# MIT-Portugal Program

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's initial phase was launched in 2006; a second phase began in 2013. The program has continuously demonstrated that an investment in science, technology, and higher education can have a positive impact on the Portuguese economy.

Since 2006, 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. Promoting innovation, entrepreneurship, and leadership best practices has become a hallmark of MPP.

The second phase of MPP, which was led by MIT 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. After a successful six-year run, Phase 2 was concluded in June 2019.

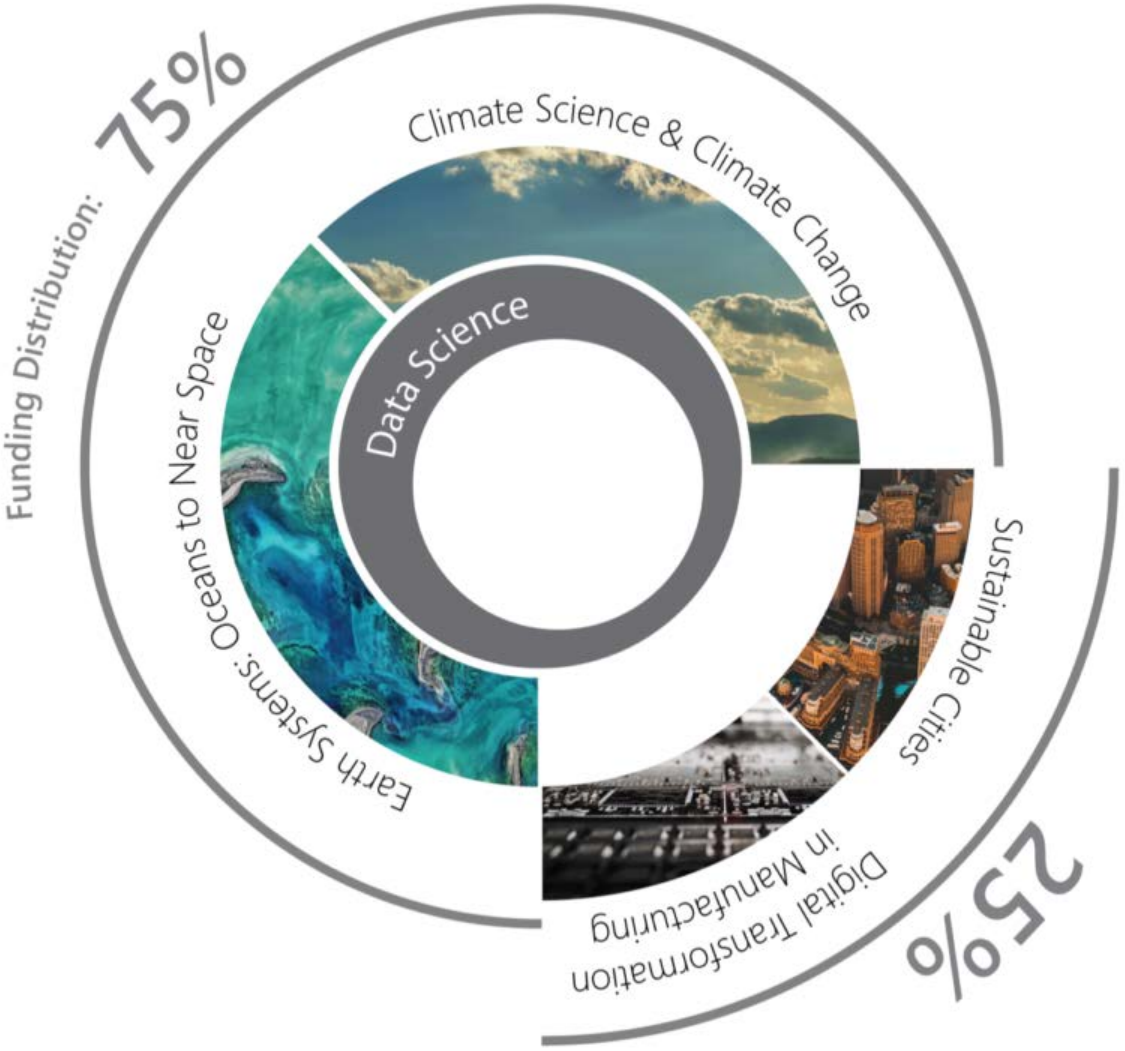
The MIT-Portugal Partnership 2030 (MPP2030) was launched in June 2018, not as a third phase, but as a novel strategic partnership between MIT and the Portuguese government. Building on the success of Phases 1 and 2 of MPP, MPP2030 will continue to support activities designed to affect the development of the Portuguese innovation ecosystem and workforce significantly. MPP2030 also emphasizes areas, such as the environment, climate, manufacturing, and transportation, that MIT considers strategic in amplifying the global impact of MIT's educational and research activities.

