. degree (summa cum laude) from Tufts University in Medford, MA, and S.M., E.E., and Sc.D. degrees from the Massachusetts Institute of Technology (MIT) in Cambridge, MA. He is a senior member of the technical staff with MIT Lincoln Laboratory, Lexington, focused on speech and auditory signal processing and neurobiophysical modeling with application to detection and monitoring of neurological, neurotraumatic, and stress conditions.

Dr. Quatieri holds a faculty appointment in the Harvard-MIT Speech and Hearing Bioscience and Technology Program. He is an author on more than 200 publications, holds 12 patents, and authored the textbook Discrete-Time Speech Signal Processing: Principles and Practice. He is a recipient of four IEEE Transactions Best Paper Awards and the 2010 MIT Lincoln Laboratory Best Paper Award. He led the Lincoln Laboratory team that won the 2013 and 2014 AVEC Depression Challenges and the 2015 MIT Lincoln Laboratory Team Award for their work on vocal and facial biomarkers. He served on many IEEE technical committees and the IEEE James L. Flanagan Speech and Audio Awards Committee. He has also served on the editorial board of the IEEE Transactions on Signal Processing, and is currently an associate editor of Computer, Speech, and Language. He co-led the mHealth group on Monitoring COVID Patients and Clinical Personnel under the Mass General Brigham Center for COVID Innovation. He is a Fellow of the IEEE and a member of Tau Beta Pi, Eta Kappa Nu, Sigma Xi, ICSA, and ASA.

A framework is proposed to detect and track COVID-19 based on changes in neuromotor coordination across speech subsystems involved in respiration, phonation, and articulation. The approach is motivated by evidence of widespread inflammation of COVID-19 throughout the body including lower (i.e., bronchial tubes, diaphragm, lower trachea) and upper (i.e., laryngeal, pharyngeal, oral and nasal) tract injury, as well as by the growing evidence of the virus’ neurological impact. An exploratory study is described involving a small set of pre-COVID-19 (pre-exposure) versus post-COVID-19 (after positive diagnosis but presumed asymptomatic) audio interviews and a larger cohort of control versus post-COVID-19 participants in an online protocol designed by Voca.ai in collaboration with Carnegie Mellon University.

For each cohort pair, Cohen’s d effect sizes were measured using coordination of respiration (as measured through the acoustic speech envelope) and laryngeal motion (fundamental frequency and cepstral peak prominence), and coordination of laryngeal and articulatory (formant center frequencies) motion. While there is a strong subject-dependence, group-level morphology of effect sizes indicates a reduced complexity of subsystem coordination. For the later (larger) cohort, an encouraging detection/false alarm tradeoff was estimated using a Gaussian mixture-based classifier. Validation is needed with larger more controlled datasets and addressing confounding influences such as different recording conditions, unbalanced data quantities, and changes in underlying vocal status from pre-to-post time recordings including changes in emotional state.
An architect and engineer by training, Professor Carlo Ratti teaches at MIT, where he directs the Senseable City Laboratory, and is a founding partner of the international design and innovation practice Carlo Ratti Associati. A leading voice in the debate on new technologies’ impact on urban life, his work has been exhibited in several venues worldwide, including the Venice Biennale, New York’s MoMA, London’s Science Museum, and Barcelona’s Design Museum. Two of his projects – the Digital Water Pavilion and the Copenhagen Wheel – were hailed by Time Magazine as “Best Inventions of the Year.” He has been included in Wired Magazine’s “Smart List: 50 people who will change the world.” He is currently serving as co-chair of the World Economic Forum’s Global Future Council on Cities and Urbanization, and as special advisor on Urban Innovation to the European Commission.
Fighting COVID-19 Misinformation on Social Media
David Rand
Erwin H. Schell Associate Professor of Management Science
MIT Sloan School of Management

