

MIT Industrial Liaison Program Faculty Knowledgebase Report

Work of the Future @MIT

April 29, 2021 10:00 am - 12:00 pm

10:00 AM

Welcome and Introduction
Kenneth Goldman

Manager, Corporate Relations
MIT Industrial Liaison Program

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Dr. Kenneth A. Goldman joined the MIT Industrial Liaison Program in 1988, managing a diverse portfolio of mostly European memberships, and concentrating in telecommunications and high technology. Before then he worked at Project Athena, MIT's experiment in distributed educational computing, where he organized and managed the visitor and demonstration facility.

Dr. Goldman has special responsibility for relations with the MIT Media Laboratory, the Department of Linguistics and Philosophy, and the Department of Political Science.

Until recently he was manager of the Communications, Information Technology and Financial Services Industry group of Corporate Relations. He speaks fluent Italian, Russian and Serbocroatian, and some French and Spanish. He has studied many other languages. He has travelled extensively throughout both Eastern and Western Europe and lived in Belgrade for several years.

After completing a doctoral degree in Slavic Languages and Literatures, applying information technology to analyze Serbocroatian oral epic, Dr. Goldman worked for several years in the Division of Research at the Harvard Business School, in the Program for Industry and Company Analysis. Following that he worked for Compulex, Inc. of Lowell, MA, which produced multilingual word processing systems, where he was hired as manager of documentation and training, and then assumed responsibility for customer support, product design and product management. He then worked in a number of positions in the software industry before coming to Project Athena.

Jump Starting America
Simon Johnson
Ronald A Kurtz (1954) Professor of Entrepreneurship,
Professor of Global Economics and Management, [MIT Sloan School of Management](#)



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Simon Johnson is the *Ronald A. Kurtz (1954) Professor of Entrepreneurship* at the MIT Sloan School of Management, where he is head of the Global Economics and Management group. In 2007-08 he was chief economist at the International Monetary Fund, and he currently co-chairs the [CFA Institute Systemic Risk Council](#). In February 2021, [Johnson joined the board of directors of Fannie Mae](#).

Johnson's most recent book, with Daron Acemoglu, [Power and Progress: Our 1000-Year Struggle Over Technology and Prosperity](#), explores the history and economics of major technological transformations up to and including the latest developments in Artificial Intelligence.

His previous book, with Jonathan Gruber, [Jump-Starting America: How Breakthrough Science Can Revive Economic Growth and the American Dream](#), explained how to create millions of good new jobs around the U.S. through renewed public investment in research and development. This proposal attracted [bipartisan support](#).

Johnson was previously a senior fellow at the Peterson Institute for International Economics in Washington, D.C., a cofounder of [BaselineScenario.com](#), a member of the Congressional Budget Office's Panel of Economic Advisors, and a member of the Federal Deposit Insurance Corporation's Systemic Resolution Advisory Committee. From July 2014 to early 2017, Johnson was a member of the Financial Research Advisory Committee of the U.S. Treasury's Office of Financial Research (OFR), within which he chaired the Global Vulnerabilities Working Group.

"[The Quiet Coup](#)" received over a million views when it appeared in *The Atlantic* in early 2009. His book [13 Bankers: the Wall Street Takeover and the Next Financial Meltdown](#) (with James Kwak), was an immediate bestseller and has become [one of the mostly highly regarded books on the financial crisis](#). Their follow-up book on U.S. fiscal policy, [White House Burning: The Founding Fathers, Our National Debt, and Why It Matters for You](#), won praise across the political spectrum. Johnson's academic research papers on long-term economic development, corporate finance, political economy, and public health are widely cited.

"For his articulate and outspoken support for public policies to end too-big-to-fail", [Johnson was named a Main Street Hero](#) by the Independent Community Bankers of America (ICBA) in 2013.

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In the decades that followed World War II, the U.S. led the world in innovation, creating entirely new sectors such as jet aircraft, life-saving drugs and vaccines, microelectronics, satellites, and digital computers. Widespread innovation boosted productivity. Household income increased faster than ever before, while inequality declined. Since the 1970s, however, U.S. productivity growth has slowed while the well-paying jobs that we do have in the U.S. are now concentrated disproportionately in a small number of superstar cities. People in the rest of the country increasingly – and correctly – feel that they are being left behind. What went wrong? Policymakers forgot one of the most important lessons of the post-1945 period.

10:20 AM

Changing workforce and economy
Thomas Kochan
George Maverick Bunker Professor of Management
Professor Post Tenure, [MIT Sloan School of Management](#)



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Thomas A. Kochan is the Post-Tenure *George Maverick Bunker Professor* at the MIT Sloan School of Management and a faculty member in the MIT Institute for Work and Employment Research.

