2025 MIT Research and Development Conference

# November 18, 2025 - November 19, 2025

## Day One | Plenary Talks

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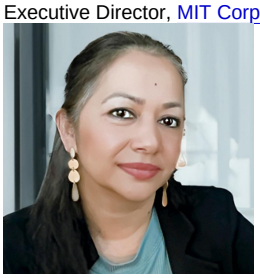
|---|---|
| 8:00 AM | Registration with Light Breakfast |

9:00 AM

Welcome and Introduction
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.

Irina Sigalovsky
Director, MIT Corporate Relations

Irina Sigalovsky
Director, MIT Corporate Relations

Irina Sigalovsky is Director of MIT Corporate Relations where she builds mutually beneficial partnerships between corporations and MIT.

Dr. Sigalovsky comes to MIT with 10 years of international experience in innovation strategy, technology forecasting and external innovation. Prior to MIT, Irina worked at GEN3 Partners, Inc. as a senior principal collaborating with Fortune 1000 companies to focus their innovation investments, execute strategic innovation agendas, and develop business globally. Throughout her career, Irina has taught at Tufts University, MIT Sloan, X-Prize Lab@MIT, MIT HST, Boston and Harvard Universities.

Irina earned her B.S. degree in Biomedical Engineering from Boston University and her Ph.D. in Neuroscience from the MIT/Harvard Medical School Division of Health Sciences and Technology (HST).

9:15 AM

Supply Chains Risk and Resilience

Yossi Sheffi

A discussion of the mechanism by which jobs are lost or modified, based on history and recent developments (supply-chain perspective)

9:45 AM

The Rise of Invisible AI-Powered Health Tech!

Dina Katabi

We face a “silver tsunami”: the number of older adults is increasing at an unprecedented rate, while shortages of both professional and family caregivers are growing. Can technology help? What if AI could analyze the wireless signals that bounce around a home and measure people’s physiological signals, diagnose new diseases, detect exacerbations of existing conditions, and track medication response, all without wearables and as patients go about their daily lives? In this talk, I will describe a new initiative focused on delivering a future in which “the Invisibles”, a new class of AI-powered contactless sensors, sit in the background of the home and enable personalized proactive and cost-effective healthcare.

10:15 AM

MIT Professional Education

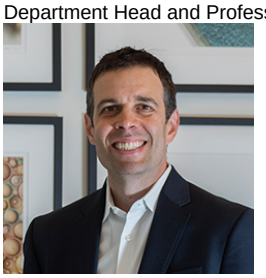
Myriam Joseph

10:20 AM

Networking Break

10:50 AM

New Manufacturing Initiative and the Future of Manufacturing
John Hart
Department Head and Professor, MIT Department of Mechanical Engineering



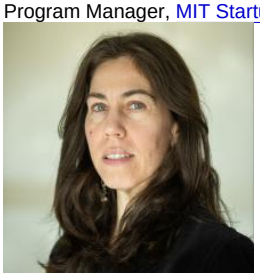
John Hart
Department Head and Professor
MIT Department of Mechanical Engineering

John Hart is Professor of Mechanical Engineering and Head of the Department of Mechanical Engineering at MIT. He is also the Director of the MIT Laboratory for Manufacturing and Productivity and the Center for Advanced Production Technologies. John’s research group focuses on the science and technology of production, including work on additive manufacturing, materials processing, automation, and computational methods. John has been recognized by awards from the United States NSF, ONR, AFOSR, DARPA, SME, and ASME, along with two R&D 100 awards. He has also received the MIT Ruth and Joel Spira Award for Distinguished Teaching in Mechanical Engineering and the MIT Keenan Award for Innovation in Undergraduate Education, for his leadership in undergraduate manufacturing education using new pedagogical models and digital resources. John is a co-founder of Desktop Metal and VulcanForms, and a Board Member of Carpenter Technology Corporation.

View full bio

11:20 AM

Startup Exchange Lightning Talks
Ariadna Rodenstein
Program Manager, MIT Startup Exchange



Ariadna Rodenstein
Program Manager
MIT Startup Exchange

Ariadna Rodenstein is a Program Manager at MIT Startup Exchange. She joined MIT Corporate Relations as an Events Leader in September 2019 and is responsible for designing and executing startup events, including content development, coaching and hosting, and logistics. Ms. Rodenstein works closely with the Industrial Liaison Program (ILP) in promoting collaboration and partnerships between MIT-connected startups and industry, as well as with other areas around the MIT innovation ecosystem and beyond.