David Rand is the Erwin H. Schell Professor and Associate Professor of Management Science and Brain and Cognitive Sciences at MIT. Bridging the fields of cognitive science, behavioral economics, and social psychology, David’s research combines behavioral experiments and online/field studies with mathematical/computational models to understand human decision-making. His work focuses on illuminating why people believe and share misinformation and “fake news”; understanding political psychology and polarization; and promoting human cooperation. His work has been published in peer-reviewed journals such as Nature, Science, PNAS, the American Economic Review, Psychological Science, Management Science, and the American Journal of Political Science, and has received widespread media attention. He has also written for popular press outlets including the New York Times, Wired, and New Scientist. He was named to Wired magazine’s Smart List 2012 of “50 people who will change the world,” chosen as a 2012 Poynter Science Fellow, received the 2015 Arthur Greer Memorial Prize for Outstanding Scholarly Research, was selected as fact-checking researcher of the year in 2017 by the Poynter Institute’s International Fact-Checking Network, and received the 2020 FABBS Early Career Impact Award from the Society for Judgment and Decision Making. Papers he has coauthored have been awarded Best Paper of the Year in Experimental Economics, Social Cognition, and Political Methodology.

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The COVID-19 pandemic represents a substantial challenge to global human well-being. Not unlike other challenges (e.g., global warming), the impact of the COVID-19 pandemic depends on the actions of individual citizens and, therefore, the quality of the information to which people are exposed. Unfortunately, however, misinformation about COVID-19 has proliferated, including on social media. In this talk, Rand will present evidence that people share false claims about COVID-19 partly because they simply fail to think sufficiently about whether or not the content is accurate when deciding what to share.

In a first study, participants were far worse at discerning between true and false content when deciding what they would share on social media relative to when they were asked directly about accuracy. Furthermore, greater cognitive reflection and science knowledge were associated with stronger discernment. In a second study, we found that a simple accuracy reminder at the beginning of the study (i.e., judging the accuracy of a non-COVID-19-related headline) nearly tripled the level of truth discernment in participants’ subsequent sharing intentions. Our results, which mirror those found previously for political fake news, suggest that nudging people to think about accuracy is a simple way to improve choices about what to share on social media.

4:05 PM Panel Q&A

4:25 PM Peek into research

4:30 PM Closing remarks

Day 3 - Wednesday, September 29, 1:00 PM – 4:00 PM
Dr. Anthony has over 25 years of commercial, research, and teaching experience in product realization. His research and product development interests cross the boundaries of manufacturing and design, computer vision, acoustic and ultrasonic imaging, large-scale computation and simulation, optimization, metrology, autonomous systems, and robotics. His teaching interests include the modeling of large-scale systems in a wide variety of decision-making domains and the development of optimization algorithms and software for analyzing and designing such systems. He has extensive experience in market driven technology innovation, product realization, and business entrepreneurship and commercialization at the intersection between information technology and advanced manufacturing.

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Panel discussion: Needs and innovation
Michael Cima

David H. Koch Professor of Engineering
MIT Koch Institute for Integrative Cancer Research

Michael Cima

David H. Koch Professor of Engineering
MIT Koch Institute for Integrative Cancer Research

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Amy Moran-Thomas
Alfred Henry and Jean Morrison Hayes Career Development Associate Professor of Anthropology at MIT

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Amy Moran-Thomas is Alfred Henry and Jean Morrison Hayes Career Development Associate Professor of Anthropology at MIT. Her research bridges the anthropology of health and environment (chronic disease; ecological and agricultural change; metabolism and nutrition) with ethnographic studies of science and technology (medical devices; chemical infrastructures; technology and kinship). She is the author of the book Traveling with Sugar: Chronicles of a Global Epidemic (2019), and teaches courses on “The Social Lives of Medical Objects” at MIT.

