Name	Director	Contact	Website	Description
Alliance for Global Sustainability		Karen Gibson kgibson@mit.edu	web.mit.edu/environment/commitment/sustainability.html	Three research universities-the University of Tokyo, the Swiss Federal Institutes of Technology, and MIT-created the Alliance for Global Sustainability (AGS) to develop new, multicultural, strategic approaches to issues in sustainability. In 2001, Chalmers University of Technology joined the AGS as an associate partner. Researchers at the universities collaborate on major research projects that affect economic development and societal well-being worldwide, such as energy for the 21st century, environmentally conscious design and manufacturing, the growth of megacities, and global demand for mobility. The AGS encourages research partnerships with business, government, and nongovernmental organizations, and the sharing of research results.
Building Technology Program	Leon Glicksman		bt.mit.edu	The building industry represents one of the largest enterprises in the country. For example, roughly one quarter of the assets of large U.S. corporations are tied up in buildings and land. About one third of all investment in the U.S. is for construction of commercial and residential buildings and more than one third of the total energy consumed in the U.S. is used in the building sector.Many of these problems are being met both in the U.S. and internationally by innovations in building technology. These innovations, for example, apply recent advances in the fields of materials, manufacturing and thermo-fluid sciences to the construction of new buildings, to the retrofit or rehabitation of existing buildings and to the efficient operation of buildings.The Building Technology Program at the Massachusetts Institute of Technology (MIT) is an interdisciplinary program jointly sponsored by The Department of Architecture (home department) The Department of Civil and Environmental Engineering The Department of Mechanical Engineering
Center for Advanced Nuclear Energy Systems	Mujid S. Kazimi	canes@mit.edu	web.mit.edu/canes	The Center for Advanced Nuclear Energy Systems was established in September 2000 by the Department of Nuclear Science and Engineering and the MIT Energy Laboratory to create through research a better understanding of nuclear energy systems that promise more favorable economics, safety, proliferation resistance and environmental impact. The Center's programs involve the development and application of methods for the design, operation, and regulation of current and advanced nuclear reactors and fuel cycles. This requires advances in knowledge about traditional scientific and technical disciplines, modern methods of systems reliability, probabilistic safety analysis and decision analysis, together with human interactions and management science.
Center for Bits and Atoms	Neil Gershenfeld		cba.mit.edu	MIT's Center for Bits and Atoms is an ambitious interdisciplinary initiative that is looking beyond the end of the Digital Revolution to ask how a functional description of a system can be embodied in, and abstracted from, a physical form. These simple, profound questions date back to the beginning of modern manufacturing and before that to the origins of natural science, but they have revolutionary new implications that follow from the recognition of the computational universality of physical systems. We can no longer afford to ignore nature's capabilities that have been neglected by conventional digital logic; it is at the boundary between the content of information and its physical representation that many of science's greatest technological, economic, and social opportunities and obstacles lie.
Center for Energy and Environmental Policy Research	Richard L. Schmalensee	ceepr@mit.edu	web.mit.edu/ceepr/www	CEEPR promotes rigorous and objective empirical research at MIT on issues related to energy and environmental policy to support decision-making by government and industry. The results of the research are disseminated through publications, workshops, educational programs and other public outreach activities. Economics research at CEEPR is integrated with engineering and science in collaboration with faculty throughout MIT. The relevance and validity of the research is enhanced through cooperation with government and industry associates in countries around the globe.
Center for Global Change Science	Ronald G. Prinn	cgcs@mit.edu	web.mit.edu/cgcs/www	The MIT Center for Global Change Science (CGCS) addresses fundamental questions about the environment and climate processes with a multidisciplinary approach. The Center's goal is to improve the ability to accurately predict changes in the global environment. The CGCS was founded in January 1990, and in 2006 became an independent center in the School of Science. The CGCS seeks to better understand the natural mechanisms in ocean, atmosphere and land systems that together control the Earth's climate, and to apply improved knowledge to problems of predicting climate changes. The Center utilizes theory, observations, and numerical models to investigate climate phenomena, the linkages among them, and their potential feedbacks in a changing climate.
