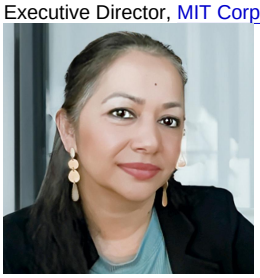
2026 MIT Japan Conference

January 23, 2026 8:15 am - 5:30 pm

8:15 AM	Registration with Light Breakfast

9:00 AM

Opening Remarks
Gayathri Srinivasan
Executive Director, MIT Corporate Relations

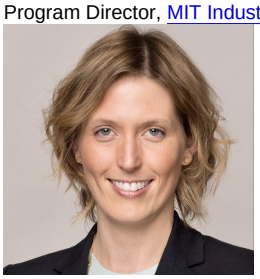


Gayathri Srinivasan
Executive Director
MIT Corporate Relations

Dr. Srinivasan is a distinguished scientist who received her PhD in Microbiology from The Ohio State University in 2004, where she contributed to the discovery of the 22nd amino acid, Pyrrolysine (2002). She first came to MIT as an NIH Postdoctoral Fellow in Prof. Tom Rajbhandary's lab, where her research focused on understanding protein synthesis mechanisms in Archaea.

Dr. Srinivasan subsequently moved into the business development and technology licensing space, serving in MIT's Technology Licensing Office, where she helped commercialize technologies in medical devices and alternative energies. She then moved to UMass Medical School's Office of Technology Management in 2009 and to Emory University in Atlanta in 2014 as the Director of Public and Private Partnerships for the Woodruff Health Sciences Center. In 2019, Dr. Srinivasan joined Emory's Office of Corporate Relations as Executive Director, and in 2021, she led the Office of Corporate and Foundation Relations.

Rebekah Miller
Program Director, MIT Industrial Liaison Program



Rebekah Miller
Program Director
MIT Industrial Liaison Program

Rebekah Miller joined the Office of Corporate Relations team as a Program Director in March 2022. Rebekah brings to the OCR expertise in the life sciences and chemical industries as well as in applications including sensors, consumer electronics, semiconductors and renewable energy.

Prior to joining the OCR, Rebekah worked for over a decade at Merck KGaA, most recently as a Global Key Account Manager in the Semiconductor division. Rebekah also served as Head of Business and Technology Development for the Semiconductor Specialty Accounts, during which time she led strategic planning and technology roadmapping.

While at Merck KGaA, Miller established a strong track record in industry-university partnerships, corporate entrepreneurship, and innovation management, with experience in roles spanning Technology Scouting, Alliance Management, and New Business Development. Early in her career, she led early phase R&D projects as a member of the Boston Concept Lab, which focused on technology transfer from academia.

Miller earned her B.A. in Chemistry and Biology from Swarthmore College and her Ph.D. in Chemistry, with a Designated Emphasis in Nanoscale Science and Engineering, from the University of California, Berkeley. She first joined MIT as a postdoctoral associate in the Bioengineering and Material Science Departments.

9:15 AM

NextGen-AI for Engineering Design

Faez Ahmed

Generative AI is reshaping many industries by offering innovative approaches to creating content. While LLM and VLM tools like ChatGPT have proven effective in multimedia, their application in engineering faces unique challenges, such as maintaining precision under varying requirements. This talk will explore some of these challenges, with an emphasis on achieving designs that are innovative, feasible, and achieve high functional performance. We will examine case studies across various engineering disciplines, such as kinematic design and topology optimization. Furthermore, we will explore how precision-focused generative AI can transcend mere mimicking of statistical patterns to address performance, constraints, and innovation in engineering. The talk will show examples of AI-driven design co-pilots for engineering tasks, along with covering methods that effectively combine multimodal generative models with engineering optimization and tools, highlighting how this fusion augments the design process. The presentation will conclude by highlighting the broader impact of generative AI in facilitating design democratization and fostering rapid innovation across the engineering sector.