View full bio
Timothy Swager
John D. MacArthur Professor of Chemistry
Director, Deshpande Center for Technological Innovation
MIT Department of Chemistry

Timothy Swager
John D. MacArthur Professor of Chemistry
Director, Deshpande Center for Technological Innovation
MIT Department of Chemistry
2:00 PM
MIT Startup Exchange Presentations

**Empatica** - AI systems to monitor human health through wearable sensors - [https://www.empatica.com/](https://www.empatica.com/)

**C2Sense** - Miniaturized mobile sensing solutions for a healthier and safer world - [https://www.c2sense.com/](https://www.c2sense.com/)

**Dynocardia** - Wearable, continuous, non-invasive blood pressure measurement - [https://www.dynocardia.care/](https://www.dynocardia.care/)

**Lelantos** – Revolutionizing vapor sensing for threat detection, air quality monitoring and medical diagnosis - [https://www.lelantostech.com/about](https://www.lelantostech.com/about)

**Nextiles** – Smart performance and injury monitoring apparel with more accessible and scalable technology - [https://www.nextiles.tech/](https://www.nextiles.tech/)

3:00 PM
Peek into research
Panel discussion: Experiences and lessons learned from COVID-19
Tolga Durak
Managing Director of Environment, MIT Health and Safety (EHS) Programs

As MIT's Managing Director of Environment, Health and Safety (EHS) Programs, Durak is the responsible administrator for health, safety and environmental programs for all MIT academic and administrative units. Durak leads EHS to assure university activities are conducted in compliance with applicable laws, regulations, best business practices as well as by supporting development, implementation, and monitoring of prevention control strategies and initiatives. In addition to the main MIT campus, EHS provides support for and oversight over all off-site and international departments, laboratories and research centers.

Durak holds a BS in Mechanical Engineering, a MS in Industrial & Systems Engineering and a PhD in Building Construction / Environmental Design and Planning. He has over 20 years of experience in engineering and EH&S in higher education. During his career, he has served in the capacity of EHS Director, Authority Having Jurisdiction, Responsible Official, Fire Marshal, Risk Manager, Radiation Safety Officer, Laser Safety Officer, Safety Engineer, Project Manager and Emergency Manager for government agencies as well as universities with extensive healthcare and research facilities. He is a practicing professional engineer, certified safety professional, certified building and fire official and an associate in risk management. During his academic tenure, Durak held engineering and public health faculty appointments. In addition to occupational safety and health, he has research interests in building sciences with emphasis on performance, energy efficiency, retrofitting solutions, systems integration, integrated control strategies and smart building materials. Durak is a proud father of twins Sam and Sloane and a competitive rower who races nationally and internationally in masters category.

Anette (Peko) Hosoi
Professor of Mechanical Engineering and Applied Mathematics
Associate Head for Education, Mechanical Engineering
Margaret MacVicar Faculty Fellow
MIT Department of Mechanical Engineering

Anette (Peko) Hosoi is a professor of Mechanical Engineering at MIT. She received her PhD in Physics from the University of Chicago and went on to become an NSF Postdoctoral Fellow in the MIT Department of Mathematics and at the Courant Institute, NYU. She is a leader in the study of the hydrodynamics of thin fluid films and in the nonlinear physical interaction of viscous fluids and deformable interfaces. Her work spans multiple disciplines including physics, biology and applied mathematics, and is being used, in collaboration with Schlumberger-Doll Research, Bluefin Robotics, and Boston Dynamics to guide the engineering design of robotic crawlers and other mechanisms.

Prof. Hosoi is an exceptional, innovative teacher and an inspiring mentor for women in engineering. She was awarded the Ruth and Joel Spira Award for Distinguished Teaching, and a MacVicar Fellowship. She is a recipient of the 3M Innovation Award and has held the Dolgo Chair in Ocean Utilization at MIT. She is a Radcliffe Institute Fellow and a Fellow of the American Physical Society. Her research interests include fluid mechanics, bioinspired design and locomotion, with a focus on optimization of crawling gastropods, digging bivalves, swimming microorganisms and soft robotics. Prof. Hosoi is also an avid mountain biker and her passion for sports has led her to create STE@M, Sports Technology & Education at MIT. STE@M is a program that is designed to build an interconnected community of faculty, students, industry partners, alumni and athletes who are dedicated to applying their technical expertise to advance the state-of-the-art in sports.

Robert Sege
Professor of Medicine, Tufts University
Director, Center for Community Engaged Medicine
Closing remarks and looking to the future