Dean, School of Science

The School of Science has been committed to excellence in education and cutting-edge scientific research since its establishment in 1932, when MIT sought not only to add basic science to its curriculum but also to begin contributing new knowledge to scientific disciplines. To make such a commitment, the School made long-term investments in its faculty, recruiting young scientists, giving them the support they needed to build their research programs, and retaining them as they began to achieve their goals.

Each of the six departments within the School is ranked at the top of its field. Our faculty produces a constant stream of research that seeks to answer fundamental questions about nature, ranging in scope from the microscopic, where a neuroscientist might isolate the electrical activity of a single neuron, to the telescopic, where an astrophysicist might scan hundreds of thousands of stars to find Earth-like planets in their orbits. The significance of our faculty's work is well recognized: in the last two decades, our faculty has been distinguished by 10 Nobel Prizes, one Abel Prize (the equivalent of a Nobel in mathematics), and innumerable other awards for research and service.

However, we now find ourselves facing new challenges to sustaining our commitment to basic science. With declining funding on the horizon, there is temptation to abandon more "abstract" questions about the nature of the world around us to focus our resources on endeavors with more tangible results. But we cannot lose sight of the value inherent in basic research. As educators and researchers, our faculty pursues the great beauty in the universal truths that have been and will be discovered. By cultivating the minds and the resources necessary for basic science at MIT, we safeguard our ability to make transformative advances in science and technology. This year, the School of Science has worked diligently to maintain our investment in the future, through cultivating new academic and research programs and through the accomplishments of our outstanding faculty and staff.

Initiatives and Programs

Center for Brains, Minds, and Machines

The Center for Brains, Minds, and Machines (CBMM), a multi-institutional collaboration headquartered at MIT, aims to create a new field—the science and engineering of intelligence—by bringing together computer scientists, cognitive scientists, and neuroscientists to work in close collaboration. An outgrowth of MIT's Intelligence Initiative, the center's efforts have now evolved into a full-fledged research initiative. In September 2013, the National Science Foundation announced that CBMM was one of three new research centers funded through its Science and Technology Centers Integrative Partnerships program. The vision of this multi-institutional collaboration is to develop a deep understanding of intelligence and the ability to engineer it, to train the next generation of scientists and engineers in this emerging new field, and to catalyze continuing progress in and cross-fertilization among computer science, mathematics and statistics, robotics, neuroscience, and cognitive science.

Transiting Exoplanet Survey Satellite

This year, NASA approved funding for the Transiting Exoplanet Survey Satellite (TESS), a space telescope that will search for planets around distant stars that could support life. TESS team partners include the MIT Kavli Institute for Astrophysics and Space Research, MIT Lincoln Laboratory, and other partners. MIT faculty members in Earth, Atmospheric, and Planetary Science (EAPS), Physics, and Aeronautics and Astronautics have already discovered several exoplanets that could harbor liquid water, which is thought necessary for life. With a planned launch in 2017, the satellite will use an array of wide-field cameras to survey the entire sky, looking for transient dimming of stars, thereby indicating planets passing in front of them. Leadership in this pioneering mission, combined with existing world-class research in solar system formation, planetary atmospheres, and astrobiology, will make MIT an even more important center for exoplanet research.

Simons Center for the Social Brain

The Simons Center for the Social Brain (SCSB) was established with the goal of understanding the neural mechanisms underlying social cognition and behavior and to translate this knowledge of autism-spectrum disorders. The center, led by Newton Professor of Neurosciences Mriganka Sur, is a successor to MIT's Simons Initiative on Autism and the Brain. The mission of the SCSB is to catalyze innovative research to understand the social brain using genetic, molecular, cellular, cognitive, systems, and engineering approaches and to translate this knowledge into improved diagnosis and treatment of autism-spectrum disorders, complex developmental disorders characterized by social interaction deficits, repetitive behaviors, and restricted interests. The social brain shapes our ability to interact with other people. To understand autism and the social brain, neural correlates of social cognition and behavior will be investigated at many levels, including molecules, cells, neural circuits, and brain modules, both in humans and in relevant model organisms and systems.

