



ABOUT THE PROGRAM

Brandeis offers students the unique opportunity to prepare for graduate school or employment in a variety of technical fields. Undergraduate students have the opportunity to participate in cutting-edge research in areas and topics including astrophysics and cosmology, biological physics, condensed-matter physics, high-energy particle physics, theoretical physics, string theory, liquid crystals, DNA, polymers, elementary particles, distant quasars and the early universe. Students majoring in physics can work toward a bachelor of arts or bachelor of science degree; we also offer a physics minor.

What makes the program distinctive?

The Brandeis science departments combine world-class research and a first-rate liberal arts university. All physics students are strongly encouraged to get involved in research projects. These may involve observing distant quasars, analyzing data from the Large Hadron Collider,

working in our cutting-edge, condensed-matter laboratories, or carrying out theoretical studies ranging from biological materials to quantum theory. The close collaboration between faculty and students in research carries over into the classroom.

FAST FACTS

Current number of majors and minors: 32

Number of faculty: 19

Can you minor in this program? Yes

Emphasis within the major: student-faculty collaboration and close personal attention

Popular second majors: computer science, economics, math

Website: brandeis.edu/departments/physics

ACADEMICS AND RESEARCH

Combined physics and engineering degree

Brandeis University has established a dual-degree program whereby students complete three years of course work at Brandeis, followed by two years of study at Columbia University. Students are awarded a B.A. in physics from Brandeis and a B.S. in engineering from Columbia after successful completion of the program.

Undergraduate research

Nearly all our physics majors carry out research working one-on-one with faculty and graduate students in any of the areas previously described. This may be during the spring or fall terms or during the summers and usually leads to writing a senior thesis and obtaining an honors degree. These can be paid positions or research internships for academic credit.

Recent senior theses

Recent senior theses include “Thermal Fluctuations in the Edge of a Smectic Monolayer” by Daniel Beller '09, now a graduate student at the University of Pennsylvania; “Simulations of Virtual Graviton Exchange Processes in Large Extra Dimension Theories at the Large Hadron Collider” by Kathryn Marable '09, who interned at CERN in Switzerland; “Investigating Magnetic Field Structure in Superluminal Jets” by Michael Morse '09, now a graduate student at Brown University; and “Enhanced Optical Absorption of Pulsed-Laser-Melted + Ion-Implanted Silicon Supersaturated with Chalcogens” by Si H. Pan, now a staff member at MIT Lincoln Labs.

AWARDS AND RECOGNITION

Faculty grants and awards

Physics department faculty members have research grants from the National Science Foundation, the Department of Energy and the National Institutes of Health, among others. Three of the largest grants are a \$7.8-million, five-year award from the National Science Foundation for a materials science and engineering research center; a \$2.1-million, three-year grant from the Department of Energy for research at the Large Hadron Collider and for string theory; and a \$1-million, three-year award from the W.M. Keck Foundation for interdisciplinary research into “active matter.” All of these grants help support undergraduate research. Prizes won by

members of the physics department include the Heineman Prize to Professor Stanley Deser (who is also a member of the National Academy of Sciences) and the Benjamin Franklin Medal to Professor Robert Meyer.

Student publications

Since 2008, seven undergraduate physics students have been co-authors on papers published in professional journals including *Astrophysical Journal*, *Soft Matter* and the *Journal of Instrumentation*.

BEYOND THE CLASSROOM

Student-run clubs

The Physics Club is open to all undergraduates and meets regularly. Its activities include special lectures, outside trips, tutoring, outreach to local schools and special creative projects.

Internship opportunities

Many students participate in summer research experiences for undergraduates funded by the National Science Foundation at institutions across the United States.

AFTER BRANDEIS

Diverse career fields

The majority of our physics majors go on to graduate school, often enrolling in Ph.D. programs in physics, applied physics, biological physics, biotechnology, astrophysics, materials science and engineering. However, recent graduates also have worked in the nanotechnology industry, in energy sustainability, at the Boston Shakespeare Company, at the Nature Conservancy and at the Bureau of Diplomatic Security with the state department.

Notable alumni

Brandeis physics graduates include Dan Prober '70, professor of applied physics at Yale University; Lois Pollock '83, associate professor of applied and engineering physics at Cornell University; Olaf Olafsson '83, a novelist and the executive vice president of Time Warner; Dan Needleman '98, assistant professor of applied physics and of molecular and cellular biology at Harvard University and Harvard Medical School; and Matthew Roberts '05, Simons Foundation Fellow in theoretical physics at New York University.