Prior to working for MIT Corporate Relations, she worked for over a decade at Credit Suisse Group in New York and London, in a few different roles in event management and as Director of Client Strategy. Ms. Rodenstein has combined her experience in the private sector with work at non-profits as a Consultant and Development Director at New York Immigration Coalition, Immigrant Defense Project, and Americas Society/Council of the Americas. She also served as an Officer on the Board of Directors of the Riverside Clay Tennis Association in New York for several years. Additionally, she earned her B.A. in Political Science and Communications from New York University, with coursework at the Instituto Tecnológico y de Estudios Superiores de Monterrey in Mexico City, and her M.A. in Sociology from the City University of New York.

Christine Yi-Ting Wang

Zachary Kabelac

Andrew Dorne

Baptiste Bouvier

Peter Schmitt

Saket Bhargava

Khalisah Stevens

Felipe Collares Chaves

Pavel Bystricky

Sanjay Manandhar

12:20 PM

Lunch with Startups and MIT Partners Exhibit

Afternoon Introduction
Peter Bouchard
Program Director, MIT Corporate Relations

Peter Bouchard
Program Director
MIT Corporate Relations

Peter Bouchard joined Corporate Relations in May 2022 as Program Director.

Bouchard comes to Corporate Relations with extensive experience building and managing highly productive relationships in high-growth environments driving sustainable sales, distribution, business development, and strategic alliance revenues and profit. He has been with Eastman Kodak Company since 2009, and in his most recent position there, Bouchard develops strategic partnerships through strong relationships with C-level customers, transforms customers to cloud-based software solutions, and negotiates & manages multi-million-dollar agreements. Before that, he was Business Director-VP of Sales where he led and managed top strategic accounts, leveraging them to grow Eastman Kodak's share of digital equipment, software, consumables, and service revenue. He also held positions as Strategic Account Manager and Director of Marketing during his long career there. Before Eastman Kodak, Bouchard had a long tenure with increasing responsibilities at Presstek Inc. in Hudson NH. He started there as Distribution Manager (one year), then became Director of Worldwide Sales (two years), then General Manager, Digital Printing Business (two years), and finally VP, Marketing & International Business Development (three years).

Bouchard earned his B.S., Chemical Engineering at the University of Maine, Orono, and his M.B.A. at Babson College.

1:30 PM

Create, Prototype, Deliver: Lincoln Laboratory's Engine for National Security

Asha Rajagopal

Commercial innovation is a key component of U.S. national security strategy, but the specialized needs of national security often make harnessing this innovation difficult. As the Department of Defense's largest Federally Funded Research and Development Center, MIT's Lincoln Laboratory's mission is to close this gap and spark disruptive solutions. This talk will highlight how Lincoln Laboratory 1) works with the DoD to analyze its most pressing problems; 2) develops advanced technology or harnesses commercial capabilities to make new solutions possible; 3) creates prototypes to validate solutions or address urgent needs; and 4) efficiently transitions prototypes to the private sector for commercial development. These four overlapping capabilities are the fundamental building blocks of the Laboratory's innovation engine for national security. We will feature examples of significant technologies that have moved out of the lab and into the military and marketplace for real-world impact.

2:00 PM

Building Rational Robots

Leslie Pack Kaelbling

The classical approach to AI was to design systems that were rational at run-time: they had explicit representations of beliefs, goals, and plans, and ran inference algorithms online to select actions. More recently, relatively unstructured, data-driven end-to-end approaches have achieved great success across a wide range of domains and have begun to seem like a plausible path to general-purpose intelligent robots. However, we are now seeing the limits of pure behavior learning, and many practitioners are reintegrating forms of search and explicit reasoning into their approaches.

Leslie Kaelbling will revisit the rational-agent approach to designing intelligent robots from the perspectives of engineering effort, computational efficiency, cognitive modeling, and interpretability. She will present current research aimed at understanding the role of learning in runtime-rational agents, with the ultimate goal of constructing general-purpose, human-level intelligent robots.

2:30 PM

Panel Discussion: Scarcity and Geopolitics

David Rotman

Yasheng Huang

Richard Roth

Gina Aquilano

Tomás Villalon

Rapid and unpredictable shifts in geopolitics, especially those affecting supply, are changing how we invent and innovate. It is critical in making decisions about tomorrow's technologies that we understand these changes, including how they are making many key resources scarce. The panel will explore some of the most important geopolitical trends underway today and how they are affecting innovation, manufacturing, supply chains, and corporate strategy. The panel's experts will discuss if and how companies can survive and thrive in a time of geopolitical uncertainties and the scarcities in resources that often come with those uncertainties.

3:20 PM

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.