FCT continues to fund MPP2030 and is expected to continue doing so until 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 significant societal impact, while helping MIT faculty members and students carry out research around the world. Within the scope of the new partnership, MPP2030 focuses on fostering research between MIT and Portuguese universities, research institutes, laboratories, companies, and other entities in four data-driven focus areas: climate science and climate change; earth systems: oceans to near space; digital transformation in manufacturing; and sustainable cities.

## Research Activities

Research has been a cornerstone of every phase of MPP, as well as of MPP2030. From the start, the program has promoted research projects in MPP's focus areas with the goal of fostering collaborations between Portuguese universities, MIT, and industry. The goals of MPP's research are to complement and strengthen educational programs in Portugal, and to stimulate innovation and entrepreneurship. Since MPP's first phase, more than

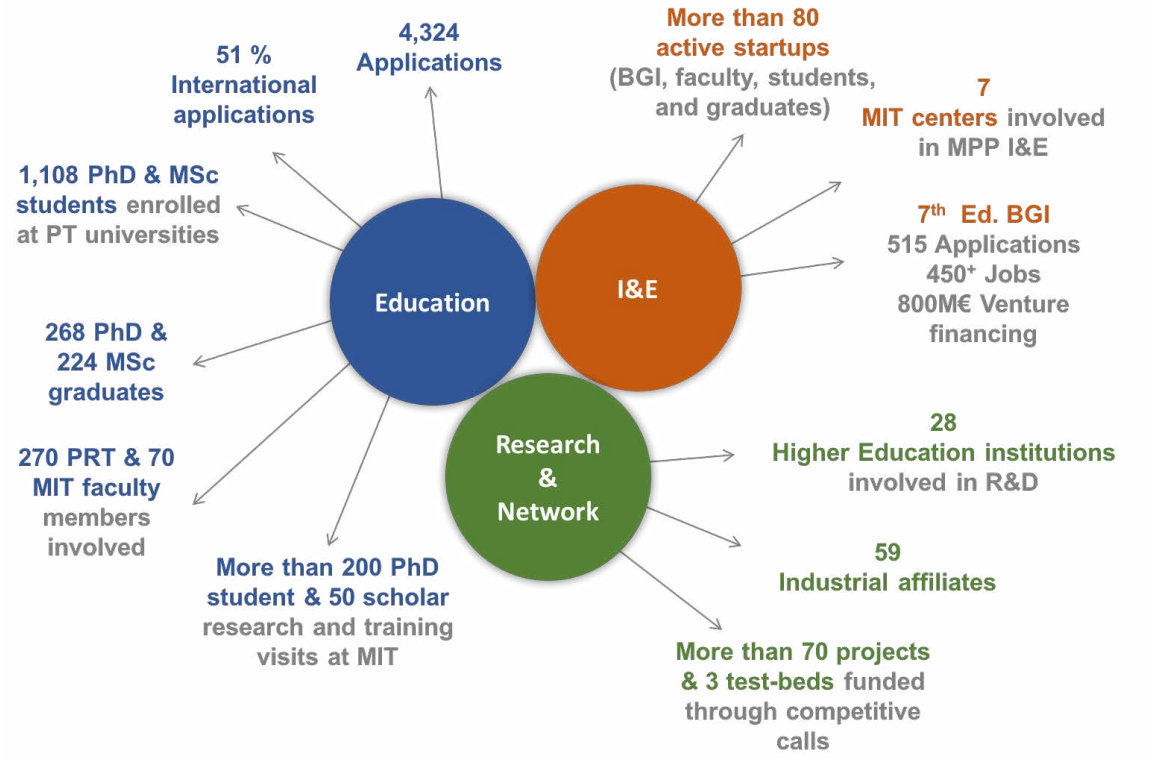
80 research projects, selected through calls for proposals, have been funded in the program's focus areas, including test-bed and seed projects, and, soon, flagship projects. MPP2030 continues to focus on fostering research between its key collaborative entities, specifically using data science–intensive approaches and methodologies in the focus areas of climate science and climate change; earth systems: oceans to near space; digital transformation in manufacturing; and sustainable cities. For the distribution of funding among these areas, see the figure below.




