

MIT Portugal Program

Program Background and History

The MIT Portugal Program (MPP) is a multiphase, strategic international collaboration between MIT, Portuguese universities and research institutions, and the Portuguese Ministry of Science, Technology, and Higher Education. The program, launched in 2006 with a second phase beginning in 2013, has continuously demonstrated that an investment in science, technology, and higher education can have a positive impact on the Portuguese economy. Since its establishment, the program has created MIT-quality educational and research opportunities for students, researchers, faculty, and industry partners. Program funding is provided by the Fundação para a Ciência e Tecnologia (FCT, the Portuguese Science and Technology Foundation) with the goal of strengthening the country's knowledge base and international competitiveness through strategic investments in research, education, innovative ideas, and entrepreneurial activities.

Phase two of MPP—led by Professors Dava Newman, Bruce Tidor, and Douglas Hart—was hosted by MIT's Technology and Policy Program in concert with MIT's Institute for Data, Systems, and Society.

The MIT Portugal Partnership 2030 (MPP2030) was launched in June 2018, not as a third phase but as a novel strategic partnership between MIT and FCT. Building on the successes of phases one and two of MPP, MPP2030 continues to support activities designed to have a significant impact on the development of the Portuguese innovation ecosystem and workforce. MPP2030 also touches on MIT strategic areas such as the environment, climate change, and manufacturing. The partnership aims to amplify the global impact of MIT's educational and research activities as noted in [A Global Strategy for MIT](#).

MPP2030 continues to be funded by FCT and is anticipated to run through 2030. The goal of MPP2030 is to strengthen Portugal's knowledge base and international competitiveness through strategic investments in research, people, and ideas in areas of global relevance and with significant societal impact—all while helping MIT faculty and students carry out their research around the world.

This report includes a high-level summary of MPP2030 research and activities between July 1, 2020, and June 30, 2021.

MIT Portugal Partnership 2030 by the Numbers

- 30 new research projects (7 flagship projects, 15 seed projects, 8 exploratory projects)
- 27 initiatives (meetings, idea sprints, webinars, participation in challenges)
- 40 PhD grants (203 applications, 20% admission rate)
- 152 journal publications (7 from flagship projects, 10 from seed projects, 55 from exploratory projects, 80 from past students and projects)
- 860+ participants (260 in person, more than 600 online)
- 57 news publications (website publications, newsletters, social media posts)

Research Activities

Research has been a cornerstone of every MPP phase. From its inception, the program has promoted research projects in MPP's focus areas with the goal of fostering collaborations among Portuguese universities, MIT, and industry. The goals of MPP's research are to complement and strengthen educational programs and stimulate innovation and entrepreneurship. Since MPP's first phase, over 100 research projects, selected through calls for proposals, have been funded in the program's focus areas, including test bed, seed, and flagship projects. MPP2030 continues to focus on fostering research between its key collaborative entities, specifically using data science-intensive approaches and methodologies in the following focus areas:

- Climate Science and Climate Change
- Earth Systems: Oceans to Near Space
- Digital Transformation in Manufacturing
- Sustainable Cities

Overall, 75% of funding covers Earth Systems: Ocean to Near Space and Climate Science and Climate Change, while the remaining 25% covers Sustainable Cities and Digital Transformation in Manufacturing.

The data science approach targets the development of tools to collect, curate, and synthesize data with the goal of making information available and useful for public and private users, including policymakers, consumers, businesses, and the general population.

MPP2030 Year Two Seed Projects: Summer 2020 to Fall 2021

The program's second call for seed proposals opened in December 2020. As with the previous year's proposals, submissions were required to cover at least one of the four MPP2030 research areas, and their maximum total was \$90,000 to be used over the course of one year. A total of 33 proposals were received, and 15 were chosen to be funded.

