Adi Ashkenazi, Postdoctoral Associate (Hen Group), was named a 2018 Fermilab Intensity Frontier Fellow 2018; and received the Israel National Postdoctoral Award for Advancing Women in Science.

John W. Belcher, Class of 1922 Professor of Physics, received a 2019 Teaching with Digital Technology Award of the MIT Office of Digital Learning “for electromagnetism simulations.”

Arup K. Chakraborty, Robert T. Haslam Professor of Chemical Engineering, Physics, Chemistry, and Biological Engineering, received an Honorary Doctorate from the Hong Kong University of Science and Technology (2019).

Joseph Checkelsky, Associate Professor of Physics, received a 2019 Early Career Award for Scientists and Engineers (ECASE-ARMY).

Ibrahim Cissé, Class of 1922 Career Development Associate Professor of Physics, received the 2019 Everett Moore Baker Award for Excellence in Undergraduate Teaching; the 2019 Human Frontier Science Program Award; and was named in Science News’s “10 Scientists to Watch” (2018).

Riccardo Comin, Assistant Professor of Physics, was named Class of 1947 Career Development Professor.

Markus Ebert, Postdoctoral Associate (Stewart Group), received a Feodor Lynen Research Fellowship from the Humboldt Foundation.

Matthew Evans, Associate Professor of Physics, was awarded a 2019 New Horizons in Physics Breakthrough Prize “for research on present and future ground-based detectors of gravitational waves.”

Nikta Fakhri, Thomas D. and Virginia W. Cabot Career Development Assistant Professor of Physics, was awarded the 2018 IUPAP Young Scientist Prize in Biological Physics.

Critiano Fanelli, Postdoctoral Associate (Williams Group), was awarded the Jefferson Lab Postdoctoral Prize; and received a Jefferson Lab Electron-Ion-Collider Fellowship.

Anna Frebel, Silverman (1968) Family Career Development Associate Professor of Physics, received MIT’s Earl M. Murman Award for Excellence in Undergraduate Advising.
Liang Fu, Lawrence C. (1944) and Sarah W. Biedenharn Career Development Associate Professor of Physics, received the 2018 Simons Investigator Award in Physics.

Nuh Gedik, Professor of Physics, received the Visiting Miller Professorship Award from the University of California, Berkeley.

Daniel Harlow, Assistant Professor of Physics, was awarded a 2019 New Horizons in Physics Breakthrough Prize “for fundamental insights about quantum information, quantum field theory and gravity”; and received a 2018 Sloan Research Fellowship from the Alfred P. Sloan Foundation.

Or Hen, Assistant Professor of Physics, was awarded the 2019 IUPAP Young Scientist Prize in Nuclear Physics “for extending our knowledge and understanding of short-range correlations in nuclei, and for the discovery of a remarkable linear relationship between high-momentum correlations and the deviation of the quark momentum in a heavy nucleus.”

Jacqueline Hewitt, Julius A. Stratton Professor in Electrical Engineering and Physics, was elected a Fellow of the American Association for the Advancement of Science (2018).

Pablo Jarillo-Herrero, Cecil and Ida Green Professor of Physics, was elected a Fellow of the American Physical Society; named winner of the 2018 Physics World Breakthrough of the Year Award; and named a 2018 Highly Cited Researcher by Clarivate Analytics.

Mehran Kardar, Francis Friedman Professor of Physics, was awarded the 2019 Ellis Island Medal of Honor.

Maxim Metlitski, Assistant Professor of Physics, received a 2018 National Science Foundation Career Award.
Kerstin Perez, Assistant Professor of Physics, was named Class of 1948 Career Development Professor; was awarded the 2018 MIT School of Science Teaching Prize for Undergraduate Education; and received a 2019 Cottrell Scholar Award of the Research Corporation for Science Advancement “to optimize searches for astrophysical X-ray signatures of sterile neutrinos using the NuSTAR satellite observatory.”

Iain Stewart, Professor of Physics; Director, Center for Theoretical Physics; and Interim Division Head, Theoretical Nuclear and Particle Physics, received a Simons Investigator in Physics five-year appointment renewal by the Simons Foundation.

Yong Zhao, Postdoctoral Associate (Stewart Group), received a 2019 Infinite Kilometer Award of the MIT School of Science.

Martin Zwierlein, Thomas A. Frank (1977) Professor of Physics and Division Head, Atomic, Biological and Condensed Matter Physics, was awarded a 2019 Vannevar Bush Faculty Fellowship by the U.S. Office of Naval Research.