Driven by data science, MPP2030's work should target the development of tools to collect, curate, and synthesize data. The goal is to make the information available and useful for public and private users—including policy makers, consumers, businesses, and the public.

## By the Numbers

To get a sense of the success of MPP and MPP2030, see the figure below.




## Seed Projects—Phase 2: 2018

The 2018 call for one-year seed proposals was opened in late 2017 with funding decisions announced in February 2018. Projects were given a no-cost extension that allowed them to run through June 2019. A total of 16 projects were funded, including the following:

- Rapid, Interactive Robotic Additive Manufacturing of Advanced Materials—John A. Hart and Stefanie Mueller
- Air Pollution Monitoring in the Azores: An Analysis of Past Measurements—Colette Heald
- AUTOSES: Design of Autonomy-Enabled Transportation Systems with Safety Guarantees: Efficiency and Sustainability Trade-offs—Sertac Karaman
- Robust Mapping of Ocean Resources Using Lower-Cost Autonomous Underwater Vehicles—John Leonard
- Engineering Design for Future Space Missions Through the International Space Station Facility—David Miller
- Creating a Cognitive Earth Platform: From Oceans to Air to Space—Dava Newman and Douglas Hart
- Data Mining for Urban Mining: Toward Improved Use of Industrial Byproducts—Elsa Olivetti
- From Big Data to Smooth Mobility: Exploiting High-Resolution Urban Mobility Data to Design the Next Generation of Urban Mobility Decision Making Tools—Carolina Osorio

- Evaluating the Costs and Value of Renewable Energy Combined with Demand-Side Management, Transmission Expansion, and Energy Storage—Jessika Trancik
- Shaping Tomorrow's Great Innovators—Douglas Hart
- Advanced Manufacturing Applications of Shear-Thickening Colloidal Suspensions—Gareth McKinley
- Self-Assembly of Magnetoplasmonic Nanostructures—Caroline Ross
- "Structuration" in Confined Flows of Colloids—James Swan
- Engineering Biosensors for Human Cell Type and State Diagnosis using Synthetic Digital Computation—Tim Lu
- Directed Evolution of Protein Materials for 3D Bioprinter Inks—Bradley Olsen
- Rational and Evolutionary Design of Transcription Factors as Biosensors—Kristala Prather

### Seed Projects—MIT-Portugal Partnership 2030: 2019

A call for seed proposals in the MPP2030 research areas was opened at MIT in December 2018, with all submissions due by February 15, 2019. Proposals were required to cover at least one of the four research areas of MPP2030 and could be for a maximum of $90,000 to be used over the course of one year. The program received 22 proposals and selected 12 projects to be funded. Of the 22 proposals received, 11 involved cross-area research with several projects covering both climate science and climate change and earth systems: oceans to near space. Further, 21 out of the 22 proposals involved Portuguese partnerships. Although the MIT grantees were encouraged to work with Portuguese counterparts, a separate, exploratory call for proposals will be opened in Portugal in late 2019. MPP2030 seed projects at MIT covered only expenses for MIT principal investigators (PIs) and their teams.

On March 15, 2019, the proposal awards were announced. Funding was released immediately to kick-start the first round of research seed projects for MPP2030.