Center for Materials Science and Engineering	Michael F. Rubner	cmse-www@mit.edu	web.mit.edu/cmse	The MIT Center for Materials Science and Engineering is devoted to the design, creation, and fundamental understanding of materials that are capable of enhancing the human experience.
Center for Ocean Engineering	Michael S. Triantafyllou	oe-info@mit.edu	oe.mit.edu	For nearly a century, MIT has been a leading center of ship research and design, and is widely recognized for its contributions in such areas as hydrodynamics, ship structural mechanics and dynamics, propeller design, and overall ship design. The Pratt School of Naval Architecture and Marine Engineering, which was established through a bequest to MIT in 1912, is an integral part of the Department of Mechanical Engineering. Today, MIT is at the forefront of ocean science and engineering, with significant efforts in fluid mechanics and hydrodynamics, acoustics, offshore mechanics, marine robotics and sensors, and ocean sensing and forecasting. In addition, the Naval Construction program provides advanced graduate education on the design of naval ships and vehicles.

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Center for Technology, Policy, and Industrial Development	Joel Moses (acting)		web.mit.edu/ctpid/www	The Center for Technology, Policy, and Industrial Development (CTPID) is building productive partnerships between academia, government, and industry to support global economic growth and to advance policies that preserve the environment and benefit society at large. CTPID's mission is to develop new knowledge, advanced technological strategies, and innovative partnerships that address global industrial and policy issues and to provide an enriched environment for MIT faculty and students to pursue their intellectual interests.
Center for Transportation & Logistics	Yossi Sheffi	ctl-www@mit.edu	ctl.mit.edu	The Center for Transportation & Logistics is part of the Engineering Systems Division in the School of Engineering. The center is widely recognized as an international leader in the field of transportation and logistics. Along with basic contributions to the understanding of transportation system planning, operations and management, its efforts include significant contributions to logistics modeling and supply chain management for shippers; to technology and policy analysis for government; and to management, planning and operations for trucking, railroad, air and ocean carriers.
Center for 21st-Century Energy	John Heywood	Karla Stryker kstryker@MIT.EDU	web.mit.edu/c21ce	The Mechanical Engineering Department's Center for 21st Century Energy is dedicated to developing technology that will move us towards a sustainable energy future. A broad spectrum of energy systems and new technologies will be needed for an orderly transition to energy use of increasing efficiency with a fuel mix of declining carbon intensity. As this century progresses, this mix must increasingly become independent of petroleum, the first of the major fossil fuels likely to become supply limited.
Computer Science and Artificial Intelligence Laboratory	Victor Zue	webmaster@csail.mit.edu	www.csail.mit.edu	Computation lies at the heart of understanding all physical and biological systems. Many solutions to the most challenging problems of our lives, our work, and our world, therefore, are based in computation. MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) studies this vast, compelling field in an effort to unlock the secrets of human intelligence, extend the functional capabilities of machines, and explore human/machine interactions. We apply that knowledge with a long-term lens to engineer innovative solutions with global impact.
Deshpande Center for Technological Innovation	Leon Sandler	deshpandecenter@mit.edu	web.mit.edu/deshpandecenter	The Deshpande Center was established at the MIT School of Engineering in 2002 to increase the impact of MIT technologies in the marketplace. Founded with an initial donation by Jaishree and Desh Deshpande , the Center depends on the financial and professional support of successful alumni, entrepreneurs, and investors to provide a sustainable source of funding for innovative research and guidance to help it reach the marketplace.
Earth Resources Laboratory	Robert van der Hilst	Susan Turbak turbak@erl.mit.edu	eaps.mit.edu/erl	The Earth Resources Laboratory (ERL), founded in 1982, is an applied geophysics research laboratory focusing on applications in energy, the environment, and the characterization of the Earth's upper crust. Activities include theoretical, experimental, and observational research in geophysical imaging, geological process modeling, and the interactions between rock pore systems and migrating fluids. ERL has a staff of about 35, including faculty, research scientists, post-doctoral fellows, and graduate students. In addition, visiting faculty and researchers from universities and industry frequently participate in ERL research and educational activities. The Lab has access to large scale computational resources (ACES) and also houses an Ultrasonic/rock properties. Research projects are in equal measure by the energy industry and government grants.
