



## 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:** 50

**Number of faculty:** 16

**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](http://brandeis.edu/departments/physics)

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## 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 BA in physics from Brandeis and a BS 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 “Survey of High-Redshift Quasars using the Jansky VLA” by Jose Vargas '15, now teaching physics through Teacher For America; “A New Approach to Solving the Hermitian Yang-Mills Equations” by Netta Engelhardt '11, now a graduate student at University of California, Santa Barbara; and “Thermal Fluctuations in the Edge of a Smectic Monolayer” by Daniel Beller '09, now a postdoctoral fellow in applied mathematics at Harvard University's School of Engineering and Applied Sciences.

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## 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. For example, faculty recently received a \$12 million award from the National Science Foundation for a materials and engineering research center that studies biomaterials, one of only twenty-four such centers in the country, and a \$2.1 million grant from the Department of Energy for research at the Large Hadron Collider at CERN in Switzerland, putting Brandeis scientists at the forefront of studies of the fundamental constituents of matter. We are

also part of a \$10 million multi-institution grant from the Simons Foundation for research at the interface of quantum information theory, quantum field theory and quantum gravity. And we are the only physics department in the country that has a \$1 million grant from the Howard Hughes Foundation to advance undergraduate research. Members of the physics department have won numerous prizes. Among these, Professor Stanley Deser (also a member of the National Academy of Sciences) received the Heineman Prize, and Professor Robert Meyer received the Benjamin Franklin Medal.

### Student publications

Since 2004, 25 of our undergraduate physics students have been co-authors on papers published in professional journals, including *Astrophysical Journal*, *Soft Matter*, *Physical Review* and the *Journal of Instrumentation*.

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## 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. Students may also join the Astronomy Club.

### Internship opportunities

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

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## AFTER BRANDEIS

### Diverse career fields

The majority of our physics majors go on to graduate school, often enrolling in PhD 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. See the Physics Blog ([blogs.brandeis.edu/physics/alumni-](http://blogs.brandeis.edu/physics/alumni-)

[news/where-do-our-physics-majors-go](#)) for a more complete listing of our recent alumni.

### Notable alumni

Brandeis physics graduates include Dan Prober '70, professor of applied physics at Yale University; Lois Pollock '83, professor and director of applied and engineering physics at Cornell University; Olaf Olafsson '83, a novelist and the executive vice president of Time Warner; Daniel Needleman '98, associate professor of applied physics and of molecular and cellular biology at Harvard University and Harvard Medical School; Matthew Roberts '05, Kadanoff Center Fellow at the Kadanoff Center for Theoretical Physics at the University of Chicago; Elana Klein '03, assistant professor of oncology at Johns Hopkins University; Zvonimir Dovic '95, associate professor at Brandeis; and Michael Robinson '95, senior patent counsel at Agenus Inc.