The seed projects are in full motion, running through March 2020. The project titles include:

- Developing Low-Cost, High-Tech Exploration of the Atlantic Ocean—Katy Croff Bell and Joseph Paradiso
- Toward Smart, Sustainable, and Resilient Energy Systems for Coastal Cities—Audun Botterud
- Lead and Lead Isotope Ocean Pollution Histories from Cold Water Corals from the US and Portuguese Continental Margins—Edward A. Boyle
- Collaborative Design for Future Autonomous Underwater Vehicle Servicing Platform—Olivier de Weck

- Surface Climates at Tipping Points: Mapping and Detection of Transitions in Surface Water, Energy, and Carbon Balances—Dara Entekhabi
- Low-Cost Deep Ocean Exploration and Monitoring Utilizing Existing Undersea Cable Networks—Douglas Hart
- Maturing Small Satellite Control Systems for Future Earth Observation and Space Environment Missions Using the International Space Station—Rebecca Masterson
- Sustainable Manufacturing: Re-Programmable Multi-Color Textures for Data-Driven Adaptation of Objects—Stefanie Mueller
- Text and Data Mining for Additive Manufacture—Elsa Olivetti
- Exploring the Relationship Between Digital Technologies and Work in Manufacturing Firms: Co-Evolution and Consequences in Portugal, Brazil, and the US—Elizabeth Beck Reynolds
- Ocean Wave Energy Harvesting Using Machine Learning and Model Predictive Control— Paul D. Sclavounos
- Modeling Synergistic Opportunities for a Sustainable and Electrified Coastal City—Jessika Trancik

### Flagship Research Projects

The MPP2030 flagship call for proposals was opened in March 2019 as part of a research and development initiative under the International Partnerships for Portugal with Carnegie Mellon University, MIT, and the University of Texas at Austin. The Agência Nacional de Inovação (ANI), in collaboration with FCT, was the organization responsible for receiving and analyzing the projects once they were collected in late May 2019. There were 41 applications (nine MPP-specific projects), more than €71 million of requested investment overall, and 184 project promoters—71 were companies and 113 were non-corporate entities. The awards were set up to fund MIT and Portuguese entities separately, each with comparable budgets for the three-year project duration. The flagship proposals are currently being reviewed by ANI; awards will be announced in late 2019.

The objective of these flagship projects, according to FCT, was to promote the internationalization of Portuguese universities, research centers, and companies, taking advantage of the experience and organizational culture of universities from the US, specifically MIT, with which international partnerships are established. Proposals were required to involve industrial research and experimental development activities, leading to the creation of new products, services, processes, and systems. (The activities may also involve the introduction of significant improvements in existing products, services, processes, or systems.) Project proposals were also to demonstrate their contribution to consolidating the intergovernmental initiative known as Atlantic Interactions as well as the UN Sustainable Development Goals. Projects are to use a data-science approach to address one or more of the following focus areas:

- Climate science and climate change—research will aim at studying, measuring, and modeling the complex dynamics of interactive climate, meteorological, atmospheric, oceanic, terrestrial, and near-Earth systems. It will include implementation of integrated models and methods of study and analysis of large data volumes.
- Earth systems: from the oceans to near space—research should focus on the Earth's subsystems, including oceans, land masses, atmosphere, and near space, with particular emphasis on measurements, technology, and skills development, to address the critical subsystems of the Earth through technological innovation, the use of big data, the use of autonomous systems, and the exhaustive analysis of these systems.
- Digital transformation in manufacturing—research should include 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 will involve science, design, and urban engineering with applications in areas such as energy use and improvement of building design, air quality, transport systems, the internet of things, and total connectivity, as well as smart cities. The projects should take advantage of and promote the Atlantic Cities Network—Rio de Janeiro, Brazil; Luanda, Angola; Lagos, Nigeria; Lisbon and Porto, Portugal; and Boston, MA.

Each MPP proposal was required to have an MIT PI, a Portuguese PI, and a continental Portugal-based company as lead. MPP2030 received nine collaborative project proposals from faculty members in MIT's Schools of Engineering, Science, and Architecture and Planning. Of those nine proposals, four were focused on earth systems: oceans to near space, four were focused on digital transformation in manufacturing, and one was focused on sustainable cities. Although there were no projects focused on climate science and climate change, three projects did cover that topic as a secondary research area.