Education

MIT is exceptional among major research institutions for its dedication to undergraduate education. Unlike most leading schools of science, MIT places great emphasis on hiring and promoting young faculty members and using undergraduate teaching as an important criterion for promotion and tenure. It is not uncommon for our Nobel Prize winners and other top researchers to teach freshman subjects.

Committed to providing undergraduates with a strong science base for studies in their major, the School and its departments participate in and support a variety of programs designed to create more active, student-centered learning environments inside the classroom. For instance, the Department of Physics participates in both the d'Arbeloff Interactive Mathematics Project and the Technology-Enabled Active Learning program, which integrate technology into coursework to help students engage with concepts. Likewise, the Undergraduate Research-Inspired Experimental Chemistry Alternatives curriculum integrates cutting-edge research with core chemistry concepts.

Over the past several years, the School of Science has been working to expand educational and training opportunities for graduate students as well, collaborating with the School of Engineering to create innovative graduate programs in fields in which MIT shows great strength. These programs allow MIT to attract the most talented students in their respective fields and to build cross-disciplinary connections among the Institute's faculty members, departments, and schools.

Biophysics Program

The Biophysics Program trains graduate students in the application of the physical sciences and engineering to fundamental biological questions at the molecular, cellular, and systems levels. The program exemplifies the Institute-wide goal of reducing boundaries between disciplines, spanning the Schools of Science and Engineering, including the Departments of Biology, Biological Engineering, Brain and Cognitive Sciences, Chemical Engineering, Chemistry, Civil and Environmental Engineering, Electrical Engineering and Computer Science, Health Sciences and Technology, Materials Science and Engineering, Mechanical Engineering, Nuclear Engineering, and Physics.

Microbiology

The Microbiology Program is an interdepartmental and interdisciplinary doctoral program in microbial science and engineering encompassing more than 50 faculty members from several departments in the Schools of Science and Engineering. Students receive training in a wide range of approaches to microbiology, including biochemistry, biotechnology, cell and molecular biology, chemical and biological engineering, computational biology, ecology, environmental biology, evolutionary biology, genetics, genomics, geobiology, immunology, pathogenesis, structural biology, synthetic biology, systems biology, and virology. This program integrates educational resources across participating departments, builds connections among faculty with shared interests, and creates an educational and research community for training students in the study of microbial systems.

MITx

To support MIT's ambitious goals to establish leadership in online education through our involvement with edX and our own MITx initiative, faculty members in the School partnered with Sanjay Sarma, Karen Wilcox, and Israel Ruiz on the Institute-Wide Task Force on the Future of MIT Education. In addition, School of Science departments continue to add to MITx curricula. The Department of Earth, Atmospheric and Planetary Sciences launched 12.340x Global Warming Science, a new course led by Professor of Atmospheric Science Kerry Emmanuel. The Department of Physics launched two new courses: 8.EFTx Effective Field Theory, led by Iain Stewart, and 8.05x Mastering Quantum Mechanics, led by Barton Zwiebach.

Molecular and Cellular Neuroscience

The Molecular and Cellular Neuroscience Training Program carries out cutting-edge neuroscience research and education across multiple sub-disciplines, providing critical bridges from the molecular and cellular neuroscience field to neuroengineering, systems neuroscience, genomics, optogenetics, and neurochemistry. The program provides elective offerings in key cross-discipline courses, such as neuroengineering, biochemistry, genetics, systems neuroscience, neuroimaging, cell biology, neural networks, quantitative biology, and neuronal dynamics that complement less formal program aspects and bring faculty and students together with different levels of expertise and technology in studying the brain. The program graduates trainees with unique abilities to solve complex problems in basic neuroscience and neuropsychiatric disease.

Marc A. Kastner Fellowship

President Reif announced the creation of the Marc A. Kastner Fellowship for graduate students, to honor Donner Professor of Physics Marc A. Kastner's outstanding leadership during his tenure as dean of the School of Science, as well as his mentorship and support for graduate students.

Teaching Prizes for Graduate and Undergraduate Education

In order to reward individual faculty members for supporting the Institute's mission to foster strong teaching, the School of Science awards student-nominated professors with the School of Science Prizes in Undergraduate and Graduate Teaching. This year, the School recognized professor of chemistry Timothy Jamison and associate professor of physics Joshua Winn. Professor Jamison was honored for his undergraduate course, 5.12 Organic Chemistry I. Professor Winn was honored for his graduate course, 8.901 Astrophysics I.