3:30 PM

Networking Break

4:00 PM

From Idea to Impact: The Role of University Technology Transfer Offices

Lesley Millar-Nicholson

Reflecting on the MIT’s TLO activities and engagement over the past years, the Executive Director will provide insights and anecdotes about how technology transfer offices, supporting some of the world’s great research institutions, actually work. The high points and low points, the successes and stressors, the fiction and the reality. You will walk away we hope with some useful facts and information to help understand the role of academic institutions in the creation of new ideas/inventions and their practical translation into products/services and new industries.

4:30 PM

What's Next for AI

Amy Nordrum

Artificial intelligence is a core topic of coverage for the newsroom at MIT Technology Review, and the journalists who work there are always looking ahead to what’s coming next. That’s especially challenging for the fast-moving field of artificial intelligence, where it can be particularly difficult to distinguish hype from reality. Executive editor Amy Nordrum will share the major developments and recent advances that the newsroom is watching closely, touching on topics like generative search, AI agents, AI in gaming, small language models, AI companions, and more. Consider this your primer on which areas of AI are most important to know about and worth watching in the months ahead.

5:00 PM

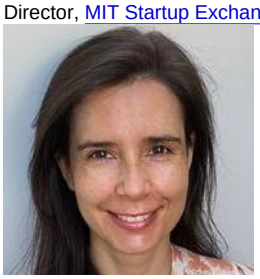
Networking Reception

## Day Two | Track 1 | Entrepreneurship in Action: From Discovery to Disruption (Salon 1-3)

8:30 AM Registration with Light Breakfast

Explore how groundbreaking science and technology translate into market-ready solutions and drive corporate growth. Learn to identify and capitalize on emerging opportunities, understand pathways to commercialization and innovation strategies, and see how your company can benefit from university-industry partnerships through real-world examples. Walk away with actionable insights to drive progress and growth within your organization.

Introduction
Catarina Madeira
Director, MIT Startup Exchange



Catarina Madeira
Director
MIT Startup Exchange

Catarina has been working with the Cambridge/Boston startup ecosystem for over 10 years and joined Corporate Relations with a solid network in the innovation and entrepreneurial community. Prior to MIT, she was part of the team that designed and launched the startup accelerator IUL MIT Portugal, which was later rebranded as Building Global Innovators. She was based in Lisbon and worked in direct relation with the Cambridge team. She held positions including Operations Coordinator, Program Manager, and Business Developer. The accelerator soon achieved steady growth in large part due to the partnerships that Catarina led with regional and global startup ecosystems. After that, she worked at NECEC, leading a program that connects cleantech startups and industry. In this role, she developed and built a pipeline of startups and forged strong relationships with both domestic and European companies. She has also held positions in Portugal and France, including at Saboaria e Perfumaria Confiança and L'Oréal as Technical Director and Pharmacist. Catarina earned her bachelor's in chemistry and pharmaceutical sciences in Portugal. She went on to earn her Master of Engineering for Health and Medicines in France.

9:00 AM AI-Driven Enterprises: The New Arithmetic of Exponential Growth

Paul Cheek

This session unveils the rise of artificial-intelligence-driven enterprises (AIDEs) that fuse the global ambition of innovation-driven startups with the lean efficiency of SMEs. We'll examine how founders wield generative AI across R&D, go-to-market, and operations to slash innovation debt, reach $100M+ ARR with <50 people, and open pathways for regions with limited venture capital to compete globally. Attendees will leave with a framework for building, funding, and scaling their own AIDE internal ventures—and insights into what this shift means for talent, policy, and the future of corporate R&D.

9:35 AM Investing in Deep Tech

Michael Kearney

From Innovation to Impact: Entrepreneurship in 2025. Michael Kearney, General Partner of Engine Ventures, will discuss progress in the MIT innovation ecosystem since the inception of the Engine system in 2017, how the innovative landscape has evolved during that time, and how entrepreneurs and investors are managing through today's economic uncertainties.

10:10 AM | From Prototype to Product: The Power of Research-Industry Partnerships

Ariel Furst

Kei Honda

How can cutting-edge university research make its way into real-world applications? What does it take to build partnerships that go beyond traditional industry-academic relationships? In this fireside chat, MIT's Furst Lab and Idemitsu, a leading global company and ILP member, share insights from their ongoing collaboration, as well as broader principles that apply across sectors. This session offers a candid look at how structured partnerships can accelerate technology translation, de-risk innovation, and create meaningful pathways from lab to market. Learn how forward-thinking collaborations can lay the foundation for new ventures co-developed with industry partners.