Due to the research delays brought on by the COVID-19 pandemic, many of the seed projects were kicked off in fall 2020 and will wrap up in September 2021. The 15 funded projects are as follows:

Cold-Water Corals: Exploring Chromium Isotopes as Archives of Intermediate Water Oxygenation (principal investigator [PI]: Edward Boyle, Department of Earth, Atmospheric and Planetary Sciences [EAPS])

A Cross-Cultural Evaluation of the Quality of Urban Spaces to Support the Mobility and Quality of Life of Aging Populations (PIs: Joseph Coughlin and Lisa D'Ambrosio, MIT AgeLab, Center for Transportation and Logistics)

Student Based Collaboration on Environmental Monitoring Flight Systems (PI: John Hansman, Department of Aeronautics and Astronautics)

SoS4Atlantic Multi-Domain Atlantic Ocean-Space Observation: Extended Ocean Observation (PIs: Douglas Hart, Department of Mechanical Engineering; Dava Newman, Department of Aeronautics and Astronautics)

Unlocking Digital Manufacturing at Scale with Cost-Design Analysis Tools and Flexible Organizational Practices (PI: John Hart, Department of Mechanical Engineering)

System of Systems Concept for Effective Oceans to Near Space Observation (PI: Daniel Hastings, Department of Aeronautics and Astronautics)

Planning and Optimization Investments Against Carbon Constraint (PIs: Marija Ilic, Laboratory for Information and Decision Systems; John Parsons, Sloan School of Management)

Cooperative Localization for Sea, Air, and Space (PI: John Leonard, Department of Mechanical Engineering)

Intelligent Observing and Multiscale Modeling for Ocean Exploration and Sustainable Utilization (PI: Pierre Lermusiaux, Department of Mechanical Engineering)

Autonomous Robotic Assembly of Space Structures Using On-Orbit Additive Manufacturing for Near-Earth Observation and Space Environment Missions (PI: Richard Linares, Department of Aeronautics and Astronautics)

Introducing 3D Printing into the Production Chain: Modeling the Effects and Providing Guidance Using Data Analysis and Advanced Modeling (PI: Stefanie Mueller, Department of Mechanical Engineering and Computer Science and Artificial Intelligence Laboratory)

A Computationally Scalable Global Ocean Model (PIs: Jaime Peraire and Cuong C. Nguyen, Department of Aeronautics and Astronautics; Chris Hill, EAPS; Pierre Lermusiaux, Department of Mechanical Engineering)

Producing Methanol as a Sustainable Fuel by Coupling CO₂ Capture and Hydrogenation (PI: Yang Shao-Horn, Department of Mechanical Engineering)

Analyzing the Changing Nature of Extreme Solar and Wind Energy Resource Shortage Events and the Consequences for Climate Change Mitigation (PI: Jessika Trancik, Institute for Data, Systems, and Society)

Climate Change: Beliefs and Social Consequences in Portugal (PI: Siqi Zheng, Department of Urban Studies and Planning [DUSP])

MPP2030 Year 2 Seed Projects: Summer 2021 to Fall 2022

A third call for seed proposals opened on February 17, 2021. Again, submissions were required to cover at least one of the four MPP2030 research areas, and their maximum total was \$90,000 to be used over the course of one year. In all, 27 proposals were received and 13 were chosen to be funded. The funded projects are as follows:

Thresholds That Lead to Abrupt Regional Climate Change (PI: Dara Entekhabi, Department of Civil and Environmental Engineering)

The Effects of Working Conditions on Pollutants during Ammonia Combustion (PI: William H. Green, Department of Chemical Engineering)

Inverse Design and Modeling of Plasma-Assisted CO₂-Conversion Technologies (IMPACT) (PIs: Carmen Guerra-Garcia, Department of Aeronautics and Astronautics; Ahmed Ghoniem, Department of Mechanical Engineering)

System of Systems Concept for Effective Oceans to Near Space Observation (PI: Dan Hastings, Department of Aeronautics and Astronautics)

Planning and Operations of Electric Grid to Support Large Penetration of Solar Power in Mainland Portugal (PIs: Marija Ilic, Laboratory for Information and Decision Systems; Don Lessard, Sloan School of Management)