Xiao-Gang Wen, Cecil and Ida Green Professor of Physics, was awarded the 2018 ICTP Dirac Medal.
Promotions

Joseph Checkelsky to Associate Professor of Physics without tenure.

Ibrahim Cissé to Associate Professor of Physics without tenure.

William Detmold to Associate Professor of Physics with tenure.

Tracy Slatyer to Associate Professor of Physics with tenure.

Michael Williams to Associate Professor of Physics with tenure.
Since attending the Bronx High School of Science, Edward Farhi has trained as a theoretical particle physicist (SB, Brandeis University; PhD, Harvard University) but has also worked on astrophysics, general relativity and the foundations of quantum mechanics. His present interest is the theory of quantum computation.

As a graduate student, Farhi invented the jet variable “Thrust,” which is used to describe how particles in high energy accelerator collisions come out in collimated streams. He then worked with Leonard Susskind on grand unified theories with electro-weak dynamical symmetry breaking. He and Larry Abbott proposed an (almost viable) model in which quarks, leptons and massive gauge bosons are composite. With Robert Jaffe, he worked out many of the properties of a possibly stable super dense form of matter called “Strange Matter” and with Charles Alcock and Angela Olinto he studied the properties of “Strange Stars.” His interest then shifted to general relativity and he and Alan Guth studied the classical and quantum prospects of making a new inflationary universe in the laboratory today. He, Guth and others also studied obstacles to constructing a time machine.

Since the late ‘90’s, Farhi has been studying how to use quantum mechanics to gain algorithmic speedup in solving problems that are difficult for conventional computers. He and Sam Gutmann pioneered the continuous time Hamiltonian based approach to quantum computation which is an alternative to the conventional gate model. He and Gutmann then proposed the idea of designing algorithms based on quantum walks, which was used to demonstrate the power of quantum computation over classical. They, along with Jeffrey Goldstone and Michael Sipser, introduced the idea of quantum computation by adiabatic evolution which generated much interest in the quantum computing community. For example, the D-Wave machine is designed to run the quantum adiabatic algorithm. In 2007, Farhi, Goldstone and Gutmann showed, using quantum walks, that a quantum computer can determine who wins a game faster than a classical computer. In 2010, he along with Peter Shor and others at MIT introduced a scheme for Quantum Money which so far has resisted attack. In 2014 Farhi, Goldstone and Gutmann introduced the Quantum Approximate Optimization Algorithm (QAOA), a novel quantum algorithm for finding approximate solutions to combinatorial search problems. The QAOA is viewed as one of the best candidates to run on Noisy Intermediate Scale Quantum devices which are coming online in the near future.

A winner of multiple MIT teaching awards, Farhi also served as the Director of the Center for Theoretical Physics from 2004-2016. He is now a principal scientist at Google working on quantum computation.
Ibrahim I. Cissé, the Class of 1922 Career Development Assistant Professor of Physics, received the Institute’s 2019 Everett Moore Baker Award for Excellence in Undergraduate Teaching. The only teaching award for which the nomination and selection of recipients is done entirely by students, it recognizes a faculty member’s “exceptional interest and ability in the instruction of undergraduates.”

Cissé was nominated for his efforts in Physics 8.01, a first-year General Institute Requirement subject. Students noted his energy, enthusiastic approach to problem-solving, and “crystal-clear mastery of the subject.” They also appreciated Cissé’s patient teaching style that encouraged students to problem-solve, rather than to memorize a specific set of conditions.

One student recalled Cissé’s animated teaching style, such as when he ran in circles to help them understand centripetal acceleration. In another class, Cissé had students push him around in a chair to illustrate various forces in play. Another wrote, “He brought so much energy to the TEAL classroom…and when he noticed us starting to get tired, he had all of us get out of our seats and jump up and down.”

Cissé said he was honored by this recognition. “I teach first-year students after they have just left their families, and as a professor I take it seriously that they are integrated into the MIT family.”

Other Physics faculty winners of the Baker Award include Professors Tracy Slatyer (2017); Allan Adams (2013); Krishna Rajagopal (2011); Eric Hudson (2008); Barton Zwiebach (2002); and Alan Guth (2000). The Baker Award’s first recipient was physics professor Alan Lazarus (1963), followed by future Nobel Laureate Rai Weiss (1968). The award is made possible by the Everett Moore Baker Memorial Foundation, which serves to perpetuate the memory and ideals of Everett Moore Baker, MIT’s dean of students from 1947 to 1950. (S. Miller)