10:45 AM | Networking Break

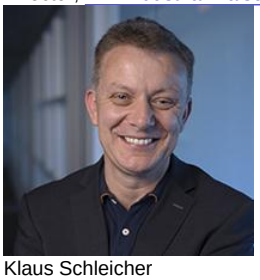
# Day Two | Track 2 | Power Hungry World – The Future of Sustainable Energy (Salon 4)

8:30 AM | Registration with Light Breakfast

Global electricity demand is projected to nearly double by 2050, driven by the rapid electrification of buildings, transportation, and manufacturing. Compounding this pressure is the exponential growth of AI. While AI offers transformative potential across industries, it is also emerging as a significant energy consumer. Data centers, the digital engines powering AI, have more than doubled their electricity consumption since 2018 and now account for 4.4% of global demand. In the U.S., they are expected to consume up to 12% of total electricity by 2028.

This track will explore how the world can meet rising energy needs through the rapid expansion of sustainable energy production. From fusion and next-generation nuclear to renewables, grid-scale storage, decentralized systems, and forward-looking policies, we will examine the innovations and frameworks critical to building a resilient, low-carbon energy future. Addressing this challenge will require a bold vision, accelerated technological advancement, and unprecedented global collaboration.

Introduction
Klaus Schleicher
Director, MIT Industrial Liaison Program



Klaus Schleicher
Director
MIT Industrial Liaison Program

Klaus Schleicher joined the Office of Corporate Relations in 2013. He has a Global Operations and Technology background that has delivered rapid profitable growth in the imaging systems, speech recognition, IT security and consulting, digital printing & media industries. He has executive experience in Sales, Marketing, Product Development, Strategy and Business Development and has held senior positions at Universal Wilde, Presstek Inc., Consul Risk Management B.V. (IBM), Lernout & Hauspie (Nuance), Agfa (Bayer Corp.) and Honeywell Inc. He holds a Master Degree in Computer Science and Engineering, from the Technical University of Giessen in Germany.

View full bio

9:00 AM

Nuclear Reactors Replacing Gas Turbines

Charles Forsberg

Building on Principal Research Scientist Charles Forsberg's research in advanced reactors and high-temperature energy systems, this talk highlights base-load nuclear reactors replacing the gas turbine to provide dispatchable electricity and heat to industry. There are two strategies. The first strategy stores heat from the reactor when low demand for dispatchable heat to industry or dispatchable electricity. Heat storage may exceed 200 hours. The second strategy converts low-price electricity into high-temperature (1700 °C) heat stored in firebrick. Air flows through the firebrick to provide hot air to industry or thermodynamic topping cycles for nuclear reactors, so that peak power is more than twice the base-load electricity output. Both options are enabled by recent inventions and developments.

9:35 AM

Pathways to a Sustainable Energy Future

Sergey Paltsev

Sergey Paltsev will explore the future of sustainable energy in a "power-hungry" world, focusing on the interplay between global energy systems, economic forces, and climate policy. Drawing on integrated global economic modeling, his talk will examine pathways for decarbonization, technology deployment, and policy interventions that can balance energy demand, environmental constraints, and economic growth. Attendees will gain insights into how strategic decisions at the intersection of technology, policy, and economics can shape a sustainable energy future.

10:10 AM

Fusion

Dennis Whyte

In this dynamic talk, Prof. Dennis Whyte, MIT Plasma Science and Fusion Center, presents a compelling vision for fusion energy as the transformative solution to global energy and climate challenges. He explains how fusion—mimicking the power of stars—offers a carbon-free, virtually limitless, and safe energy source that can scale globally. Prof. Whyte highlights recent breakthroughs at MIT, including the development of high-temperature superconducting magnets that drastically reduce the size and cost of fusion reactors. These innovations have led to the creation of SPARC, a compact fusion experiment, and the spinout of Commonwealth Fusion Systems, aimed at commercializing fusion by the early 2030s. Emphasizing fusion's potential to decarbonize not just electricity, but also heavy industry and fuel production, Whyte outlines a clear, science-driven pathway to realizing practical, scalable fusion power within this decade.

10:45 AM

Networking Break

## Day Two | Track 3 | Innovation and Impact in the New Space Era (Salon 5-7)

8:30 AM

Registration with Light Breakfast

This session explores the transformative dynamics of the New Space era, where commercial innovation, rapid development cycles, and expanded access to space are redefining what's possible. Presenters will highlight emerging technologies, novel mission approaches, and cross-sector collaborations driving this shift. Topics may include advances in Earth observation and sensing, the proliferation of small satellite platforms, and research in space physiology to support human spaceflight. Whether technological, scientific, or entrepreneurial, these developments exemplify how New Space is reshaping the space ecosystem and opening new frontiers for exploration, application, and impact.