Climate Change Analytics: Developing a Projects and Policies Data-Driven Toolkit (PI: Janelle Knox-Hayes, Resilient Communities Lab, DUSP)

Data-Driven Discovery of Complex Material Responses for Digital Manufacturing (PI: Gareth McKinley, Department of Mechanical Engineering)

Physics-Based Estimation of Embodied Energy and Carbon in Structural Systems of Urban Building Stocks (PI: Caitlin Mueller, Department of Architecture and Department of Civil and Environmental Engineering)

Intelligent Seaweed Farming Management System Based on Microbiome Data (PI: Stefanie Mueller, Department of Mechanical Engineering and Computer Science and Artificial Intelligence Laboratory)

Ocean Wave Energy Harvesting by an Innovative Proof-Mass Stand-Alone Buoy Converter (PI: Paul D. Sclavounos, Department of Mechanical Engineering)

Integrating In-Situ Chemomechanics and Data Analytics towards New Li-Ion Battery Design Guidelines (PI: C. Cem Taşan, Department of Materials Science and Engineering)

Investigating Extreme Solar and Wind Energy Resource Fluctuations in a Changing Climate (PI: Jessika Trancik, Institute for Data, Systems, and Society)

Climate Risk Perception and Its Impacts on Location Attractiveness and Real Estate Asset Value in Portugal: A Computational Approach Using Social Media, Survey, and GIS Data (PI: Siqi Zheng, DUSP and Center for Real Estate)

Flagship Research Projects

The MPP2030 flagship call for proposals opened in March 2019 as part of a research and development initiative under the program's partnerships with Carnegie Mellon University and the University of Texas at Austin. The Agência Nacional de Inovação (ANI), in collaboration with FCT, was responsible for receiving and analyzing the projects once they were collected in late May 2019. While most details of the proposals received are confidential, ANI disclosed that there were 41 applications (including nine MPP-specific projects) and 184 project collaborators (71 companies and 113 noncorporate entities) and that there was more than €71 million in requested investment (overall). The awards were set up to fund MIT and Portuguese entities separately, and each had comparable budgets for the three-year project duration. The flagship awards were announced in early 2020, with some projects kicking off immediately.

According to FCT, the objective of the flagship projects was “to promote the internationalization of Portuguese universities, research centers and companies, taking advantage of the experience and organizational culture of universities from the United States, specifically the Massachusetts Institute of Technology (MIT), with which international partnerships are established.” Considered proposals were required to involve industrial research and experimental development activities leading to the creation of—or significant improvements in existing—products, services, processes, and systems. Project proposals also needed to demonstrate their contribution to consolidating the intergovernmental Atlantic Interactions initiative as well as the objectives of the United Nations (UN) Sustainable Development Goals. Projects were required to use a data science approach to address one or more of the following industry-related topics:

- **Climate Science and Climate Change:** research aimed at studying, measuring, and modeling the complex dynamics of interactive climate, meteorological, atmospheric, oceanic, terrestrial, and near-Earth systems. The project should include implementation of integrated models and methods of study and analysis of large data volumes.
- **Earth Systems: Oceans to Near Space:** research focused on the Earth’s subsystems, including oceans, land masses, atmosphere, and near space, with a particular emphasis on measurements, technology, and skill development. The aim is to address the critical subsystems of the Earth through technological innovation, use of big data and autonomous systems, and exhaustive analysis of these systems.
- **Digital Transformation in Manufacturing:** research on the multiple aspects of digital transformation that enable new integrated approaches for design, manufacturing, and sustainable adaptive solutions. The aim is to support the development of cyber-physical products and systems, ensuring a better user experience and value creation for the economy and society in general.
- **Sustainable Cities:** research around science, design, and urban engineering with applications in areas such as energy use, improvement of building design, air quality, transport systems, the Internet of Things, total connectivity, and smart cities. The projects need to take advantage of and promote the Atlantic Cities Network (Rio de Janeiro, Luanda, Lagos, Lisbon, Porto, and Boston).