Earth System Initiative	Dara Entekhabi	esinfo@mit.edu	esi.mit.edu	Humankind faces significant challenges in its efforts to ensure a sustainable future for our planet. The debates about the choices we make are only meaningful if they are grounded on reliable scientific data. The Earth System Initiative (ESI) works to develop this data, fostering collaborations and interdisciplinary research among scientists and engineers in an effort to understand the nature of interactions among physical, chemical, and biological processes on Earth. Our work is organized around the themes of system characterization, system organization, evolutionary processes, and human impacts. Our goal is to help inform society's perceptions and understanding of our planet's future and our role in its evolution.
Electrochemical Energy Laboratory	Yang Shao-Horn	eel@mit.edu	web.mit.edu/eel	The supply of clean and sustainable energy is one of the most important scientific challenges in the 21st century. Most clean and sustainable options such as solar energy, produce electricity, which requires storage in order to link energy supply with energy demand. Our research concerns the science and engineering of electrochemical energy conversion and storage. Direct conversion from electrical to chemical energy in electrochemical devices allows the storage of electrical work in chemical bonds such as hydrogen molecules and lithium. Stored energy can be used to power a wide range of applications from portable electronics to vehicle and stationary applications. However, the energy densities of electrochemical energy technologies are too low and their costs are too high to be competitive for transportation and stationary applications in comparison to combustion-based technologies. Fundamental research on the materials and catalysts that convert and store energy is needed to increase the performance and cost characteristics of electrochemical devices. New concepts for lithium storage materials are needed in order to dramatically amplify the energy and power characteristics of lithium batteries. Fundamental studies are needed to develop catalysts for electro-conversion of small molecules from one form to another (such as oxygen reduction in fuel cells and H2 production from water splitting), which is key to chemical-energy-based conversion and storage technologies.
Fuel Cell Laboratory	Ernest Cravalho	Doris Ann Elsemiller delsemil@mit.edu	web.mit.edu/mecheng/fcp	Innovation in the design of fuel cells and in the application of fuel cell technology for energy conversion in stationary and portable power plants.

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Gas Turbine Laboratory	Zoltan Spakovsky	Holly Anderson heanders@mit.edu	web.mit.edu/aeroastro/labs/gtl	The concept of an MIT Gas Turbine Laboratory was formulated not long after the first jet engines were successfully run. Shortly after the end of the Second World War, Professor J.C. Hunsaker, who was one of the pioneers of aviation in this country and who was a member of the original National Advisory Committee on Aeronautics (the forerunner of NASA), brought together a group of American industries who donated funds for the construction of a laboratory devoted to jet propulsion. A plaque commemorating the 1947 dedication now hangs in the main laboratory. From that beginning, the GTL evolved into what we believe is a world-class institution for teaching and research in aeropropulsion and turbomachinery technology. The research carried out in the laboratory has changed with the interests of the participants, but we have always sought to carry out the type of work that leads, rather than follows, the state of the art. The research at the GTL is focused on advanced propulsion systems and turbomachinery with activities in computational, theoretical, and experimental study of: (1) loss mechanisms and unsteady flows in turbomachines, (2) compression system stability and active control, (3) heat transfer in turbine blading, (4) gas turbine engine noise reduction and aero-acoustics, (5) pollutant emissions and community noise, and (6) MEMS-based high-power-density engines.
Industrial Performance Center	Richard Lester	ipc@mit.edu	web.mit.edu/ipc	The Industrial Performance Center (IPC) is an MIT-wide research unit, based in the School of Engineering. The Center is comprised of faculty members, students and research associates from the Schools of Engineering, Management, Humanities, Arts and Social Sciences, Science, and Architecture and Planning. Our interdisciplinary teams observe, analyze and report on strategic, technological, and organizational developments in a broad range of industries and examine the implications for society and the global economy. The IPC serves as a listening post on industry, monitoring patterns of organizational and technological practice, interpreting them for our partners and sponsors, and bringing our observations and insights to bear on the core disciplines and educational curricula of the Institute. Through our research we seek to help leaders in business, labor, government, and universities better understand global industrial developments and to work with them to develop practical new approaches for strengthening public policies, business strategies, technical practices, and educational programs.