Introduction

David Martin

9:00 AM

Growth of the New Space Economy and Space Situational Awareness (SSA)

Olivier de Weck

The new space economy is currently experiencing a rapid expansion, with a compound annual growth rate estimated between 7% and 11%. This significant growth encompasses an increasing number of launches, with projections indicating daily launches to space by 2027, as well as a substantial rise in the number of operational satellites. This presentation will provide an overview of the new space economy and elaborate on its co-existence with the traditional government-driven space enterprise. One of the direct consequences of this growth is an increase in the resident space object (RSO) population, underscoring the critical need for enhanced and improved Space Situational Awareness. We will demonstrate how the integration of ground-based radar and optical observations with on-orbit optical sensing can lead to more effective decision-making for collision avoidance maneuvers and other crucial operational considerations.

9:35 AM

Quantifying Atmospheric Methane Emissions with Satellite Observations

Daniel Varon

Methane is a potent greenhouse gas emitted from a wide range of human activities including oil and gas production, coal mining, waste management, and agriculture. Satellites have unique capabilities to quantify and attribute methane emissions worldwide. In this talk, I will discuss recent advances in satellite remote sensing of methane emissions, including targeted observation of individual point sources, global mapping of large emitters with land-imaging satellites, real-time tracking of extreme releases from geostationary orbit, and continuous monitoring of total regional emissions from oil and gas fields.

10:10 AM

The Cloud Above the Clouds: AI and Edge Computing in Space

Kerri Cahoy

Growing satellite constellations in Low Earth Orbit are taking advantage of the lower cost of launch and commercial electronics and components. They leverage intersatellite connectivity and increased onboard compute capability to improve communications and Earth observations. We discuss overcoming the challenges of the space environment and enabling technologies for the future, such as laser communications, dynamic tasking algorithms, direct to cellular, and in-space robotic assembly.

10:45 AM

Networking Break

# Day Two | Track 4 | AI Unleashed: Scaling and Securing Autonomous Intelligence (Salon 1-3)

The next wave of innovation is being shaped by AI systems that don’t just respond; they act. From agentic AI that collaborates and makes decisions autonomously to decentralized architectures that push intelligence to the edge, MIT researchers are leading the charge. They are reimagining how organizations secure, interpret, and operationalize data.

This track brings together thought leaders from across MIT to explore the strategic, organizational, and human implications of AI at scale. Topics will include quantum-safe infrastructure, explainable AI, cyber-physical resilience, agent-based platforms, and the role of trust, transparency, and ethics in intelligent systems.

For enterprises navigating an era defined by autonomy, agility, and risk, this track connects frontier research with real-world impact.

Introduction
Jim Flynn
Program Director, MIT Industrial Liaison Program

Jim Flynn
Program Director
MIT Industrial Liaison Program

Before MIT, Jim was the assistant dean of research business development at the UMass Amherst College of Information and Computer Sciences. Jim founded, built, and sold multiple technology companies in fintech and online media. He has bootstrapped startups and closed venture capital, angel, and private equity funding rounds. Jim also served as the Chief Operating Officer of a public company and a subsidiary of Pitney Bowes. He began his career at AT&T as a software developer, hardware engineer, and national account manager. Jim has authored patents and wrote one of the first books on Java programming. Out of all the roles he's held, Jim's favorite job title by far is dedicated dad of four. He earned a BS from Manhattan College and an MBA with concentrations in finance and international business from New York University.

11:15 AM

Who will keep the Agentic Web Open and Neutral? The NANDA architecture at MIT

Pradyumna Chari
Postdoc in the Media Lab

The Agentic Web holds transformative promise for the democratization of AI, serve as antidote to AGI and unlock trillions of dollars of economic benefits. But it faces threats of fragmentation and centralization as the Internet of AI Agents evolves. Universal interoperability, permissionless innovation, and user sovereignty over data and agents will require transparent protocols and rapid advances to reconcile the needs of a diverse field.

Networked AI Agents in Decentralized Architecture (NANDA) at MIT offers a three-phase roadmap for this emerging landscape. Phase 1 establishes foundation elements—secure agent identity, discovery indices, and interoperability—via open protocols designed to support trust and accountable governance. Phase 2 introduces economic structures such as knowledge pricing, decentralized marketplaces, and reputation-based transactions, enabling agents to coordinate and exchange value at scale. Phase 3 aims for the emergence of agent societies, fostering large-scale co-learning, adaptive population models, and collaborative networks to tackle complex real-world tasks.

