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ON CAMPUS AND AROUND THE WORLD

Top row, left to right: Stephen Bell, Sangeeta Bhatia, and Christopher Cummins. Bottom row, left to right: Esther Duflo, Klavs Jensen, and Nergis Mavalvala.

National Academy of Sciences elects six MIT professors for 2017

Bell, Bhatia, Cummins, Duflo, Jensen, and Mavalvala honored for research achievements.

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Six MIT faculty members have been elected to the National Academy of Sciences (NAS) in recognition of their “distinguished and continuing achievements in original research.”

MIT’s six new NAS members are: Stephen Bell, a professor of biology; Sangeeta Bhatia, the John and Dorothy Wilson Professor of Health Sciences and Technology and Electrical Engineering and Computer Science; Christopher Cummins, the Henry Dreyfus Professor of Chemistry; Esther Duflo, the Abdul Latif Jameel Professor in Poverty Alleviation and Development Economics; Klavs Jensen, the Warren K. Lewis Professor in Chemical Engineering; and Nergis Mavalvala, the Curtis and Kathleen Marble Professor of Astrophysics.

The group was among 84 new members and 21 new foreign associates elected to the NAS. Membership in the NAS is one of the most significant honors given to academic researchers.

Stephen P. Bell

Bell is a leader in the field of DNA replication, specifically in the mechanisms controlling initiation of chromosome duplication in eukaryotic cells. Using a powerful combination of genetics, genomics, biochemistry, and single-molecule approaches, Bell has provided a mechanistic picture of the assembly of the bidirectional DNA replication machine at replication

origins. His work has provided critical insights into the mechanisms that ensure that DNA is copied once, and only once, per cell cycle in all eukaryotic cells, including human cells, and has implications for human diseases and conditions ranging from dwarfism to cancer.

After completing a PhD at the University of California at Berkeley and postdoctoral research at Cold Spring Harbor Laboratory, Bell joined the MIT biology faculty in 1994. Bell is a Howard Hughes Medical Institute investigator and has been distinguished with several awards and honors, among them the 2001 ASBMB-Schering Plough Scientific Achievement Award and the 2009 National Academy of Sciences Award in Molecular Biology.

Sangeeta Bhatia

Trained as both a physician and engineer, Bhatia is a member of MIT's Koch Institute for Integrative Cancer Research and Institute for Medical Engineering and Science. Her laboratory is dedicated to leveraging miniaturization tools from the world of semiconductor manufacturing to impact human health. She has pioneered technologies for interfacing living cells with synthetic systems, enabling new applications in tissue regeneration, stem cell differentiation, medical diagnostics, and drug delivery. Her team has developed human microlivers that model human drug metabolism, liver disease, and interaction with pathogens. The group also develops nanoparticles and nanoporous materials that can be designed to study, diagnose, and treat cancer and other diseases.

Bhatia earned a bachelor's degree from Brown University, a PhD from MIT, and an MD from Harvard University. She is also a Howard Hughes Medical Institute investigator, an affiliated faculty member of the Harvard Stem Cell Institute, an institute member of the Broad Institute, and a biomedical engineer at the Brigham and Women's Hospital. She is an elected member of the National Academy of Engineering, the American Academy of Arts and Sciences, and the National Academy of Inventors. Her many awards include the 2014 Lemelson-MIT Prize; the 20th Heinz Award for Technology, the Economy, and Employment; the David and Lucile Packard Fellowship; and the NSF CAREER Award.

Christopher "Kit" Cummins

Cummins develops synthetic methods that create novel molecular substances, focusing on the activation of small, stable molecules through transition metal systems, particularly with respect to synthetic nitrogen fixation, carbon dioxide reduction, and phosphorous utilization. His work has important implications in a variety of fields, ranging from solar energy technology to exploratory synthesis investigations involving interstellar molecules generated using molecular precursors.

Cummins received received a bachelor's degree from Cornell University in 1989 and PhD from MIT in 1993. Later that year, he joined the MIT faculty in the Department of Chemistry. Cummins has been elected to membership in the American Academy of Arts and Sciences, and his work has received various awards, including the ACS F. Albert Cotton Award in Synthetic Inorganic Chemistry, the Raymond and Beverly Sackler Prize in the Physical Sciences, and the Alan T. Waterman Award.

Esther Duflo

Duflo is a co-founder and co-director of the Abdul Latif Jameel Poverty Action Lab (J-PAL). In her research, she seeks to understand the economic lives of the poor, with the aim of helping design and evaluate social policies. She has worked on health, education, financial inclusion, environment, and governance.

Duflo's first degrees were in history and economics from École Normale Supérieure, in Paris; she subsequently received a PhD from MIT. She has received numerous academic honors and prizes including the Princess of Asturias Award for Social Sciences, the A.SK Social Science Award, the Infosys Prize, the David N. Kershaw Award, a John Bates Clark Medal, and a MacArthur "genius" grant. With Abhijit Banerjee, Duflo wrote "Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty." She is also a founding editor of the *American Economic Journal: Applied Economics*.

Klavs Jensen

Jensen's research interests revolve around reaction and separation techniques for on-demand multistep synthesis, methods for automated synthesis, and microsystems biological discovery and manipulation. He also investigates catalysis, chemical kinetics, and transport phenomena, along with the development of simulation approaches for reactive chemical and biological systems.

Jensen received his PhD in chemical engineering from the University of Wisconsin at Madison. He is the recipient of several awards and prizes, including a National Science Foundation Presidential Young Investigator Award, a Camille and Henry Dreyfus Foundation Teacher-Scholar Grant, a Guggenheim Fellowship, and the inaugural IUPAC-ThalesNano Prize in Flow Chemistry. Jensen is a member of the U.S. National Academy of Engineering and the American Academy of Arts and Sciences, and he is a fellow of the American Association for the Advancement of Science, the American Institute of Chemical Engineers, and the Royal Society of Chemistry.

Nergis Mavalvala

Mavalvala is an astrophysicist working on the detection of gravitational waves and quantum measurement science. She is a longtime member of the scientific team that announced in 2016 the first direct detection of gravitational waves from colliding black holes by the Laser Interferometer Gravitational-wave Observatory (LIGO). In the quest for ever greater sensitivity in the LIGO detectors, Mavalvala has also conducted pioneering experiments on generation and application of squeezed states of light, and on laser cooling and trapping of macroscopic objects to enable observation of quantum phenomena in human-scale systems.

Mavalvala received a bachelor's degree from Wellesley College and a PhD from MIT. She was a postdoctoral fellow and research scientist at the California Institute of Technology before joining the physics faculty at MIT in 2002. She was appointed associate department head of physics in February 2015. Mavalvala is a 2010 recipient of a MacArthur "genius" grant.

Topics: Biology Health sciences and technology

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Institute for Medical Engineering and Science (IMES) Chemistry Economics

Chemical engineering Materials Science and Engineering Physics

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Awards, honors and fellowships

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