Research

The School of Science faculty made significant advances in a broad array of research fields this year, ranging from the search for the Higgs boson to manipulating the memories of mice to creating a rich visual model of the evolution of our galaxy. The following are but a few notable examples.

Samuel Bowring, the Robert R. Schrock professor of geology, pinpointed the date of the end-Permian extinction, which occurred about 252 million years ago and killed off approximately 96% of marine species and 70% of land species. Professor Bowring also found that the extinction lasted 60,000 ± 48,000 years. By sampling rock from ash beds in Meishan, China, he was able to establish that a pulse of light carbon occurred about 10,000 years before the extinction, which likely means there was a massive influx of carbon into the atmosphere that led to ocean acidification and an increase in sea temperatures of 10 degrees Celsius. Because there are multiple theories explaining why the end-Permian extinction, including an asteroid impact, massive volcanic eruptions, or a cataclysmic cascade of environmental events, Professor Bowring's more precise timetable will help researchers to pinpoint the cause of the extinction.

John W. M. Bush, professor of applied mathematics, produced a fluid analog of a classic quantum physics experiment in which electrons are confined in a circular "corral" by a ring of ions. The work suggests that there is some foundation for early quantum physicist Louis de Broglie's theory that the wavelike behavior of particles is due to their being carried on an actual wave of some kind, even though modern physicists have come to reject the theory. The researchers created their hydrodynamic model by filling a shallow tray with a circular depression (the "corral") with oil and vibrating the tray at just below the rate required to generate surface waves. Then, a droplet of the same oil was bounced on the surface, producing waves that pushed the droplet around the surface that was bounded by the corral. Professor Bush found that the statistical description of the droplet's location very closely matched that of an electron in a corral.

Christopher Cummins, professor of chemistry, devised a new process that traps carbon dioxide and transforms it into useful organic compounds by means of a simple metal complex. The new process converts carbon dioxide into a charged carbonate ion, which can react with a silicon compound to produce formate, a common starting point for the manufacture of organic compounds. The process has the potential to enable development of carbon-neutral cycles for renewable energy and to remove pollutants from the air. Because the process is catalyzed by the inexpensive and simple molybdate, the process has more potential for widespread use than current processes that rely on costly noble metals (such as ruthenium, palladium, and platinum) or on common metals modified with complex ligands.

Kerry Emanuel, the Cecil and Ida Green professor of atmospheric science, found that tropical cyclones are reaching their peak intensity farther and farther away from the equator, as is consistent with patterns expected for a warming climate. The shift means that regions farther north and south of the equator will experience more landfalls, potentially resulting in significant losses in life and property. In another study, Professor Emanuel also found that rising levels of greenhouse gas emissions may contribute to a 10% to 40% increase in the frequency of tropical cyclones by 2100 and a 45% increase in power. The findings were a result of creating a predictive model with a much higher resolution than the models currently adopted by the Intergovernmental Panel on Climate Change (IPCC), which are effective in predicting large-scale weather patterns but have a resolution too large for individual cyclones. Professor Emanuel embedded a high-resolution, local storm model within six IPCC global climate models and simulated 600 storms for each model for every year from 1950 to 2005 using weather data from historical records.

Anna Frebel, the Silverman (1968) family career development assistant professor of physics, identified one of the earliest known stars in the universe, SMSS J031300.36-670839.3. The first generation of stars tended to be large and luminous but short-lived, exploding as supernovae soon after they formed out of clouds of mainly hydrogen and helium. The newly discovered star is one of the second generation, formed out of the heavy elements such as carbon, iron, and oxygen spewed out by the supernovae. The newly discovered star contains much less iron and much more carbon than expected. Since first-generation stars likely had lighter elements in their outer layers and heavier elements in their core, Professor Frebel concluded that the progenitor star did not explode energetically, expelling its carbon and retaining its iron. Frebel's discovery suggests that star formation was more diverse than previously believed, since current theories proposed that first-generation stars released all of their chemical elements into space when they exploded.