The MPP2030 proposals included:

- AEROS Constellation: Development of a Nanosatellite Platform as a Precursor of a Future Constellation to Leverage the Space/Ocean Scientific and Economic Synergies—Kerri Cahoy with Richard Linares and Dava Newman
- Operator: Digital Transformation in Industry with a Focus on the Operator 4.0—Elazer R. Edelman
- NewSat: Advanced Additive Manufacturing-Enabled, Compact, Integrated Sensor and Satellite for Observation of Earth's Upper Atmosphere—Luis Fernando Velásquez-García with Wojciech Matusik and Maria Yang
- K2D: Knowledge and Data from the Deep to Space—Douglas Hart with Dava Newman, John Leonard, and Pierre Lermusiaux
- Smart Systems for Additive Manufacturing of High-Performance Products—John Hart with Gareth McKinley, Stefanie Mueller, and Cem Tasan

- Scalable Network Backhauling for 5G—Muriel Medard
- SoS4Atlantic: A Multi-Domain Atlantic Ocean-Space Observation System: Science, Technology, and Society—Dava Newman with Douglas Hart, Daniel Hastings, Stephen Barrett, Rebecca Masterson, and Katy Croff Bell
- C-Tech: Climate Driven Technologies for Low-Carbon Cities—Christoph Reinhart with Jessika Trancik
- Transformer 4.0—Donna H. Rhodes

## Innovation and Entrepreneurship

As part of Phase 2 of the MIT-Portugal Program, two "innovation professors," Nuno Arantes-Oliveira and João Bigotte, were recruited from Portugal in 2015. Both have succeeded in strengthening MPP's innovation and entrepreneurship activities and ensuring the program's sustainability. In an effort to further stimulate and advance entrepreneurial activities in Portugal, MPP continued to engage Portuguese start-up companies through multiple channels, educational programs, workshops, and direct interactions with companies and innovation hubs. The program also offered access to the International Workshop on Innovating at MIT in June 2019, which exposed MPP participants and international researchers to hands-on seminars and exercises with the goal of advancing their entrepreneurial mindset and enabling them to make progress with their ventures, projects, and ideas.

### International Workshop on Innovating at MIT, June 2019

The annual International Workshop on Innovating (IWI) at MIT is a hands-on program designed to expose participants to the critical elements that lead to the creation of ventures and the realization of the commercial potential of technologies. The workshop is primarily intended for aspiring and early-stage entrepreneurs, as well as researchers who seek to explore the application and business prospects of their ideas and research. The workshop includes seminars by MIT and other faculty, innovators, and visionaries who have successfully brought ideas to market. Participants will have the opportunity to learn from and interact with experts from the MIT ecosystem and with successful entrepreneurs, who share their insights on critical skills for translational and entrepreneurial success.

This year there were more than 30 participants ranging in age from the early 20s to more than 50, who came from countries as diverse as Portugal, Brazil, Greece, and Ethiopia. The students engaged in a five-day intensive workshop that covered many topics, including primary market research, de-risking technology, building teams, and defining next steps. Participants also attended various events, including a networking and "pitch-to-match" event with students from the Lisbon MBA International program. That program matches Portugal's Católica-Lisbon School of Business and Economics and Nova School of Business and Economics with MIT's Sloan School of Management for a one-year MBA program. Outside the rigorous course schedule, the students went sailing, explored Boston, and participated in the annual IWI Hawaiian shirt contest. MPP2030 hopes to continue this event in the coming years.

## Idea Sprints

The MIT-Portugal Program promotes a series of activities ("idea sprints") from workshops to competitions to engage and challenge the community to invest in cutting-edge research and ideas.

The first idea sprint was the Blue Origin Student Payload Competition. In late 2018, the MIT-Portugal Program partnered with aerospace manufacturer Blue Origin LLC to create an opportunity for Portuguese university students to fly their nano-experiments in suborbital space. The first of its kind for the MIT-Portugal Program, the competition comprised two rounds, with a winning team announced in May 2019. The winning team—Team EM²C —was selected to develop its experiment with the help of support staff from Blue Origin and NanoRacks LLC.