Joint Program on the Science and Policy of Global Change	Henry Jacoby & Ronald Prinn	globalchange@mit.edu	globalchange.mit.edu	Understanding the complex, long-term changes in our land, air, and water requires breakthroughs in measurement, modeling, and prediction. Responding to these changes requires innovative policies that comprehend agriculture, energy needs, trade and finance — along with the political and communications savvy to organize a genuinely global approach. The Joint Program on the Science and Policy of Global Change is MIT's response to these research, analysis, and public education challenges. The Program integrates multidisciplinary expertise from the Center for Energy and Environmental Policy Research and the Center for Global Change Science and collaborates with other major research groups within and outside MIT. In particular, the Marine Biological Laboratory's Ecosystems Center has been a key partner for over a decade. Our cornerstone is the MIT Integrated Global System Model (IGSM) of economic and environmental change. The IGSM is a comprehensive mathematical tool for analyzing global climate change and its social, economic, and environmental consequences.
Laboratory for Electromagnetic and Electronic Systems	John Kassakian	Miwa Suzuki miwas@mit.edu	lees-web.mit.edu/lees	LEES research areas include electronic circuits, components and systems, power electronics and control, micro and macro electromechanics, electromagnetics, continuum mechanics (the interaction of fields with fluids and other deformable media), high voltage engineering and dielectric physics, manufacturing and process control, and energy economics.
Laboratory for Energy and the Environment	Ernest J. Moniz	Amanda Graham agraham@mit.edu	lfee.mit.edu	The Laboratory for Energy and the Environment fosters collaboration among industry, government, academia, nongovernmental organizations, and the public to address not only the complex interrelationships between energy and the environment, but also the technological, economic, and social aspects of sustainable energy development and use. LFEE's mission is to make significant innovative contributions to energy and environmental sustainability, including the improvement of technologies, structures, and policies that will lead to cleaner, more effective, efficient, and equitable products and processes.
Laboratory for Manufacturing and Productivity	Jung-Hoon Chun	Rachel Russell ceara@mit.edu	web.mit.edu/lmp	The Laboratory for Manufacturing and Productivity (LMP) is an interdepartmental laboratory in the School of Engineering with three major goals: * the development of the fundamental principles of manufacturing systems, processes, and machines * the application of those principles to the manufacturing enterprise * the education of engineering leaders.
Laboratory for Ship and Platform Flows			web.mit.edu/flowlab	Ships have been engaged in maritime trade, national defense and leisure for millennia. Their hydrodynamic performance and design is an age-old problem in naval architecture, yet it still presents numerous challenges to the marine hydrodynamics community. Research at the LSPF focuses on the modeling of free surface flows past conventional and high-speed vessels and the estimation of their resistance and seakeeping in deep and shallow waters. Recent studies have concentrated on the coupling of hydrodynamic simulations with modern optimal control theory for the minimization of the motions and the fuel efficient navigation of high-performance and conventional vessels in a stochastic environment. These studies encompass the development of analytical and computational techniques, including the use of the state-of-the-art SWAN (ShipWaveANalysis) Software Suite.

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Media Laboratory			www.media.mit.edu	At the Media Lab, the future is lived, not imagined. In a world where radical technology advances are taken for granted, we design technology for people to create a better future. The Lab comprises rigorous research and graduate degree programs, where traditional disciplines get checked at the door. Future-obsessed product designers, nanotechnologists, data-visualization experts, industry researchers, and pioneers of computer interfaces work side by side to tirelessly invent–and reinvent–how humans experience, and can be aided by, technology.
Microsystems Technology Laboratory	Anantha Chandrakasan	(form on website)	mtlweb.mit.edu	The Microsystems Technology Laboratories (MTL) at MIT is an interdepartmental laboratory supporting research and education in micro- and nano- systems. MTL was established in the mid-1980s inside the Electrical Engineering and Computer Science Department. Over the years, MTL has evolved and grown into an Interdepartmental laboratory reporting to the Dean of the School of Engineering, reaching across the entire Institute.