9:45 AM

Next-Generation Nanofabrication for Health and Technology

Mark Bathe

Nucleic acids are conventionally known as molecular carriers of genetic information, the blueprint for life. Alternatively, nucleic acids can be used to fabricate complex 2D and 3D molecular assemblies with unprecedented nanometer-scale precision that replicates, and goes beyond, highly evolved naturally biological assemblies. In this talk, I will illustrate how we have used DNA-based virus-like particles (DVLPs) to elicit a potent immunological response that surpasses a clinical protein-based equivalent VLP due to the inert, immunologically silent nature of DNA. I will discuss how this next-generation DVLP platform opens up numerous possibilities in active immunotherapies for challenging infectious diseases as well as central nervous system disorders. Next, I will demonstrate how programmable DNA sequences can be used to encode complex “wet” databases of information, akin to a Google Books search engine for molecules. I will apply this database system to storing human and viral genomes at room temperature, bypassing the need for cold-chain logistics that currently limit global genomics to a very small fraction of the globe and global population. Finally, I will illustrate how lithographic semiconductor patterning can be used to interface organics with inorganics by using DNA to pattern single quantum emitters with nanometer-scale precision on chip-scale silicon wafers for quantum applications. I will highlight translational stories from these areas as our inventions at MIT transform into industrial innovations through start-ups cofounded by Bathe and lab members to impact the US and global economies.

10:15 AM

Introducing MIT Learn

Kathleen Kennedy

By bringing together MIT’s digital learning portfolio and embedding AI-driven capabilities, MIT Learn is a platform for continuous, adaptive, and lifelong learning for the world.

10:25 AM

Networking Break

10:55 AM

Wiring the Winning Organization: How Great Leaders Liberate Collective Intelligence to Generate and Deliver More and Better Value, Faster and with More Certainty

Steven Spear

As early as the 1970s and early 1980s, Japanese firms revealed a striking competitive paradox. Their best wasn't succeeding by making "the right tradeoffs" among quality, cost, features, and speed. Instead, they were delivering products of higher quality, with more variety, at lower cost, and at faster speed—while appearing to exert less effort. It was as if they were playing an entirely different game.

Close study revealed "the secret." While much of the industrial world focused on optimizing the flow of materials through machines with fancy math, with people as an afterthought, the best created conditions in which people could solve hard problems, develop outstanding solutions, and deliver exceptional value to society. Everyone else was competing on brawn power; they were winning on brain power.

Amidst today's turbulence—political realignments, economic disruptions, and rapid technological change—this approach to sustaining competitive advantage—seeing and solving problems better and faster than anyone else—is even more vital.

This talk explores how the best do this, by making problem solving easier to do, problems easier to solve, and problems easier to see earlier and more often, before they grow big. Examples will include both historical lessons from the pioneers and contemporary applications of these same principles.

11:25 AM

MIT Startup Exchange Lightning Talks

Harshit Gupta

Scott Nill

Edward Chung

Marcie Black

Alexander O'Brien

Ken Sullivan

Michael Alexander

Ian Seiferling

Marco Ganouna

Arturo Deza

12:30 PM

Lunch with Startup Exhibit

1:45 PM

Identifying & Counteracting the Impact of Environment Stresses on Tissue Dysfunction

Alex Shalek

During chronic stress, cells must support both tissue function and their own survival. Hepatocytes perform metabolic, synthetic, and detoxification roles; with chronic nutrient imbalances, metabolic stress can precipitate metabolic dysfunction-associated steatotic liver disease (MASLD, formerly NAFLD/NASH). Despite prior work on stress-induced drivers of hepatocyte death, the functional impact of chronic stress on surviving cells remains unclear. In my talk, I will discuss how we used cross-species longitudinal single-cell multi-omic profiling to show that ongoing stress drives developmental and cancer-associated programs in non-transformed hepatocytes while reducing mature functional identity – significantly before transformation and predicting worsened human survival. Further, I will outline how we developed and applied integrative computational methods and experimental validations to uncover master regulators perturbing hepatocyte functional balance, increasing proliferation under stress, and directly priming future tumorigenesis. I will also explain how we utilized human tissue microarray spatial transcriptomics and geographic regression to reveal spatially-structured multicellular communities and signaling interactions shaping stress responses. Finally, toward counteracting these core mechanisms driving tissue dysfunction and instability, I will present our development of a new information-rich, high-throughput phenotypic screening platform, with reduced required sample, labor, and cost requirements, that can be leveraged to help discover strategies to improve tissue health and resilience.