Richard O. Hynes, the Daniel K. Ludwig professor for cancer research, identified four proteins in the extracellular matrix in tumors that are critical to metastasis. Professor Hynes isolated and analyzed about 1,000 proteins from the extracellular matrix and, after comparing metastatic and non-metastatic breast cancer tumor cells in mice, found several dozen proteins that were abundant in one tumor cell type but not both. Out of five proteins found to be elevated in highly aggressive tumors, four of them were found to be necessary for metastasis. The results may enable new tests that can predict which tumors are more likely to metastasize, as well as help identify new therapeutic targets for metastatic tumors, which are extremely difficult to treat.

Jonathan Kelner, an associate professor of applied mathematics, developed a new algorithm that dramatically reduces the number of operations required to solve the max-flow problem. Max flow is an algorithm that determines the most efficient way of transporting an item through a network (such as data over the Internet), assuming that the connection between any two points has a maximum capacity. However, the size of networks like the Internet has grown exponentially, making the time required to solve max flow with traditional computing techniques prohibitive. Previous max-flow algorithms sent traffic down a single path until capacity was reached, then sent excess traffic down a new path. Professor Kelner's new algorithm studies many paths at the same time, dividing the network into clusters of well-connected nodes and identifying bottlenecks, saving time by focusing on decisions that matter more.

Markus Klute, an associate professor of physics, found new evidence that a particle discovered at CERN in 2012 may, in fact, be a Higgs boson. The 2012 particle was observed in the region of 125–126 gigaelectronvolts (GeV) and was found to decay to fermions in a way that is consistent with the Higgs boson by the Standard Model. However, researchers needed to clarify whether they had detected a single Higgs or many Higgs particles—or if it was a particle of another origin altogether. At the Compact Muon Solenoid (CMS) experiment, protons were fired at each other in a solenoid with a six-meter diameter, with specialized detectors to determine which particles were produced in resulting collisions. The researchers looked for tau leptons, which have a mass of around 1.7 GeV (about 3,500 times heavier than the electron). The strength of a particle's coupling with the Higgs field is dependent on its mass, so decay to a heavier particle like the tau lepton would be easier to detect than decay to a lighter particle such as an electron. Researchers were able to confirm the presence of decay to tau leptons with a confidence level of 3.8 standard deviations (that is, a 1/10,000 chance that the signal would have appeared in the absence of a Higgs particle). Klute and his CMS colleagues hope to increase the confidence level to five standard deviations (1/2,000,000 chance) when the Large Hadron Collider resumes particle collisions in 2015.

Leonid Mirny, associate professor of health sciences and technology and physics, built a comprehensive 3-D model of chromosomes wherein DNA forms tightly compressed loops along a flexible scaffold. Professor Mirny found that cells completely reorganize their DNA for cell division, trading chromosome- and cell type–specific organization for structures that are similar on a macroscopic scale, but always different on a micro scale. Professor Mirny believes the structure is formed in two stages: chromatin (DNA wound around tiny protein beads) first forms loops radiating out from a scaffold of DNA and protein, which then compresses itself along a central axis. Mirny is collaborating with scientists from Northwestern University to test their hypothesis that proteins called condensins drive the first stage of chromosome folding.

Bradley Pentelute, the Pfizer-Laubach career development assistant professor, developed a new system for synthesizing peptide drugs that reduces the time required to add one peptide to a chain from an hour to 30 seconds by adapting synthesis reactions so that they can be done in a continuous flow system. Current methods of synthesizing peptides are slow and cause a major bottleneck in peptide drug development. The new system has storage vessels for each of the 20 naturally occurring amino acids that are connected to pumps that pull the correct amino acid to the reaction chamber. The connecting coils are preheated to 60 degrees Celsius to help speed up the reaction. The resulting product is as pure as that made by existing machines, and the new system can also be used to combine peptides into large synthetic proteins. Pentelute and his collaborators in the Department of Chemistry and the Department of Chemical Engineering have patented their new system, and, with a grant from the Deshpande Center, they are working on its commercialization.

