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Mission directors announced for the Climate Project at MIT

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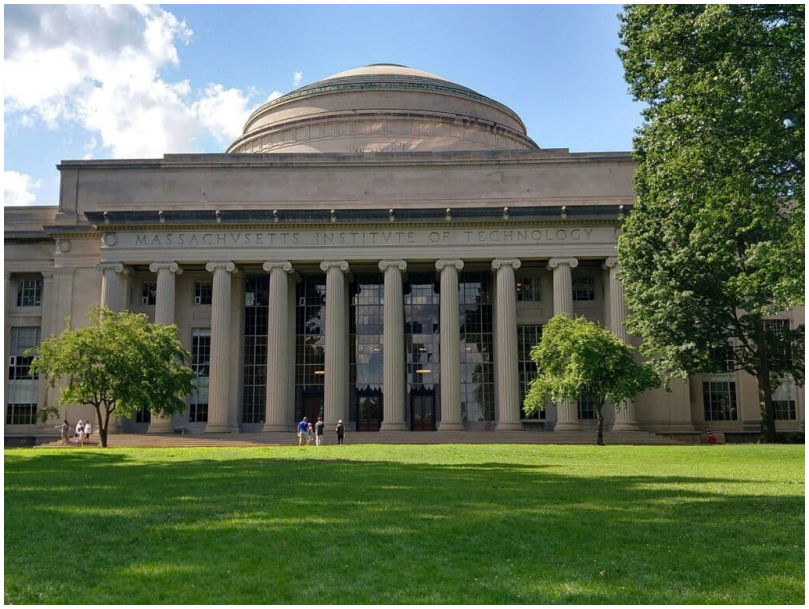

The Climate Project at MIT has appointed leaders for each of its six focal areas, or Climate Missions, President Sally Kornbluth announced in a letter to the MIT community this week.

Introduced in February, the Climate Project at MIT is a major new effort to change the trajectory of global climate outcomes for the better over the next decade. The project will focus MIT's strengths on six broad climate-related areas where progress is urgently needed. The mission directors in these fields, representing diverse areas of expertise, will collaborate with faculty and researchers across MIT, as well as each other, to accelerate solutions that address climate change.

"The mission directors will be absolutely central as the Climate Project seeks to marshal the Institute's talent and resources to research, develop, deploy and scale up serious solutions to help change the planet's climate trajectory," Kornbluth wrote in her letter, adding: "To the faculty members taking on these pivotal roles: We could not be more grateful for your skill and commitment, or more enthusiastic about what you can help us all achieve, together."

The Climate Project will expand and accelerate MIT's efforts to both reduce greenhouse gas emissions and respond to climate effects such as extreme heat, rising sea levels, and reduced crop yields. At the urgent pace needed, the project will help the Institute create new external collaborations and deepen existing ones to develop and scale climate solutions.

The Institute has pledged an initial $75 million to the project, including $25 million from the MIT Sloan School of Management to launch a complementary effort, the new MIT Climate Policy Center. MIT has more than 300 faculty and senior researchers already working on climate issues, in collaboration with their

students and staff. The Climate Project at MIT builds on their work and the Institute's 2021 "Fast Forward" climate action plan.

Richard Lester, MIT's vice provost for international activities andthe Japan Steel Industry Professor of Nuclear Science and Engineering, has led the Climate Project's formation; MIT will shortly hire a vice president for climate to oversee the project. The six Climate Missions and the new mission directors are as follows:

Decarbonizing energy and industry

This mission supports advances in the electric power grid as well as the transition across all industry — including transportation, computing, heavy production, and manufacturing — to low-emissions pathways.

The mission director is Elsa Olivetti PhD '07, who is MIT's associate dean of engineering, the Jerry McAfee Professor in Engineering, and a professor of materials science and engineering since 2014.

Olivetti analyzes and improves the environmental sustainability of materials throughout the life cycle and across the supply chain, by linking physical and chemical processes to systems impact. She researches materials design and synthesis using natural language processing, builds models of material supply and technology demand, and assesses the potential for recovering value from industrial waste through experimental approaches. Olivetti has experience building partnerships across the Institute and working with industry to implement large-scale climate solutions through her role as co-director of the MIT Climate and Sustainability Consortium (MCSC) and as faculty lead for PAIA, an industry consortium on the carbon footprinting of computing.

Restoring the atmosphere, protecting the land and oceans

This mission is centered on removing or storing greenhouse gases that have already been emitted into the atmosphere, such as carbon dioxide and methane, and on protecting ocean and land ecosystems, including food and water systems.