The experiment, officially named "Effect of Microgravity on Microbial Chlorophyll," was created by MIT-Portugal Program students Lígia Fonseca Coelho and Manuel Almeida. Coelho and Almeida hold doctoral degrees in bioengineering from the Instituto Superior Técnico, a school of engineering and technology that is part of the Universidade de Lisboa. They had the help of Jeremy Stroming, a master's degree candidate at MIT's Human Systems Laboratory in the Department of Aeronautics and Astronautics. Team EM²C described their still-in-development experiment:

> The experiment will be on the effects of parabolic flight (such as altered gravity) on the photosynthesis and survival of microorganisms. This is relevant to the current aims of the European Space Agency, and related to current/future European Programme for Life and Physical Sciences in Space (ELIPS) space missions, such as Exocube. Two photosynthetic microorganisms will be used, a cyanobacterial and a microalgal strain, i.e., one prokaryotic and one eukaryotic, respectively. A heterotroph will also be selected as a non-photosynthetic control sample. This experiment, "Effect of Microgravity on Microbial Chlorophyll (EM²C)" will allow comparisons on: 1) How cell compartmentalization affects the ability of photosynthetic cells to cope with microgravity (prokaryotes versus eukaryotes); 2) Whether there is any adaptability difference to microgravity between non-photosynthetic and photosynthetic; and 3) How microgravity affects one of the most important biological phenomena: photosynthesis.

## Selected Events

MPP and MPP2030 have actively promoted and participated in outreach and high-level networking events to engage society and students with science, technology, and innovation. Throughout the year, MPP organized and participated in workshops, conferences, and high-visibility events directed at entrepreneurs, prospective students, industry, government, and other stakeholders. Selected MPP and MPP2030 events are highlighted below, in reverse chronological order.

### *Program Governing Committee Meeting, MIT, March 2019*

In March 2019, MPP2030's inaugural Program Governing Committee meeting was held at MIT. Under the MPP2030 contractual agreement with FCT, the Program Governing Committee has five members, including the president of FCT, Helena Pereira; a representative from participating Portuguese entities, Professor António Cunha; a

leader from Portuguese industry designated by the program's Industrial Advisory Board, Isabel Furtado, chair of TMG Automotive; and two representatives of MIT's senior administration, Professor Maria Zuber and Professor Richard Lester. During the committee's first meeting in March, the group discussed the progress of MPP2030, the upcoming call for proposals, and potential members for the External Review Committee.

### *MIT-Portugal Partnership 2030 Sponsors EarthHack 2019 at MIT, February 2019*

The second annual EarthHack event brought together 30 people committed to mitigating climate change to work for a full day to develop quick, actionable insights using data and design. Held at MIT, the mini hackathon was sponsored by the MIT-Portugal Program and hosted by Professor Dava Newman and the EarthSpeaks team from the Human Systems Laboratory. Participants came from MIT, Harvard University, Georgetown University, the Parsons School of Design, Columbia University, and the Rhode Island School of Design; one held the Knight Science Journalism Fellowship. Participants broke into two teams for the day; one team focused on data and one on design. The data group was assisted by Cait Crawford, a distinguished engineer at IBM who specializes in using data and code to solve societal problems such as maternal deaths in childbirth. The design group was assisted by Gui Trotti, an architect and industrial designer with expertise in designing for extreme environments.

The mini hackathon ran from 8 am to 8 pm. Participants took a break from working sessions to hear from retired astronaut Cady Coleman and glass artist Josh Simpson. Coleman talked about how her experience working with astronauts from other countries taught her how to work better in teams, a skill that was key for the hackathon participants as they formed teams to tackle the problem of climate change. Simpson shared stories about his career as an artist, highlighting his passion for making miniature worlds inside glass globes. At the end of the day, six teams presented their ideas for mitigating climate change. The judges voted on the presentations and selected the top three teams.

### *Minister Manuel Heitor Announces Call for Flagship Proposals, MIT, February 2019*

On February 4, 2019, Manuel Heitor, Portugal's minister of science, technology, and higher education, visited MIT for a full day of activities centered on MPP2030. The primary objective of his visit was to announce the call for flagship project proposals at MIT. Minster Heitor was accompanied by former FCT President Paulo Ferrão, Atlantic International Research Centre Director Joaquin Brito, and a delegation of Portuguese guests from various industries and higher education institutes.