Each MPP proposal was required to have an MIT principal investigator, a Portuguese principal investigator, and a leading company based in continental Portugal. MPP2030 received nine total collaborative project proposals from faculty in the School of Engineering, the School of Science, and the School of Architecture and Planning. Of those nine proposals, four of the projects focused on Earth Systems: Oceans to Near Space, another four on Digital Transformation in Manufacturing, and one on Sustainable Cities. While no projects focused primarily on Climate Science and Climate Change, three did cover that topic as a secondary research area.

The program is promoting all four areas of research for the next three years through the funding of seven large flagship projects. The selected projects (and their MIT principal investigators) are as follows:

Operator: Digital Transformation in Industry with a Focus on the Operator 4.0 (PI: Elazer Edelman, Harvard-MIT Biomedical Engineering Center)

C-Tech: Climate Driven Technologies for Low Carbon Cities (PIs: Christoph Reinhart, Department of Architecture; Jessika Trancik, Institute for Data, Systems, and Society)

Transformer 4.0: Digital Revolution of Power Transformers (PI: Donna Rhodes, Systems Engineering Advancement Research Initiative)

SNOB-5G: Scalable Network Backhauling for 5G (PI: Muriel Médard, Department of Electrical Engineering and Computer Science)

AEROS Constellation: Developing and Launching into Orbit a New Nanosatellite Platform (PIs: Kerri Cahoy, Dava Newman, and Richard Linares, Department of Aeronautics and Astronautics)

K2D: Knowledge and Data from the Deep to Space (PIs: Doug Hart, John Leonard, and Pierre Lermusiaux, Department of Mechanical Engineering; Dava Newman, Department of Aeronautics and Astronautics)

NewSat: Development of a Compact Integrated Sensor and Satellite for Earth Observation (PIs: Luis Fernando Velásquez-García, Microsystems Technology Laboratories; Maria Yang, Department of Mechanical Engineering; Wojciech Matusik, Department of Electrical Engineering and Computer Science)

Idea Sprints and Events

The MIT Portugal Program promotes a series of activities—“idea sprints”—from workshops to competitions that engage and challenge the community to continually invest in cutting-edge research and ideas. The sections to follow provide high-level overviews of MPP2030’s idea sprints from July 2020 to June 2021.

Blue Origin Student Payload Competition

In late 2018, MIT Portugal partnered with aerospace manufacturer Blue Origin to create an opportunity for Portuguese university students to fly their nano-experiments in suborbital space. The first of its kind for MIT Portugal, the competition consisted of two rounds with a final winning team announced in May 2019. The members of the winning team, Team EM²C, were selected to develop their experiment with the help of NanoRacks and Blue Origin support staff. The biggest milestone took place when the group’s experiment went to space aboard Blue Origin’s New Shepard rocket in December 2019.

The program opened its second annual call for the 2020 Student Payload Competition in January 2020. Five competitive submissions were received. The winning team, Microgravity Fine Regolith Experiment (MiFiRE), conducted a research project within the field of planetary geology. The project’s goal was to understand how fine mineral

particles adhere in the microgravity environment of space and how they ultimately start to combine by accretion or coagulation. The team spent the past year working on its payload experiment while waiting for the green light from Blue Origin for the next launch. At the time of this report submission, the payload is still waiting for a flight date. The MIT Portugal Program hopes to partner with Blue Origin in the future to provide this opportunity to another Portuguese student group.

Earth Intelligence Engine Virtual Summer Program

The National Aeronautics and Space Administration (NASA) Frontier Development Lab (FDL), the SETI Institute, and FDL's private sector and space agency partners held their fifth annual research accelerator in summer 2020 in an entirely virtual structure due to the COVID-19 pandemic. The MPP team worked to explore how we might deploy simulation acceleration methods and/or generative computer vision models (such as generative adversarial models) to produce predictions of future climate conditions. The aim was to inform long-term resilience planning strategies. To advance UN Sustainable Development Goals 13, 14, and 15, the team combined physics-based climate models with generative computer vision methods to simulate high-resolution images of Earth under future climate conditions. The tool accessed historical and real-time data from land, ocean, and atmospheric systems, as well as outputs from weather and climate models, to extend and improve existing models. Pairing the climate data with real satellite imagery, the tool produced synthetic, photorealistic satellite images of the modeled regions.