Nuclear Reactor Laboratory	David Moncton	Tom Newton tnewton@mit.edu	web.mit.edu/nrl/www	The MIT Nuclear Reactor Laboratory (MIT-NRL) is a university laboratory that conducts interdisciplinary research in the areas of advanced fuel and materials for nuclear energy systems, nuclear science, nuclear medicine, and radiation science and technology. The 5 MW MIT Nuclear Research Reactor (MITR) is equipped with experimental facilities available to users both within and outside MIT. We also provide technical assistance for research projects for high school students, undergraduate and graduate students, university researchers and faculty members, and national laboratory users.
Plasma Science and Fusion Center	Miklos Porkolab	info@psfc.mit.edu	www.psfc.mit.edu	The Plasma Science and Fusion Center (PSFC) seeks to provide research and educational opportunities for expanding the scientific understanding of the physics of plasmas, the "fourth state of matter," and to use that knowledge to develop useful applications. The central focus of PSFC activities has been to create a scientific and engineering base for the development of fusion power. Nevertheless, non-fusion applications involving plasmas at the PSFC are numerous and diverse. A recent example is the significant growth of programs in plasma-based technologies, including environmental remediation and hydrogen production.
Research Laboratory of Electronics	6 Co-Directors	hq@rle.mit.edu	www.rle.mit.edu	The Research Laboratory of Electronics (RLE) at the Massachusetts Institute of Technology (MIT) was the first of the Institute's great modern interdepartmental academic research centers. Today, we are one of MIT's largest such organizations, and the most diverse research laboratory at MIT in our scope of intellectual interests. Research in RLE encompasses an extensive range of natural and man-made phenomena, and our projects are both basic and applied. Common among all RLE efforts is an expansive 21st century interpretation of the 20th century term "electronics," starting at the most basic physical realm of particles and quantum physics and extending all the way to sophisticated engineering application technologies relevant to today and critical to tomorrow.
W. M. Rohsenow Heat and Mass Transfer Laboratory		Suzanne Williamson smwillia@mit.edu	web.mit.edu/hmtl/www	Fundamental and applied research in transport phenomena to support energy technologies, electronics thermal management, manufacturing processes, and leading-edge engineering. Research in the lab today focuses on microscale and nanoscale processes, temperature control of electronics, energy efficient buildings, glass fiber formation, high heat flux engineering, and convective transport.
Sloan Automotive Laboratory	John B. Heywood		web.mit.edu/sloan-auto-lab	The Sloan Automotive Laboratory at MIT was founded in 1929 by Professor C.F. Taylor, with a grant from Alfred P. Sloan, Jr., CEO of General Motors, as a major laboratory for automotive research in the US and the world. The goals of the Laboratory are to provide the fundamental knowledge base for automotive engineering and to educate students to become technological leaders in the automotive industry. These goals are achieved through extensive research activities in the areas of internal combustion engines and fuels, fundamental fluid/thermal/combustion studies, and assessment of advanced propulsion and vehicle technologies, and especially their energy consumption and environmental impacts. The research activities are sponsored by the automotive and petroleum industries, by the government, and by private foundations. Examples of engine research themes include improving the performance and emissions of spark-ignited and compression-ignited or diesel engines, understanding fuel-air mixture preparation processes, and engine lubrication studies to reduce friction, wear, and oil consumption. A clean fuels research initiative is under development. Fundamental research interests in combustion include autoignition, hydrocarbon oxidation chemistry, turbulent and laminar flame structure and flame propagation. A major assessment of future automotive technologies (more efficient engines and transmissions, hybrids, fuel cells) and their fuel requirements is
System Dynamics Group	John Sterman		http://scripts.mit.edu/~sdg	The System Dynamics Group was founded in the early 1960s by Professor Jay W. Forrester at MIT. At that time, he began applying what he had learned about systems during his work in electrical engineering to every day kinds of systems. What makes using system dynamics different from other approaches to studying complex systems is the use of feedback loops. Stocks and flows help describe how a system is connected by feedback loops which create the nonlinearity found so frequently in modern day problems. Computers software is used to simulate a system dynamics model of the situation being studied. Running "what if" simulations to test certain policies on such a model can greatly aid in understanding how the system changes over time.