Following his morning announcement to the MIT community, Minister Heitor enjoyed presentations of current seed and test-bed research projects. Presenters included Professor Brian Wardle (Introduction of Advanced Materials Technologies into New Product Development for the Mobility Industries); Professor Christoph Reinhart (SusCity—Urban Data-Driven Models for Creative and Resourceful Urban Transitions), and many others. The day concluded with the guests touring several laboratories on the MIT campus, including the Media Lab's Open Ocean Initiative and Professor John Leonard's Marine Robotics Group.

### *Atlantic International Research Centre, Canary Islands, November 2018*

The AIR Centre's fourth High-Level Industry–Science–Government Dialogue took place in Gran Canaria, Canary Islands, from November 25–27, 2018. The event was dedicated to the AIR Centre. The AIR Centre, a growing international network organization involving governments, academia, industry, and citizens, with headquarters in the Azores, has been working toward the identification of scientific and technical programs, as well as projects and partners. The AIR Centre intends to implement actions to preserve marine and coastal ecosystems for the benefit of all people living along the Atlantic Ocean's shores. MPP Directors Dava Newman and Pedro Arezes, as well as António M. Cunha, a member of the Program Governing Committee, attended this discussion. The dialog was within the framework of two of MPP's focus areas, climate science and climate change and Earth systems: oceans to near space.

### *Industrial Affiliates Workshop, Matosinhos, Portugal, October 2018*

The MPP2030 team held an event with industrial affiliates at the Centre of Engineering and Product Development to present the draft call for proposals for flagship projects and gather feedback from the affiliates. Because industrial affiliates would play a key role in the development of proposals, it was essential to discuss the main concerns about the call for proposals. This meeting was attended by representatives of TMG Automotive, the Centre of Engineering and Product Development, Bosch, DST, Continental, GMV, and Iber-Oleff. In addition to the Portugal-based MPP coordination team, this meeting was attended by MIT MPP Director Dava Newman.

### *MIT-Portugal Annual Conference, Lisbon, Portugal, October 2018*

MPP held an annual conference, the inaugural conference for MPP2030, on October 1 in Lisbon. The conference's theme—an international partnership toward solving the challenges of complex systems—not only recognized the most recent achievements, but also showcased and presented the new scope and targets for coming years. The event was opened by Minister Manuel Heitor; Paulo Ferrão, president of FCT; Professor Dava Newman, MPP2030 director at MIT; and Professor Pedro Arezes, MPP2030 director in Portugal. Other conference presenters included José Moutinho of the AIR Centre and MIT Professors John Hart, Doug Hart, and Jessika Trancik. Students, faculty members, and principal investigators were also given an opportunity to share their research findings. The conference highlighted the importance of innovation and entrepreneurship and its role in the MIT-Portugal Program. The day was concluded with closing remarks by Professor Bruce Tidor of MIT's Office of the Associate Provost for International Activities, and a student poster session award ceremony.

### *Ciência 2018, Lisbon, Portugal, July 2018*

Ciência 2018 is a major science conference that is held annually to highlight achievements in science and technology in Portugal. The 2018 event took place July 2–4 at the Centro de Congressos de Lisboa. Dava Newman, the Apollo Program Professor of Astronautics and Harvard-MIT Health, Sciences, and Technology faculty, gave one of the keynote addresses on the opening day of the conference.

## Program Communications

The MIT-Portugal Program 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. The program is always striving to share the most up-to-date news and information, using the following tools:

- Bimonthly e-newsletters to announce program updates and opportunities, event invitations, and so on;
- Complete redesign of the original MPP website to incorporate the new objectives and research areas of MPP2030; and
- Increase in social media presence (Facebook, Twitter, and LinkedIn) as a secondary platform to promote program activities, meetings, and calls for proposals.

Data on website traffic and social network interactions appear below.