MPP Annual Conference

On October 15, 2020, the MIT Portugal Program held its annual conference at the Pavilion of Knowledge (Ciência Viva Science Centre) in Lisbon. The theme was "Research and Reflection Amid Adversity," and the conference sought to explore and debate the importance of continuing academic and scientific work in the context of adverse events such as the COVID-19 pandemic. For the first time, the MPP annual conference ran in a hybrid format. The conference had over 40 in-person participants and more than 360 online viewers. The virtual format allowed for many more people to participate from many different locations around the globe. The welcome session included remarks by Ana Noronha of Ciência Viva; Pedro Arezes, MPP director in Portugal; and Helena Pereira, president of FCT. The conference featured discussion sessions on Earth and climate sciences as well as a keynote talk ("Climate Emergency and Species Extinction Crisis – An Ocean's Perspective") by Emanuel Gonçalves from the Oceano Azul Foundation.

Dava Newman addressed the conference from Boston and stated that she is proud of all that MPP2030 has achieved, and Zita Martins, an MPP director in Portugal, highlighted the MIT Portugal mission to contribute actively to making Portugal a leading fighter for Earth and nature. In the days leading up to the conference, MPP hosted three thematic and specialized sessions featuring renowned experts in their fields. These sessions allowed participants to learn more about climate science and science communication.



On October 12, in advance of the conference, MPP hosted an informative En-ROADS workshop led by Curt Newton, En-ROADS event facilitator and director of MIT's OpenCourseWare. This workshop allowed participants to visualize the impact of different climate solutions in real time using the En-ROADS Climate Solutions Simulator. The next day, Brandon Leshchinskiy, artificial intelligence and climate researcher at MIT, shared with our community an inspiring presentation on climate change ("EarthDNA's Climate 101") with the goal of creating climate ambassadors. Climate 101, a resource developed by Leshchinskiy in collaboration with MIT Portugal director Dava Newman and EarthDNA, seeks to mobilize young people as educators on issues related to climate change. On October 14, Felice Frankel, science photographer and research scientist at MIT, shared tips on improving the visual communication of research works for journals, publications, and posters. These sessions had over 120 online participants (students, researchers, educators), mostly from Portuguese universities and institutions but also from MIT.

MPP2030 External Review Committee Virtual Meeting

The inaugural meeting of the MPP2030 External Review Committee (ERC) was held virtually on October 19 and 20, 2020. The ERC is chaired by John Beddington, the former UK government chief scientific advisor, and has four members, all with diverse scientific backgrounds. During the meeting, which will take place annually, the MIT Portugal Program was evaluated by its members after sharing its accomplishments to date. The committee's role is to review the research, activities, and outputs of the program. The ERC also makes recommendations for the program in terms of strategy, coordination, and future milestones.

Virtual Climate Research Exchange Meeting

On October 27, 2020, approximately 25 researchers from MIT and Portugal met to educate each other on their climate-specific areas of work and to exchange ideas around future

projects. Participants from Portugal included representatives of the ULisboa Faculty of Sciences, the University of Trás-os-Montes and Alto Douro, Universidade NOVA de Lisboa, the Universidade NOVA de Lisboa, and Instituto Dom Luiz. The meeting was part of a larger effort to create novel collaborations around a main area of MPP research.

Ciência 2020 and 2021

As per custom, MIT Portugal was featured at *Ciência 2020*, which took place on November 3 and 4 in Lisbon. *Ciência* is an annual meeting of Portuguese researchers that promotes broad debates on the main topics and challenges of the current scientific agenda. The main goal of this summit is to stimulate interactions among researchers, the business sector, and the general public.