2:15 PM

Seeing with Invisible Photons: Chip-Scale Technologies Leveraging the Unseen Spectrum

Juejun (JJ) Hu

Infrared photons, though invisible to the human eye, are rapidly moving to the forefront of technology, enabling breakthroughs in how we sense, measure, and see the world. In my group, we are developing chip-scale photonic technologies that render the invisible visible, turning tiny chips into powerful tools for sensing and imaging.

On the sensing front, we are creating low-cost, high-performance photonic chips that harness a wide range of optical signatures in the infrared, including Raman scattering, absorption, and refractive index perturbations. These platforms bring laboratory-grade spectroscopy into compact and robust form factors, enabling real-time detection of trace chemicals across diverse industries. Several of these technologies have already moved beyond the laboratory: InSpek is advancing process control in pharmaceutical and agri-food sectors, Lightfinder Inc. is enabling continuous monitoring in energy and chemical industries, and other platforms are addressing urgent challenges such as the detection of heavy metal contamination in water.

In parallel, we are reshaping imaging optics at the chip scale. By transforming chips into flat optical elements, we can achieve performance once thought impossible with conventional lenses. A salient example is our flat fisheye lens, now commercialized by 2Pi Inc., which provides panoramic imaging in a wafer-thin form factor. Building on this foundation, we are extending the concept further, creating optical components that conform seamlessly to curved surfaces and developing active elements that reconfigure their functions on demand through tunable materials.

Together, these advances chart a vision where invisible photons become an accessible and ubiquitous resource. From real-time chemical monitoring to adaptive infrared imaging, chip-scale photonics offers a new sensory frontier — one that blends fundamental science with tangible societal impact.

2:45 PM

Scale the Package - The Semiconductor Package is the 21st Century Transistor

Anu Agarwal

Energy consumption is at an all-time high in data centers. Enhanced microchip functionality for next-generation applications, such as AI, 6G, LiDAR etc., can no longer depend solely on shrinking the dimensions of a transistor. The semiconductor package is the 21st-century transistor, and this must be scaled to obtain high-performance systems.

Generative-AI (Gen-AI) models require massive and rapid data movement between thousands of interconnected processors (GPUs/XPUs) and memory systems. Traditional electrical interconnects, which rely on long traces on a circuit board and power-hungry pluggable optical modules, have reached their physical and energy limits. The electrical signals degrade over distance, requiring additional components like digital signal processors (DSPs) and retimers, which consume significant power and add latency.

Co-packaged optics (CPO) is essential for this recent Gen-AI-driven revolution because it directly addresses the critical bottlenecks of power consumption, bandwidth density, and latency that are crippling traditional data center architectures. CPO overcomes these limitations by integrating optical engines directly onto the same package as the processing chip (ASIC). This dramatically shortens the electrical path from centimeters to mere millimeters, allowing data to be converted to light and transmitted much more efficiently.

Through FUTUR-IC, a global research alliance, we are enabling CPO within microchip systems, with high-performance, passively assembled chip-to-chip and chip-to-fiber couplers which employ graded-index and evanescent structures, fabricated using standard complementary metal-oxide-semiconductor foundry processes.

The urgency to align microchip system performance scaling with a commercially viable manufacturing value chain dominates business and technology decisions today, as the solutions are expected to power the next 40 years of progress for the semiconductor industry.