This framework is informed by academic work from the Raskar Lab, including algorithmic advances in Automated Machine Learning (AutoML) tailored for distributed health data, split learning for privacy-preserving model training, formal methods for dynamic knowledge valuation, and techniques for co-learning and collaborator selection in decentralized settings. Ensuring the agentic web remains open, safe, and transparent, NANDA's development builds upon open standards, participatory governance, and research-driven safeguards.

11:50 AM

AI Agents: From Fundamental Research to Practical Applications

Dan Gutfreund

Generative programming is a paradigm that takes decades of theoretical research and practical experience in algorithms and software engineering and applies it to the way we interact with LLMs. Instead of developing prompts by trial and error, which usually results in long and complex prompts, generative programs combine known and well-tested control flows and design patterns, such as divide and conquer, with short, consumable prompts. I will describe Mellea, an open-source library for writing generative programs, replacing brittle prompts with structured, maintainable, robust, and efficient AI workflows. I will then discuss some challenges and proposed solutions for efficiently handling multiple models and LLMs' internal memory management within a generative program.

12:25 PM

Panel: The Accountable Enterprise: Governing AI in an Autonomous Age
Jim Flynn
Program Director, MIT Industrial Liaison Program

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Program Director
MIT Industrial Liaison Program

Before MIT, Jim was the assistant dean of research business development at the UMass Amherst College of Information and Computer Sciences. Jim founded, built, and sold multiple technology companies in fintech and online media. He has bootstrapped startups and closed venture capital, angel, and private equity funding rounds. Jim also served as the Chief Operating Officer of a public company and a subsidiary of Pitney Bowes. He began his career at AT&T as a software developer, hardware engineer, and national account manager. Jim has authored patents and wrote one of the first books on Java programming. Out of all the roles he's held, Jim's favorite job title by far is dedicated dad of four. He earned a BS from Manhattan College and an MBA with concentrations in finance and international business from New York University.

Dan Gutfreund

Jaap de Vries

Pradyumna Chari
Postdoc in the Media Lab

Cyrus Shoaul
CEO, Leela.AI

As AI becomes increasingly autonomous and decentralized, global enterprises must rethink how intelligence is built, governed, and scaled. This closing discussion brings together corporate, academic, research, and entrepreneurial perspectives to explore practical strategies for integrating agentic and distributed AI systems across complex organizations. Attendees will gain insight into how leading thinkers are addressing questions of trust, transparency, and control, balancing innovation with accountability to create resilient, adaptive, and competitive enterprises in a future defined by intelligent autonomy.

1:00 PM

Adjournment with Bagged Lunch

# Day Two | Track 5 | Frontiers in Advanced Materials: From Molecular Design to Functional Systems (Salon 5-7)

The future of materials science lies in the seamless integration of molecular precision, functional performance, and nanoscale understanding. This session brings together leading MIT researchers whose work spans the full spectrum of advanced materials innovation—from the bottom-up design of molecular architectures to the real-world deployment of materials and the tools that reveal their behavior at the atomic scale.

Introduction
Peter Lohse
Program Director, MIT Corporate Relations

Peter Lohse
Program Director, MIT Corporate Relations

Dr. Peter Lohse joined the Office of Corporate Relations (OCR) in October 2018 as Program Director.

Lohse comes to OCR with deep and broad knowledge and expertise in the pharma, biotech, and other life sciences-driven industries including agro, nutrition, chemical, and consumer products. As a scientist and entrepreneur, he has an extensive background developing business and managing partnerships with large corporations, early-stage companies, academia, and non-profit organizations. Most recently, Lohse was V.P, Operations and Business Development for InnovaTID Pharmaceuticals in Cambridge. Before that, he was a Strategy Consultant for Eutropics Pharmaceuticals, an emerging biotech company in Cambridge.

Prior to this, Dr. Lohse was Director, Scientific Operations & Innovation Program Director for Eli-Lilly's open innovation platform, InnoCentive, Inc. in Waltham. Earlier in his career, he held positions with increasing responsibility at ArQule of Woburn, Phylos in Lexington, and Novartis Pharma in Switzerland.

Lohse earned his M.S., Chemistry & Applied Sciences and his Ph.D., Organic Chemistry at Federal institute of Technology (ETH) in Switzerland. He earned his M.B.A., Strategy, Finance, Marketing as a Sloan Fellow at MIT. He also held the position Research Fellow, Molecular Biology at Harvard Medical School - Massachusetts General Hospital, Boston (with Professor J. Szostak, Nobel Prize 2009), This was a Swiss National Science Foundation Postdoctoral Fellowship -- In vitro selection of functional RNAs.