Susan Solomon, the Ellen Swallow Richards professor of atmospheric chemistry and climate science, found that ozone levels have been depleted in the Arctic, but not to the extreme lows observed in Antarctica, thanks in part to international efforts to limit ozone-depleting chemicals. While chlorofluorocarbons (CFCs) have not been in use since they were phased out beginning in 1987, they have remained in the atmosphere. Atmospheric concentrations have peaked and are declining, but several decades will pass before CFCs are completely eliminated and no longer endanger the ozone layer. Using balloon and satellite data from the ozone layer over the Arctic and Antarctic zones, Professor Solomon discovered that Arctic ozone levels did drop significantly during the unusually cold spring of 2011, but not as much as in Antarctica, where air is even colder. Extremely cold weather creates prime conditions for the formation of polar stratospheric clouds, which, when struck by sunlight, spark a reaction between chlorine atoms in CFCs. The study also demonstrated that Antarctica's greater losses in ozone level are the result of reduced levels of nitric acid in colder air.

Susumu Tonegawa, the Picower professor of biology and neuroscience, was able to plant false memories in the brains of mice and demonstrate that the resulting memory traces were identical in nature to those of authentic memories. Using optogenetics, mouse hippocampal cells were engineered to express channelrhodopsin, a protein that activates neurons when stimulated by light, whenever the c-fos gene, necessary for memory formation, was turned on. The mouse was placed in an unfamiliar chamber (A) to allow it to explore and form memories labeled with channelrhodopsin. Then the mouse was placed in a different chamber (B), where it simultaneously received a foot shock and had its Chamber A memory cells activated with light. The mouse was then returned to Chamber A, where it froze in fear because it now falsely remembered being shocked in Chamber B. Neural activity levels were raised in the amygdala, a fear center of the brain that receives memory information from the hippocampus, just as for a genuine memory.

Li-Huei Tsai, the Picower Professor of Neuroscience, discovered that, under the right conditions, HDAC2 inhibitors make memories more malleable. The study suggests HDAC2 inhibitors may be an effective complement to a Post-Traumatic Stress Disorder psychotherapy treatment that helps patients re-experience a traumatic memory in a safe environment to help them make sense of their memories and overcome their fear. Since the drug aids brain plasticity, HDAC2 inhibitors may help patients more effectively form strong memories that override traumatic ones. In previous work, Professor Tsai showed that chromatin (DNA packaged with proteins) undergoes extensive remodeling when new memories are formed, allowing genes connected to memory formation to be activated more readily. This time, Professor Tsai focused on the same structures when traumatic memories are dismantled in mice through retraining. She found that within a 24-hour period, mice placed in a chamber they were trained to fear exhibited greatly increased histone acetylation of memory-related genes as a result of inactivation of HDAC2. HDACs wind DNA around proteins called histones to inhibit expression. However, after 30 days, mice displayed no change in histone acetylation, suggesting only recently formed memories are easily overwritten. Tsai plans to study what happens to memory traces when re-exposure to traumatic memories occurs at different times, especially after memories formed in the hippocampus are transferred to the cortex for longer-term storage. Tsai hypothesizes that the HDAC2 inhibitor may restore the memory to the hippocampus, where it can be extinguished.

Mark Vogelsberger, an assistant professor of physics, worked with researchers at several institutions to develop a massive computer simulation called Illustris that models the universe's evolution on both small and large scales with more accuracy in some measures than any model so far. The model, containing 12 billion visual resolution elements and enough data to require several months and multiple computing centers to run, represents a cube-shaped section of the universe 350 million light-years long on each side, and produces features at 1,000 light years. The model begins with the state of the universe at 12 million years old and simulates the next 13.8 billion years of cosmic change. Illustris models 41,416 galaxies, closely matching the rate at which different types of galaxies develop in the universe as a whole. Researchers are able to use the resolution elements to create simulated images and then compare those to actual images of the known universe. Until Illustris, cosmologists have not been able to produce galaxies like the Milky Way in their simulations, and they have debated whether that failure was attributable to factors such as dark matter physics, unknown stellar feedbacks, or difficulties in simulating the highly nonlinear multi-scale process of galaxy formation.

Feng Zhang, the W.M. Keck career development professor in biomedical engineering, and David Sabatini, the Howard S. and Linda B. Stern career development professor, developed a system that permanently and selectively deletes genes from a cell's DNA. CRISPR offers an attractive alternative to the most common method of studying gene function, RNA interference (RNAi). RNAi is not capable of completely depleting protein expression of the target gene, since RNAi targets mRNA rather than DNA. CRISPR utilizes a naturally occurring protein, Cas9, to recruit short RNA guides to bind the DNA to be cut. CRISPR allows for precise control over which gene is disrupted, depending on the sequence of RNA guide used, enabling scientists to take on the more comprehensive and complex genetic manipulations required by detailed analysis of genetic circuits.