3:15 PM

Networking Break

3:45 PM

Lessons from the Curious Spread of an Ancient Platform Innovation

Ezra W. Zuckerman Sivan

This presentation distills lessons from my book manuscript *The First Week*, which is to be completed in the next 12 months. The book focuses on a very unusual innovation: the seven-day week. The week isn't usually thought of as akin to a market or technology platform, but it-- like the calendar-- is indeed a *temporal* platform-- a way of organizing time that allows and encourages dedicated "applications" (i.e., activities and routines) to be "written" (i.e., scheduled) on it. Also, while we don't usually think of the week as an innovation, it in fact has the hallmarks of an especially difficult innovation: It was invented just once and spread in a way that is distinctive of innovations that must be experienced by a critical mass in society before they are adopted. Thus, even though week-observing communities arrived in China starting in the 8th century, it was only in the mid-19th century (beginning with the treaty ports in Japan) that the week began to be adopted in East Asia. Some of the lessons relevant to managers who want their innovations to get widely adopted are as follows: a) How important it is that early adopters be mobile, in that they take the innovation to new contexts where it might get more traction; b) How important it is that the minority of early-adopters be highly committed so as to reach a critical mass; c) How it can sometimes be unimportant that the innovation solves critical problems for the majority, just as long as it is sufficiently beneficial to adjust to the minority; d) How quickly an innovation that was long uninteresting can come to be taken for granted and naturalized; and e) The importance of platform thinking in non-technological domains.

4:15 PM

Challenges and Opportunities for Insect-Scale Autonomous Aerial Robots

Kevin Chen

Flapping-wing flight at the insect scale is incredibly challenging. Insect muscles not only power flight but also absorb in-flight collisional impact, making these tiny flyers simultaneously agile and robust. In contrast, existing aerial robots have not demonstrated these properties. Rigid robots are fragile against collisions, while soft-driven systems suffer from limited speed, precision, and controllability. In this talk, I will describe our effort in developing a new class of bio-inspired micro-flyers, ones that are powered by high bandwidth soft actuators and equipped with rigid appendages. We constructed the first heavier-than-air aerial robot powered by soft artificial muscles, which can demonstrate a 1000-second hovering flight. In addition, our robot can recover from in-flight collisions and perform somersaults within 0.10 seconds. This work demonstrates for the first time that soft aerial robots can achieve agile and robust flight capabilities absent in rigid-powered micro-aerial vehicles, thus showing the potential of a new class of hybrid soft-rigid robots. I will also discuss our recent progress in incorporating onboard sensors, electronics, and batteries.

4:45 PM

From Experience-Based to Model-Based MBX: Transformation of Teamwork in Japanese Companies

Bryan Moser

For more than 30 years in industry and academia in Japan and the US, Bryan Moser has focused on complex research and product development teamwork. In this talk, he will show how teamwork can transform from **experience-based to model-based**, especially in R&D portfolio decision-making and project management.

In previous decades, Japanese companies invested in R&D with a long-term perspective while honing their own technological capabilities, supported by government industrial policies, a stable financial system, and long-term employment practices. Corporate culture emphasized technological depth and quality improvement, especially in the manufacturing industries, leading to solid competitiveness in the international market with high quality and reliability.

However, in recent years, due to acceleration of globalization, the rapid evolution of technology, and changes in the domestic demographics, it has become difficult to compete based on traditional experience-based corporate strategies and organizational management.

Some companies, in an attempt to modernize corporate decisions and projects, have turned to digital transformation (DX). However, introduction of digital tools without changing strategy, culture, and behavior are unlikely to yield improvement. In fact, these DX systems -- while costing much -- may embed a company's processes, reducing flexibility.

Our research and years of field experience have led us to introduce "model-based transformation (MBX)" to move Japanese industry from experience-based to dynamic model-based practices. Supported by interactive, visual models and computation, MBX has been shown to improve the quality of decision-making, promote collaboration, adaptive project teamwork, and innovative discoveries in a shorter period of time.

5:15 PM

Adjournment

5:20 PM

Networking Reception with Dinner