Kochan focuses on the need to update America's work and employment policies, institutions, and practices to catch up with a changing workforce and economy. His recent work calls attention to the need for a new social contract at work, one that anticipates and engages current and future technological changes in ways that build a more inclusive economy and broadly shared prosperity. Through empirical research, he demonstrates that fundamental changes in the quality of employee and labor-management relations are needed to address America's critical problems in industries ranging from healthcare to airlines to manufacturing. His most recent book is *Shaping the Future of Work: A Handbook for Action and a New Social Contract* (Routledge, 2021).

He is a member of the National Academy of Human Resources, the National Academy of Arbitrators, and past president of the International Industrial Relations Association and the Industrial Relations Research Association. Currently he is member of the MIT Task Force on Work of the Future.

Kochan holds a BBA in personnel management as well as an MS and a PhD in industrial relations from the University of Wisconsin?.

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This talk reviews the long term growth in income inequality that preceded the events of the past year and then discusses how the COVID crisis along with rising calls for racial justice and gender equity have accelerated the need to address America's deep economic and social divisions. I call for business, labor, education, and government leaders to work together to build a new social contract governing work. The talk serves as a call to action to shape a future of work that works for all Americans.

10:35 AM

Inequality and the Future of Work
Nathan Wilmers
Sarofim Family Career Development Professor
Assistant Professor, Work and Organization Studies
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Nathan Wilmers is the *Sarofim Family Career Development Professor* and an Assistant Professor of Work and Organization Studies at the MIT Sloan School of Management. He is a member of the Institute for Work and Employment Research and affiliated with the Economic Sociology program. For the most up-to-date information on his research, please see his personal website at www.nathanwilmers.com.

Wilmers researches wage and earnings inequality, economic sociology, and the sociology of labor. In his empirical research, he studies how wage stagnation and rising earnings inequality result from weakening labor market institutions, changing market power, and job restructuring. More broadly, he is interested in bringing insights from economic sociology to the study of labor markets and the wage structure. His research has been published in the *American Sociological Review*, the *American Journal of Sociology*, and *Social Forces*.

Wilmers holds a BA in philosophy from the University of Chicago and an MA and PhD in sociology from Harvard University.

Why has upward mobility declined so much in the last 50 years? How can we make an economy that works for everyone? This talk identifies the key sources of pay inequality and addresses the role played by employers.

10:50 AM

The Future of Remote and Hybrid Work: Research Lessons and Post-Pandemic Strategies
Erin Kelly
Sloan Distinguished Professor of Work and Organization Studies
Professor, Work and Organization Studies
Co-Director, MIT Institute for Work and Employment Research



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Erin L. Kelly is the *Sloan Distinguished Professor of Work and Organization Studies* at the MIT Sloan School of Management and Co-Director of the MIT Institute for Work and Employment Research. Erin conducts research in firms and other organizations to identify and evaluate changes in workplace policies and management practices that may improve workers' wellbeing and advance equity while supporting strong organizational performance. Her book *Overload: How Good Jobs Went Bad and What to Do About It* (Princeton University Press, 2020, co-authored with Phyllis Moen) is based on a major experiment in a Fortune 500 firm and received the Max Weber Award from the American Sociological Association in 2021. Erin studies, teaches, and speaks on work redesign and wellbeing, the future of work, and organizational practices to advance diversity, equity, and inclusion. She holds a Ph.D. in sociology from Princeton University.

What comes next for remote work and related work arrangements, after the COVID-19 pandemic drove many white-collar and professional workers home? Erin Kelly identifies key insights and implications from her research and other studies. This talk incorporates lessons from her recent book *Overload: How Good Jobs Went Bad and What We Can Do About It* (2020, Princeton University Press, co-authored with Phyllis Moen) and updates guidance for the period after COVID-19, when remote and hybrid strategies are expected by many but need to be managed well.

11:05 AM

Workforce Education: A New Roadmap

Sanjay Sarma

Vice President for Open Learning

Fred Fort Flowers (1941) and Daniel Fort Flowers (1941) Professor of Mechanical Engineering



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Sanjay Sarma is the Fred Fort Flowers (1941) and Daniel Fort Flowers (1941) Professor of Mechanical Engineering at MIT. He is the first Dean of Digital Learning at MIT. He co-founded the Auto-ID Center at MIT and developed many of the key technologies behind the EPC suite of RFID standards now used worldwide. He was also the founder and CTO of OATSystems, which was acquired by Checkpoint Systems (NYSE: CKP) in 2008. He serves on the boards of GS1, EPCglobal and several startup companies including Senaya and ESSESS.

Dr. Sarma received his Bachelors from the Indian Institute of Technology, his Masters from Carnegie Mellon University and his PhD from the University of California at Berkeley. Sarma also worked at Schlumberger Oilfield Services in Aberdeen, UK, and at the Lawrence Berkeley Laboratories in Berkeley, California. He has authored over 75 academic papers in computational geometry, sensing, RFID, automation and CAD, and is the recipient of numerous awards for teaching and research including the MacVicar Fellowship, the Business Week eBiz Award and Informationweek's Innovators and Influencers Award. He advises several national governments and global companies.