**Website Analytics for MIT Portugal Program: Top 10 Countries by Number of Sessions, 2013–2019**

| | Number of sessions | Percentage of total sessions | Average number of pages per session |
|---|---|---|---|
| **Total** | **575,331** | **NA** | **2.99** |
| Portugal | 285,553 | 49.6% | 3.23 |
| Unites States | 56,959 | 9.9% | 2.48 |
| Brazil | 32,259 | 5.6% | 2.85 |
| India | 17,933 | 3.1% | 2.84 |
| United Kingdom | 16,379 | 2.9% | 2.61 |
| Germany | 13,342 | 2.3% | 3.05 |
| Spain | 11,457 | 2.0% | 2.96 |
| France | 8,438 | 1.5% | 2.49 |
| Italy | 8,256 | 1.4% | 3.11 |
| Netherlands | 5,660 | 1.0% | 2.75 |

**Performance of MIT-Portugal Program's Social Web-Based Platforms**

| Network | Followers (May 2019) |
|---|---|
| Facebook | 6,151 |
| LinkedIn | 3,191 |
| Twitter | 6,566 |

## Educational and Visiting Student Programs

Although MPP2030 has shifted its focus toward research, historically the program has offered trans-disciplinary education curricula in seven graduate education programs (four doctoral programs and three master's degree programs) across four focus areas: bioengineering systems, engineering design and advanced manufacturing, sustainable energy systems, and transportation systems.

As of June 2018, more than 4,300 student applications had been received, including more than 3,500 applications for MPP's doctoral program and more than 700 applications for master's degree programs. International applicants made up 51% of the pool. The average acceptance rate is 24% for the doctoral program and 35% for the master's degree programs. More than 1,100 graduate students have been enrolled at Portuguese partner universities since 2006, and more than 490 students have graduated since the start of the program.

Since 2017, more than 20 MPP students and scholars have visited MIT; since 2006, there have been more than 200 student visits. Visiting MPP students conduct part of their thesis research with support from their MIT thesis co-advisors. MIT faculty members have acted as hosts to visiting MPP scholars on more than 50 scholar visits since 2006. These visits further strengthen existing collaborations among MPP faculty, fostering continued exchange and collaboration in research, education, innovation, and entrepreneurship. MPP has also successfully engaged the growing MPP alumni community and conducted surveys among MPP alumni that provided valuable information about their professional development and experiences.

As Phase 2 of MPP wound down in 2019 and MPP2030 began, visiting students continued to get the most out of their time on campus. In academic year 2019, This year's cohort of MPP students hailed from all over the world, from Porto to Pakistan. Their areas of study included management of engineering systems in times of organizational transformation and rapid change, machine learning and artificial intelligence as applied to critical-care services in hospitals, sustainable energy systems, and much more.

### MISTI Portugal Program

The MIT-Portugal Program kick-started the MIT International Science and Technology Initiatives (MISTI) Portugal Program with initial funding in the summer of 2014. The MISTI Portugal Program allows MIT students to experience Portugal's engineering and science culture firsthand. Opportunities include three- to 12-month paid internships at companies, research institutes, and universities. The first eight MIT students in this MISTI program went to Portuguese organizations during the summer of 2015. Portuguese companies covered the expenses of their visiting students; MISTI and MPP covered expenses for students who visited universities and research institutes.

Alicia Goldstein-Raun, MISTI's managing director for Portugal and Spain, continues to coordinate applications, the placement process, and student–host relationships. In AY2019, five MIT students traveled to Portugal to work at companies, research centers, or universities, bringing the total number of students in the program since 2015 to 29.

## Program Personnel

### MIT-Portugal Partnership 2030 Team

**Dava Newman**
Director, MIT-Portugal Partnership 2030
Apollo Program Professor of Astronautics
Department of Aeronautics and Astronautics
Harvard-MIT Health, Sciences, and Technology

**Douglas P. Hart**
Co-Director, MIT-Portugal Partnership 2030
Professor of Mechanical Engineering

**Leah Lovgren**
Program Manager, MIT-Portugal Partnership 2030

**Raina K. Puels**
Administrative Assistant II, MIT-Portugal Partnership 2030

## MIT-Portugal Partnership 2030 Governing Committee

**António M. Cunha**
President of the Council of Portuguese Rectors
*Portuguese participating entities representative*

Isabel Furtado
Chief executive officer of TMG Automotive
*Portuguese industry representative*

**Richard K. Lester**
MIT Associate Provost for International Activities
*MIT senior administration representative*

**Helena Pereira**
President of Fundação para a Ciência e a Tecnologia
*Fundação para a Ciência e Tecnologia representative*

**Maria Zuber**
Vice President for Research at MIT
*MIT senior administration representative*

**Dava Newman**
**Director, MIT-Portugal Partnership 2030**