View full bio

11:15 AM

From Nano to Macro - Thinking Bigger with Nanoscale Self-Assembly

Robert Macfarlane

A fundamental tenet underlying all materials science is that "structure dictates properties"--thus, better control over material structure enables finer control of material performance. Most materials achieve this control via "top-down" approaches like lithography, molding, or casting, where an external force dictates material form. Such approaches are versatile but often exhibit an intrinsic trade-off between structural complexity and the time and cost of fabrication. Our lab aims to build materials from the bottom up by designing nanoscale building blocks that are pre-programmed to spontaneously organize into complex structures, circumventing the limitations of conventional fabrication approaches. Here we will provide examples of materials with novel optical, chemical, and mechanical properties that are enabled by self-assembly's ability to control material structure across the nano- to macroscopic size regimes.

11:50 AM

Visualizing the Atomic-Level Motions That Underpin Materials Processing and Function

Frances Ross

Modern-day transmission electron microscopes show us the position and nature of the individual atoms within a material. But better still, we can record movies that show how atoms are rearranged during chemical reactions. This is especially relevant to energy-related materials, where energy storage is often accompanied by changes in atomic configuration; in microelectronics, where processing must create precisely defined nanostructures; in structural materials such as cement during hydration, and in quantum materials, where the details of atomic structure determine how well a qubit will work. Through these and other examples, I will show how time-resolved electron microscopy helps us develop new materials and optimize the performance of materials we already know.

12:25 PM Design of New Alloys with Exceptional Damage Resistance

Cem Tasan

Metal design is key in solving engineering problems across numerous sectors that rely on material performance. Our group develops novel methods to observe metal microstructures at work. Based on these unique insights, we identify new design concepts for steels, titanium alloys, high entropy alloys, and beyond. In this talk, several case studies will be presented to demonstrate the strength of this approach in solving various industrial problems.

1:00 PM Adjournment with Bagged Lunch

# Day Two | Track 6 | Engineering Life Sciences: Interdisciplinary Pathways from Concept to Impact (Salon 4)

Life sciences are no longer confined to the realm of biology—they have evolved into a multidisciplinary frontier. This session examines the dynamic intersection of biology, engineering, and computational science, where bold ideas give rise to transformative innovation. By integrating AI, advanced technologies, and foundational biological research, the session will highlight how cross-disciplinary collaboration accelerates the path from scientific discovery to real-world application at MIT. Emphasizing the translation of visionary research into impactful solutions, this track invites participants to reimagine what becomes possible when disciplines converge to shape the future.

Introduction
Natalie Kim

Program Director, MIT Corporate Relations

Natalie Kim

Program Director, MIT Corporate Relations

Dr. Najung “Natalie” Kim is a Program Director at the MIT Industrial Liaison Program. She brings to the Office of Corporate Relations (OCR) expertise in strategic collaboration in life sciences and biotech industries, including cell and gene therapy and AI/ML analytics. Kim comes to OCR from Adjuvant Partners where she has been serving as Senior Consultant, Strategic Partnering, working to connect industry, startups, and academic leaders in the cell and gene therapy sector. Before Adjuvant, Natalie worked at Ajinomoto, where she was Manager of the Research & Innovation Center, facilitating collaborations on preclinical and clinical development of biologics, diagnostics, and cell therapy ancillary products in Asia, Europe, and North America. Prior to Ajinomoto, Kim was a business development manager at Medipost, where she led strategic partnerships in mesenchymal stem cell therapeutics in orthopedic and neurodegenerative applications. Kim also went through her postdoctoral training at the Wake Forest Institute for Regenerative Medicine as a Department of Defense Research Fellow working on translational gene therapy in tissue engineering programs.

Kim earned her B.S. Bioscience and Food Engineering at Handong Global University, her M.S. Medicine at Seoul National University in South Korea, and her Ph.D. Biomedical Engineering at the University of Iowa.

11:15 AM

Targeting Glycans for Cancer Immunotherapy

Jessica Stark

Despite the curative potential of cancer immunotherapy, many patients do not benefit from existing treatments. Glyco-immune checkpoints – interactions of cancer glycans with inhibitory glycan-binding receptors called lectins – have emerged as prominent mechanisms of resistance to molecular and cellular immunotherapies. I will describe the development of antibody-lectin chimeras: a biologic framework for glyco-immune checkpoint blockade that is now moving toward the clinic.