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Even before the pandemic, the rapid pace of technological advances was exposing a gap in America's education system: workforce education. Labor economists have long talked about the ongoing erosion of middle class jobs, and the increases at the high and low ends of the wage spectrum. COVID, meanwhile, has hurt low-wage earners on several fronts including health and employment, and job mobility is becoming challenging. Workforce education is an important tool in addressing these issues, especially after the pandemic. We present describe new modalities that will help transform workforce education including online learning, new learning technologies, and blended in-person classrooms. We also describe policies and institutional initiatives that can help learners before, during and in between employment.

11:20 AM

Workforce Development for Advanced Manufacturing
Lionel Kimerling

Thomas Lord Professor of Materials Science and Engineering
Director, Microphotonics Center
MIT Department of Materials Science and Engineering

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Lionel Kimerling is the Thomas Lord Professor of Materials Science and Engineering at MIT and the Director of the MIT Microphotonics Center. After a PhD at MIT, he served as Captain in the USAF. He was Head, Materials Physics Research at AT&T Bell Laboratories when he joined the faculty of MIT as Professor. He has authored more than 550 technical articles, and he holds more than 75 patents in the fields of integrated photonics and semiconductor processing. At AT&T, he led the corporate-wide Silicon Materials R,D&M Technology Forum. At MIT, Kimerling was Director of the Materials Processing Center for 15 years, establishing it as the industry portal for faculty across all materials-related disciplines. The MIT Microphotonics Center brings together faculty from eight departments in the Schools of Engineering, Science, Business, and Humanities for large industry-sponsored research programs and the Communication Technology Roadmap (CTR). More than 300 industrial, academic, and government organizations have contributed to Roadmap releases, which are now merged under the Integrated Photonics System Roadmap, International (IPSR-I). Kimerling's research teams have enabled long-lived telecommunications lasers; developed semiconductor inspection and root cause diagnostic methods such as DLTS, SEM-EBIC and RF-PCD; and pioneered silicon microphotonics.

Kimerling was President, TMS; Chairman, Editorial Board of the Journal of Electronic Materials; and he has served on the Advisory Board, National Center for Photovoltaics, DOE and the National Materials Advisory Board, NRC. Kimerling is the recipient of the ECS Electronics Division award, the TMS John Bardeen Award, the MIT Perkins Award for Excellence in Graduate Advising, and the Humboldt Senior Scientist Research Award. He is a Fellow of the American Physical Society, AAAS, TMS, MRS and the U Tokyo School of Engineering.

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The 2020-2030 decade presents a significant opportunity to establish leadership in manufacturing semiconductor chips and the associated supply chain elements for subsystems and systems. Communication, computation, imaging and sensing systems are undergoing a major technology transition to distributed architectures that gather and process information and actuate responses. Application performance has scaled with aggregate improvements in "the 3 Ps", performance, power and programming, at a rate of 1000x every 10 years.

Populating the workforce with enthusiastic value generators is the most critical element in the advanced manufacturing supply chain, because manufacturing has been outsourced for two generations of workers. 'Establishing leadership' means harnessing the intellectual fervor, work intensity and commercial innovation baked into the character of the workforce and focusing it on well-defined, strategic goals. This presentation will highlight work products and best practices developed by MIT's Initiative for Knowledge and Innovation in Manufacturing (IKIM) for national, regional and company specific workforce development.

The AIM Academy project at MIT is the headquarters for the education, workforce development and technology roadmap for AIM Photonics Institute, one of the national Advanced Manufacturing Institutes. It is one of the most active programs within IKIM. Integrated Photonics is a transformative manufacturing technology, but the path to adoption and diffusion into the supply chain is fragmented. Three skill development areas consistently appear as a primary concern: technician-level test and data analysis, engineer-level design into standard foundry processes, and teaming to achieve system optimization. A hierarchy of delivery modes are required to effectively reach K-12 through industry executives; and the IKIM portfolio features TED-Ed videos, on-line courses, in-person academies, bootcamps, and prototyping labs.

11:35 AM

MIT Startup Exchange Lightning Talk

[iQ3Connect](#): Enabling remote collaboration beyond the flat screen

Ali Merchant
Co-founder and CEO
[iQ3Connect](#)

MIT Startup Exchange Lightning Talk

[Coding Dojo](#): Transforming lives through programming literacy

Richard Wang
CEO
[Coding Dojo](#)

MIT Startup Exchange Lightning Talk

[SplitSage](#): Increase Effectiveness. Improve Safety. Enhance Performance

Joshua Sarmir
CEO
[SplitSage](#)