MIT has chosen two mission directors: Andrew Babbin and Jesse Kroll. The two bring together research expertise from two critical domains of the Earth system, oceans and the atmosphere, as well as backgrounds in both the science and engineering underlying our understanding of Earth's climate. As co-directors, they jointly link MIT's School of Science and School of Engineering in this domain.

Babbin is the Cecil and Ida Green Career Development Professor in MIT's Program in Atmospheres, Oceans, and Climate. He is a marine biogeochemist whose specialty is studying the carbon and nitrogen cycle of the oceans, work that is related to evaluating the ocean's capacity for carbon storage, an essential element of this mission's work. He has been at MIT since 2017.

Kroll is the Peter de Florez Professor in MIT's Department of of Civil and Environmental Engineering, a professor of chemical engineering, and the director of the Ralph M. Parsons Laboratory. He is a chemist who studies organic compounds and particulate matter in the atmosphere, in order to better understand how perturbations to the atmosphere, both intentional and unintentional, can affect air pollution and

climate.

Empowering frontline communities

This mission focuses on the development of new climate solutions in support of the world's most vulnerable populations, in areas ranging from health effects to food security, emergency planning, and risk forecasting.

The mission director is Miho Mazereeuw, an associate professor of architecture and urbanism in MIT's Department of Architecture in the School of Architecture and Planning, and director of MIT's Urban Risk Lab. Mazereeuw researches disaster resilience, climate change, and coastal strategies. Her lab has engaged in design projects ranging from physical objects to software, while exploring methods of engaging communities and governments in preparedness efforts, skills she brings to bear on building strong collaborations with a broad range of stakeholders.

Mazereeuw is also co-lead of one of the five projects selected in MIT's Climate Grand Challenges competition in 2022, an effort to help communities prepare by understanding the risk of extreme weather events for specific locations.

Building and adapting healthy, resilient cities

A majority of the world's population lives in cities, so urban design and planning is a crucial part of climate work, involving transportation, infrastructure, finance, government, and more.

Christoph Reinhart, the Alan and Terri Spoon Professor of Architecture and Climate and director of MIT's Building Technology Program in the School of Architecture and Planning, is the mission director in this area. The Sustainable Design Lab that Reinhart founded when he joined MIT in 2012 has launched several technology startups, including Mapdwell Solar System, now part of Palmetto Clean Technology, as well as Solemma, makers of an environmental building design software used in architectural practice and education worldwide. Reinhart's online course on Sustainable Building Design has an enrollment of over 55,000 individuals and forms part of MIT's XSeries Program in Future Energy Systems.

Inventing new policy approaches

Climate change is a unique crisis. With that in mind, this mission aims to develop new institutional structures and incentives — in carbon markets, finance, trade policy, and more — along with decision support tools and systems for scaling up climate efforts.

Christopher Knittel brings extensive knowledge of these topics to the mission director role. The George P. Shultz Professor and Professor of Applied Economics at the MIT Sloan School of Management, Knittel has produced high-impact research in multiple areas; his studies on emissions and the automobile industry have evaluated fuel-efficiency standards, changes in vehicle fuel efficiency, market responses to fuel-price changes, and the health impact of automobiles.

Beyond that, Knittel has also studied the impact of the energy transition on jobs, conducted high-level

evaluations of climate policies, and examined energy market structures. He joined the MIT faculty in 2011. He also serves as the director of the MIT Climate Policy Center, which will work closely with all six missions.

Wild cards

This mission consists of what the Climate Project at MIT calls “unconventional solutions outside the scope of the other missions,” and will have a broad portfolio for innovation.

While all the missions will be charged with encouraging unorthodox approaches within their domains, this mission will seek out unconventional solutions outside the scope of the others, and has a broad mandate for promoting them.

The mission director in this case is Benedetto Marelli, the Associate Professor in MIT’s Department of Civil and Environmental Engineering. Marelli’s research group develops biopolymers and bioinspired materials with reduced environmental impact compared to traditional technologies. He engages with research at multiple scales, including nanofabrication, and the research group has conducted extensive work on food security and safety while exploring new techniques to reduce waste through enhanced food preservation and to precisely deliver agrochemicals in plants and in soil.

As Lester and other MIT leaders have noted, the Climate Project at MIT is still being shaped, and will have the flexibility to accommodate a wide range of projects, partnerships, and approaches needed for thoughtful, fast-moving change. By filling out the leadership structure, today’s announcement is a major milestone in making the project operational.

In addition to the six Climate Missions, the Climate Project at MIT includes Climate Frontier Projects, which are efforts launched by these missions, and a Climate HQ, which will support fundamental research, education, and outreach, as well as new resources to connect research to the practical work of climate response.