Events

Dean's Colloquium

The Dean's Colloquium is a series of lectures designed to recognize scientists who began careers in science but have outstanding accomplishments outside of scientific research. This year's lecture featured professor of applied mathematics and Akamai CEO Tom Leighton. In his talk, "Akamai: From Theory to Practice," Leighton traced the founding of Akamai from algorithm research developed in MIT's Department of Mathematics and the Laboratory for Computer Science in 1995 to its present-day status as the leading cloud platform for helping enterprises provide secure, high-performing user experiences on any device, anywhere.

School of Science Breakfast Series

This year, the School of Science continued its successful Breakfast Series, featuring faculty members and research from around the School. In the fall, Troy Van Voorhis, professor of chemistry, spoke on "Using Chemistry to Harness the Power of the Sun," explaining how his research on the microscopic process that underpins photosynthetic light harvesting, LEDs, molecular conductors, and electrocatalysis may help the world meet its large and rapidly growing energy needs. In the spring, Kay Tye, assistant professor of neuroscience, gave a lecture, "Controlling Neural Circuits with Light: A Window into Psychiatric Disease," showing how her work on identifying the effects of motivational stimuli on specific neural circuits points the way to more effective treatments with fewer adverse side effects for mental disorders such as anxiety, addiction, and depression.

Awards and Honors

Faculty Awards and Honors

Every year, academic and professional organizations honor numerous School of Science faculty members for their innovative research, as well as their service to the community. Because this past year was no exception, the individual reports from the School's departments, labs, and centers will document these awards more completely. Several notable awards deserve mention here.

Stephen L. Buchwald, the Camille Dreyfus professor of chemistry, was awarded the 2014 Linus Pauling Medal by the American Chemical Society for "outstanding contributions to chemistry meriting national and international recognition."

Sallie "Penny" Chisholm, professor of biology and the Lee and Geraldine Martin professor of environmental studies, received MIT's James R. Killian Jr. Faculty Achievement Award for her 1988 discovery that more than half of the world's atmosphere originated with a photosynthetic microorganism called Prochlorococcus.

Alan Guth, the Victor F. Weisskopf professor of physics, was awarded the 2014 Kavli Prize in Astrophysics for his "pioneering theory of cosmic inflation." He shares his $1 million prize with Andrei Linde of Stanford University and Alexei Starobinsky of the Landau Institute for Theoretical Physics in Russia.

Jeremy Johnson, assistant professor in the Department of Chemistry, was selected to receive a 3M Non-tenured Faculty Award.

George Lusztig, the Abdun-Nur professor of mathematics, was awarded the $1 million 2014 Shaw Prize in Mathematical Sciences "for his fundamental contributions to algebra, algebraic geometry, and representation theory, and for weaving these subjects together to solve old problems and reveal beautiful new connections."

John Marshall, the Cecil and Ida Green professor of oceanography, was awarded the 2014 Sverdrup Gold Medal of the American Meteorological Society for his "fundamental insights into water mass transformation and deep convection and their implications for global climate and its variability."

Miklos Porkolab, director of the MIT Plasma Science and Fusion Center and professor of physics, was awarded the 2013 Hannes Alfvén Prize "for his seminal contributions to the physics of plasma waves and his key role in the development of fusion energy."

Sara Seager, Class of 1941 professor of physics and planetary science, was named a 2013 MacArthur Fellow for "quickly advancing a subfield initially viewed with skepticism by the scientific community. A mere hypothesis until the mid-1990s, nearly 900 exoplanets in more than 600 planetary systems have since been identified, with thousands of more planet candidates known."

Senthil Todadri, professor of physics, was named a 2013 Simons Investigator.

Kay Tye was named a recipient of the Director's New Innovator Award by the National Institutes of Health. She will use the $1.5 million award to further her innovative work on neural circuits related to addiction and obesity.

