

## Office of the Vice President for Research

In the face of ongoing challenges created by the COVID-19 pandemic, the [Office of the Vice President for Research \(OVPR\)](#) was able to continue to effectively meet the needs of MIT's research community during fiscal year 2021. Research Administration Services (RAS), an OVPR unit, successfully submitted more than 3,200 research proposals during FY2021, even with staff members teleworking. The OVPR appointed new senior leaders in key areas and led the development of a comprehensive new climate action plan for MIT.

Despite COVID restrictions on campus access, laboratories and centers reporting to the OVPR continued to perform leading-edge research that addresses some of the world's most pressing challenges, ranging from climate change to cancer treatment. Across OVPR units, faculty and staff found new ways to complete their work and deliver services despite the extensive challenges posed by the pandemic; as one example, Postdoctoral Services held its annual resource fair for postdoctoral scholars virtually in September 2020.

This report highlights other key developments and accomplishments within OVPR units during an unusual and oftentimes difficult year.

### Organizational Changes within the OVPR

The OVPR announced organizational changes in FY2021 to strengthen service delivery and coordination with other MIT offices, particularly the Office of Strategic Alliances and Technology Transfer (OSATT). In April 2021, Professor Krystyn Van Vliet agreed to serve as associate vice president for research, a new role, in addition to overseeing OSATT in her role as associate provost. Within the OVPR, Van Vliet oversees RAS, Research Development, Research Facilities, and related areas. See the RAS and OSATT reports for details on their leadership and structure.

To meet increasingly complex research compliance needs, the OVPR appointed Gregory Moffatt as MIT's first chief research compliance officer in September 2020. Moffatt coordinates the development and implementation of export control and research compliance programs across MIT, collaborating closely with the Office of General Counsel to interpret federal policies and regulations and monitor the compliance landscape.

The OVPR also began a search for a director of diversity, equity, and inclusion, a new role to work with senior administrators to develop and implement programs and activities to strengthen diversity, equity, and inclusion in OVPR areas.

### Ramp-Up of In-Person Research

Following COVID-related restrictions to campus access that began in March 2020, a key OVPR focus in FY2021 was to resume as much in-person research as possible while protecting the health and safety of MIT community members. This "research ramp-up" effort, led by two faculty and staff committees (known as the Thunder Committee and the Lightning Committee), proceeded in phases throughout the year based on public health conditions and guidance. By the end of FY2021, the committees were able to lift

most restrictions, including capacity limits. They continue to monitor the public health situation closely.

## Research Volume

In FY2021 MIT's campus research volume decreased 2.9% to \$740 million, from \$762 million in FY2020, reflecting modest declines in both federally funded and non-federally funded research. Federal funding constituted 61.5% of campus research expenditures, while industry and foundations continued to provide substantial support (totaling 33.4%). Please see the RAS report for more details.

## Expanded Efforts to Address Global Climate Change

In May 2021, MIT issued its second climate action plan—Fast Forward: MIT's Climate Action Plan for the Decade—building on the progress achieved under the Institute's 2015 plan. Fast Forward outlines five broad areas in which MIT will expand and accelerate its efforts to help address the growing climate crisis: sparking innovation; educating future generations; informing policy; reducing MIT's own climate impact; and uniting and coordinating MIT's climate efforts.

In July 2020, MIT launched Climate Grand Challenges, an effort that aims to mobilize the MIT research community around challenging unsolved problems in adaptation, carbon removal, climate science, climate policy, human impacts, and greenhouse gas emissions reductions. By the November 2020 deadline, 97 teams had submitted letters of interest; in March 2021, 28 of these teams were invited to submit white papers further developing their ideas. In January 2021, MIT additionally announced the Climate and Sustainability Consortium, which convenes leading companies from a broad range of industries with the aim of vastly accelerating large-scale, real-world implementation of solutions to address the threat of climate change.

## International Scholars

As a result of COVID-19, both the number of international scholars present at the Institute and the number of new scholars who were able to arrive decreased dramatically during FY2021. Nevertheless, despite the unprecedented challenges posed by the pandemic, including frequently changing national travel restrictions and policies, in FY2021 the International Scholars Office served 1,866 international scholars affiliated with MIT and their accompanying family members, working closely with administrators in the 67 departments, laboratories, centers, and programs that hosted international scholars.

## Research and Related Highlights

Below are select highlights from the laboratories, centers, and initiatives reporting to the OVPR. Please consult the organizations' individual reports to learn more about their accomplishments in FY2021.

- Center for Environmental Health Sciences (CEHS): The chemical N-nitrosodimethylamine (NDMA), a suspected carcinogen, is being found with increasing frequency in waters, foods, tobacco products, and as byproducts of the manufacture of some pharmaceutical products. Traditionally, NDMA

is measured using a laborious process requiring sophisticated and expensive instrumentation. Researchers at CEHS collaborated to develop the first carbon nanotube sensors for detecting NDMA in air. These sensors eliminate the tedious and costly procedures associated with traditional analysis and provide inexpensive, real-time, and sensitive measurement of NDMA in air.

- **Environmental Solutions Initiative (ESI):** In a virtual forum led by ESI, representatives from the Wyoming Governor’s Office, the University of Wyoming School of Energy Resources, and Wyoming Energy Authority met with MIT faculty and researchers to discuss avenues for strengthening the state’s energy economy while lowering its carbon emissions. Specific topics included carbon capture technology, hydrogen, and renewable energy; using coal for materials and advanced manufacturing; and how communities can adapt and thrive in a changing energy marketplace.
- **Haystack Observatory: MOXIE (Mars Oxygen In-situ Resource Utilization Experiment),** an instrument on NASA’s Perseverance rover, successfully demonstrated a solid oxide electrolysis technology for converting the Martian atmosphere to oxygen. MOXIE is a joint venture between Haystack, MIT’s Department of Aeronautics and Astronautics, NASA, and NASA’s Jet Propulsion Laboratory (managed by Caltech).
- **MIT Energy Initiative:** Substantial progress has been made in developing energy system analysis and optimization tools. The Sustainable Energy System Analysis Modeling Environment will be deployed as an open-source web application for modeling energy system emissions scenarios. GEN-X, a system capacity expansion model for investment planning in the power sector, was released in June 2021.
- **MIT.nano: START.nano,** a new pilot program, will support hard-tech ventures in their early stages. Seven companies with nanoscale technologies at their respective cores have been accepted to the program.

### **About the Office of the Vice President for Research**

The OVPR is responsible for the stewardship of MIT’s research enterprise. It seeks to foster strong, mutually beneficial relationships with research sponsors, including federal agencies, Congress, industry, foundations, and foreign governments. The OVPR oversees research administration, policy, and compliance, all executed in a manner to maximize effectiveness and minimize the burden on faculty and research staff. It chairs the Institute Committees on Environmental Health and Safety and Conflict of Interest Policy. The OVPR also oversees more than a dozen interdisciplinary laboratories and centers and is responsible for research computing, postdoctoral services, international scholars, and MIT’s climate action plan.

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