On November 3, MPP participated in the science and technology summit via an online session, the *Spaceship We Call Planet Earth*, that discussed Earth systems and climate sciences through the perspectives of MIT and Portuguese researchers. The session brought together more than 50 online participants. The year 2020 marked the 50th anniversary of Earth Day, and MIT Portugal was excited to highlight this milestone. We all live aboard spaceship Earth, and as with any other vessel, it is important to monitor its needs and changes.

On November 4, Zita Martins, MPP national co-director, gave a talk about space science and exploration. In parallel with the establishment of protocols with the European Organization for Nuclear Research (CERN) in 1985, the European Southern Observatory (ESO) in 1992, and the European Space Agency (ESA) in 2000, and more recently with the creation of Portugal Space in 2019, the scientific community of Portugal has been growing and strengthening its research in space science and exploration over the past few decades. The November 4 panel aimed at discussing the past, present, and future of these areas in Portugal, with a focus on brainstorming the country's role in the global endeavor toward understanding and exploring space. The panelists included a broad range of experts from academia together with a representative of the International Space Exploration Coordination Group (ISECG).



Finally, during the closing session, there were two talks from MIT faculty members. Eric von Hippel presented on the topic of user/citizen innovation, and Robert Langer presented on biomaterials and how they will change lives.

MIT Portugal was represented at *Ciência 2021* by Portugal program director Pedro Arezes, with both MIT and Portuguese researchers and students attending. On June 29, MIT

Portugal participated in the science and technology summit, which involved a dialogue around space as a new frontier for science and technology in Portugal. The session, titled Crossing the Atlantic through Space, focused on learning about space by diving deeper into research on Earth.

One of the evening sessions, Science and the New Challenges of Space-Climate Interaction: From Earth Observation to Space Climate, featured Zita Martins, MPP national co-director, and Isabel Furtado, a member of the MIT Portugal Governing Committee.

Program Governing Committee Virtual Meeting

The annual Program Governing Committee (PGC) meeting was held virtually on March 29, 2021. The committee, which includes Professors Maria Zuber and Richard Lester, meets each spring to receive an update on the program's activities and proposed future budgets. Due to travel restrictions around COVID-19, the meeting was held virtually. The MIT Portugal team used the opportunity to share the [new promotional video](#) developed earlier in the year.

Space Week at MIT

The MIT Portugal Program had plans to provide student travel sponsorships for five current Portuguese university students to attend Space Week activities on MIT's campus in March 2020. With COVID-19 continuing to delay plans for 2021, Space Week was held in a [virtual format](#) in April, and the originally selected MIT Portugal students were invited to attend the events. The program hopes to host students in person for the 2022 events.

Program Communications

The MIT Portugal coordination offices at the University of Minho and MIT work closely together to promote the program's activities and milestones through curated social media posts, newsletters, and a content-rich website. Communications officer Joana Soares works out of the Portuguese MPP coordination office. Joana works to increase the media presence of the MIT Portugal Program and elevates the program's status through carefully curated social media, email communications, and public relations. In the United States, MIT faculty and researchers are often highlighted in the media for their work as it pertains both directly and peripherally to MIT Portugal. MPP media highlights include the following:

- [“Nanosatellite Thruster Emits Pure Ions”](#) (January 21, 2021, featuring MPP PI Luis Fernando Velásquez-García)
- [“Stefanie Mueller Changes Everything: A Hands-On Class Responds to Covid”](#) (February 19, 2021, featuring MPP PI Stefanie Mueller)
- [“Electric Vehicles Are Poised to Aid Biden in Climate Fight”](#) (February 17, 2021, featuring MPP PI Jessika Trancik)
- [“Yo-yos Offer a First Foray into Manufacturing at Scale”](#) (March 9, 2021, featuring MPP area lead and PI John Hart)
- [“Elisabeth Reynolds Tapped for White House Role, Joining National Economic Council”](#) (March 5, 2021, featuring former MPP PI Elisabeth Beck Reynolds)