11:50 AM

Convergence of Engineering and Biology to Advance New Biotechnologies

Christopher Love

Engineering principles and biological insights can open up new capabilities for biotechnology. This talk will highlight two solutions to challenges faced in improving patient care. First, applying basic principles in chemical engineering to the limitations in blood-based cancer diagnostics today led to new approaches to enhance the amounts of cell-free DNA recovered using a novel 'enhancing agent' similar to contrast agents used in other diagnostics. Second, leveraging biological insights to recast the engineering operations required to enable small biomanufacturing systems for distributed and lower capital-intensive production.

12:25 PM

Antibody–Bottlebrush Pro-drug Conjugates: A Novel Platform for Targeted Theranostics

Jeremiah Johnson

Antibody–drug conjugates (ADCs) are the gold standard for targeted drug delivery systems, but their chemical design imposes constraints that, if addressed, could enable a new generation of cancer therapeutics and imaging modalities. For example, due to bioconjugation limitations, the payload scope of ADCs is restricted to highly potent payloads with inherently unselective mechanisms of action, leading to narrow therapeutic windows and resistance. This seminar will introduce a new platform called Antibody–Bottlebrush prodrug Conjugates (ABCs) that can potentially address these challenges. ABCs feature a modular design that allows drug-to-antibody ratios (DARs) from ~1–135 while maintaining strong target binding, efficient cellular uptake, and favorable pharmacokinetics and biodistribution. Leveraging their capability to access very high DARs, ABCs can carry payloads (e.g., 10-fold less potent than existing ADC payloads) that are insufficiently potent to be used in traditional ADCs, thereby enabling new mechanisms-of-action. Moreover, ABCs are readily amenable to using various payload combinations, release mechanisms, and non-drug (e.g., imaging) agents. ABCs display efficacies on par with or superior to clinical ADCs in preclinical tumor models at clinically relevant payload doses, motivating their further clinical translation.

1:00 PM

Adjournment with Bagged Lunch

# Day Two | Optional Conference Campus Tours

**On day two, after lunch at 1:15 PM, join the ILP for a unique opportunity to explore MIT through concurrent tours, each providing an in-depth look at the institute's innovation ecosystem. Sign-up boards will be available at the registration desk starting in the morning.**

1:15 PM

Attendees to gather at the ILP registration desk for departure from the Marriott

1:30 PM - 2:30 PM

MIT Campus Walking Tour (15 people max)

Take a guided tour of our dynamic campus and experience firsthand how MIT is making a better world. From cutting edge research to innovation, from world-renowned architecture to rich community life, the MIT campus is a treasure to explore. MIT is also the heart of the vibrant innovation district of Kendall Square, the most innovative square mile in the world – come see how academics, entrepreneurs, corporations and non-profits make it all happen.

1:30 PM - 2:30 PM

MIT Museum (15 people max)

Participants will be introduced to provocative exhibitions on CRISPR and AI, the magical kinetic sculptures of Arthur Ganson and Andy Cavatora, and countless unexpected treasures from the museum collection of more than a million artifacts.

1:30 PM - 2:30 PM

MIT.nano (15 people max)

Set in the heart of campus, MIT.nano is the Institute's 200,000 sf center for nanoscale science and engineering research. Take a behind the scenes tour of key research spaces, hear about the progress MIT.nano has made since its launch in 2018, and learn how this remarkable building is helping researchers from every corner of MIT explore the dawn of the Nano Age.

1:30 PM - 3:00 PM

Innovation Trail: VIP Walking Tour (25 people max)

Join a group of fellow participants for a special walking tour of The Innovation Trail, a walking route that highlights the past, present, and future of science, technology, and innovation in the Boston-Cambridge area. We'll cover everything from NASA to candy-making to Google to MIT's tradition of "hacks" or student pranks. Tour begins in the lobby of the Marriott, lasts 90 minutes, and ends with an easy walk back to the hotel. Wear comfortable shoes and dress for the weather.

# Post-RD ILP Member Exclusive Workshop: Scaling AI for Business Impact

Scaling AI for Business Impact

Building on insights from the 2025 MIT Research and Development Conference, this ILP Member Exclusive Workshop invites you to elevate your leadership and AI strategy skills in a focused, high-impact session on **Thursday, November 20, 2025** at **MIT Industry Meeting Center, E90** (One Main Street, 12th Floor, Cambridge, MA 02142).

Designed specifically for ILP members and led by experts Abel Sanchez and Blade Kotelly, this workshop will help you:

- Gain actionable frameworks to scale AI from pilot projects to enterprise-wide adoption
- Explore real-world case studies of successful large-scale AI implementation
- Learn strategies to align AI initiatives with broader organizational goals

Visit the website for full agenda: ilp.mit.edu/ScalingAI25

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**Interested in attending?** Contact your ILP Program Director, or send email to **ocrevents@mit.edu** for more information about the event.