Feng Zhang was named the recipient of the Alan T. Waterman Award by the National Science Foundation for his development of the pioneering CRISPR gene editing system as well as his work on optogenetics. He received a Young Investigator Award from the Vallee Foundation and was named one of the "Brilliant 10" for 2013 by *Popular Science.*

The following professors were elected members of the American Academy of Arts and Sciences: Keith Nelson (Chemistry), Paul Seidel (Mathematics), Gigliola Staffilani (Mathematics), and Robert van der Hilst (EAPS).

Thomas Herring (EAPS) was elected as a fellow of the American Association for the Advancement of Science.

The following professors were elected as members of the National Academy of Sciences: Emery Brown (Brain and Cognitive Sciences [BCS]), Alan Grossman (Biology), and Timothy Grove (EAPS).

The following professors were named 2014 Sloan Research Fellows: Gloria Choi (BCS), Mircea Dinca (Chemistry), Jeremiah Johnson (Chemistry), and Kay Tye (BCS).

School of Science Rewards and Recognition

The School of Science Rewards and Recognition Program continues to acknowledge the dedication and hard work of the people who fill our departments, labs, and centers and whose efforts are the source of our prestige. The School continues its Spot Awards, which rewards employees "on the spot" for going beyond the requirements of their normal duties. The Infinite Mile and Infinite K Awards recognize School of Science employees for their dedication to the School and their willingness to go far beyond the extra mile to accomplish everything that needs to be done.

Personnel

Appointments and Promotions

Michael Sipser, the Barton L. Weller professor of mathematics, was named dean of the School of Science. Sipser succeeded Marc A. Kastner, the Donner professor of physics, on Kastner's nomination by President Barack Obama to head the Department of Energy's Office of Science.

Professor Peter Fisher was named head of the Department of Physics, succeeding Edmund Bertschinger, who took on a new role as Institute Community and Equity Officer.

Alan D. Grossman, the Praecis professor of biology, was appointed interim head of the Department of Biology.

Tomasz S. Mrowka, the Singer professor of mathematics, was appointed interim head of the Department of Mathematics.

The following faculty members were promoted to full professor: Scott Hughes (Physics), Hong Liu (Physics), Alexander Postnikov (Mathematics), Alice Ting (Chemistry), and Benjamin Weiss (EAPS). Mei Hong will be joining the Department of Chemistry as a full professor.

The following professors were granted tenure: Tanja Bosak (EAPS), Laurie A. Boyer (Biology), Iain M. Cheeseman (Biology), Jacob Fox (Mathematics), Jonathan Kelner (Mathematics), Paul O'Gorman (EAPS), J. Taylor Perron (EAPS), and Jeroen Saeij (Biology).

The following professors were promoted to associate professor without tenure: Laurent Demanet (Mathematics), Oliver Jagoutz (EAPS), Markus Klute (Physics), Elizabeth Nolan (Chemistry), Sug Woo Shin (Mathematics), and Matthew Vander Heiden (Biology).

Nikta Fakhri (Physics), Gabriela Schlau-Cohen (Chemistry), Alex Shalek (Chemistry), Jeffrey Van Humbeck (Chemistry), and Omer Yilmaz (Biology) will be joining the School of Science faculty as assistant professors. In addition, Joseph Checkelsky (Physics), Ibrahim Cissé (Physics), Gloria Choi (BCS), and Mark Vogelsberger (Physics) joined the faculty as assistant professors in January 2014.

Faculty Lunch Programs

Tenure-track faculty lunch meetings are intended to help junior faculty meet their peers in different departments and to provide a forum for discussion of important issues. This year, several faculty members presented their research, while other meetings covered such topics as reading and writing letters of recommendation, the promotion process, and MIT initiatives.

School of Science Learn@Lunch Series

To provide administrative staff the support they need to do their jobs as effectively as possible, the School of Science holds a monthly lunch series for staff members on a variety of subjects. In the fall, the program focused on health and safety, and in the spring it focused on community equity and inclusion.

School of Science Peer Connections

The Peer Connections Program pairs new School of Science staff with mentors who can help them navigate job responsibilities, MIT policies and procedures, and Institute organization and culture. The program provides opportunities for both mentors and new employees to expand their skill sets, increase their confidence, and make connections with School of Science community members outside of their home department, lab, or center.

Michael Sipser
Dean
Barton L. Weller Professor of Mathematics