- [“3 Questions: Defining the Institute’s Values”](#) (April 2, 2021, featuring MPP PI Daniel Hastings)
- [“How to Replace Everything in the Industrialized World”](#) (April 15, 2021, featuring MPP PI Jessika Trancik)
- [“The Human Scale of Climate Change”](#) (Spring 2021, featuring MPP PI Janelle Knox-Hayes)
- [“More Clean Energy Will Demand Bigger Battery Storage to Power New England Grid”](#) (April 23, 2021, featuring former MPP PI Elsa Olivetti)
- [“MIT Announces New Climate Action Plan for the Next Decade”](#) (May 13, 2021, featuring MPP PGC members Maria Zuber and Richard Lester)

Educational Programs

Historically, MPP has offered a transdisciplinary curriculum in seven graduate education programs (four PhD, three master’s) across its four focus areas (Bioengineering Systems, Engineering Design and Advanced Manufacturing, Sustainable Energy Systems, and Transportation Systems). Since 2017, more than 20 MPP students and scholars have been hosted at MIT. Visiting MPP students conduct part of their thesis research with support from their MIT thesis co-advisors, helping to strengthen collaboration and ties between MIT and Portuguese universities. MPP has also successfully engaged the growing alumni community and conducted surveys among MPP PhD and master’s graduates who have provided valuable information about their professional development and experiences.

While the focus of MPP2030 has predominantly been on collaborative research, the MIT Portugal team worked with its sponsor FCT in spring 2020 to organize a call for PhD applications. In July 2020, MIT Portugal announced the opening of the 2020 call for FCT-MPP2030 PhD grants. Candidates were required to be conducting research in at least one of the four MIT Portugal areas of focus (Climate Science and Climate Change, Earth Systems: Oceans to Near Space, Digital Transformation in Manufacturing, and Sustainable Cities) and/or using data science approaches/methodologies applied to these areas. The call was hosted under the MIT Portugal Partnership 2030, and grants were awarded as “FCT PhD Scholarships.” The awardees were notified on April 23, 2021, and students may have the opportunity to conduct some of their research at MIT in future years.

Program Personnel

MPP2030 MIT Team

- Dava Newman, director (through June 2021) and Apollo Program Professor of Astronautics, Department of Aeronautics and Astronautics
- Douglas P. Hart, co-director and professor of mechanical engineering
- Leah Lovgren, program manager
- Raina K. Puels, administrative assistant II

MPP2030 Research Area Leaders

Climate Science and Climate Change

- Dava Newman
- Douglas P. Hart

Earth Systems: Oceans to Near Space

- Olivier de Weck, professor of aeronautics and astronautics and engineering systems

Digital Transformation in Manufacturing

- John Hart, professor of mechanical engineering, director of the Laboratory for Manufacturing and Productivity, and director of the Center for Additive and Digital Advanced Production Technologies

Sustainable Cities

- Christoph Reinhart, professor of architecture and director of the Building Technology Program

MPP2030 Program Governing Committee

- António M. Cunha, president of the Council of Portuguese Rectors (representative of the Portuguese participating entities)
- Isabel Furtado, CEO of TMG Automotive (Portuguese industry representative)
- Richard K. Lester, associate provost for international activities (MIT senior administration representative)
- Helena Pereira, president of Fundação para a Ciência e a Tecnologia (representative of Fundação para a Ciência e a Tecnologia)
- Maria Zuber, vice president for research (MIT senior administration representative)

MPP2030 External Review Committee

- John Beddington, former UK government chief scientific advisor
- Pascale Ehrenfreund, chair of the German Aerospace Center Executive Board
- Mohan Munasinghe, former vice-chair of the UN Intergovernmental Panel on Climate Change
- Melany Hunt, Dotty and Dick Hayman Professor of Mechanical Engineering, California Institute of Technology

Dava Newman
Director