STANFORD UNIVERSITY
DEPARTMENT OF PHYSICS
Stanford, California 94305
http://physics.stanford.edu

General University Information
President: Marc Tessier-Lavigne
Dean of Graduate School: Richard Saller
University website: http://www.stanford.edu
Control: Private
Setting: Suburban
Total Faculty: 1,615
Total Graduate Faculty: 421
Total number of Students: 16,770
Total number of Graduate Students: 9,771

Department Information
Department Chairman: Prof. Peter Michelson, Chair
Department Contact: Maria Frank, Student Services Officer
Total full-time faculty: 48
Total number of full-time equivalent positions: 48
First-Year Graduate Students: 31
Female First-Year Students: 5
Total Post Doctorates: 67

Department Address
382 Via Pueblo Mall
Stanford, CA 94305
Phone: (650) 723-4344
E-mail: phys-admissions@lists.stanford.edu
Website: http://physics.stanford.edu

ADMISSIONS

Admission Contact Information
Address admission inquiries to: Before calling or emailing Graduate Admissions, please look for answers to your questions on the Applying to Graduate Admissions page http://studentaffairs.stanford.edu/gradadmissions/applying, and the Frequently Asked Questions page https://gradadmissions.stanford.edu/applying/frequently-asked-questions
Phone: (866) 432-7472
E-mail: gradadmissions@stanford.edu
Admissions website: http://gradadmissions.stanford.edu

Application deadlines
Fall admission: U.S. students: December 13 Int’l. students: December 13

Application fee
U.S. students: $125 Int’l. students: $125
Application Fee Waiver Information: https://graddiversity.stanford.edu/graduate-fee-waivers

Admissions information
For Fall of 2016:
Number of applicants: 719
Number admitted: 78
Number enrolled: 36

Admission requirements
Bachelor’s degree requirements: Bachelor’s degree in Physics (or a related field) is required.

GRE requirements
The GRE is required. No minimum scores specified. We strongly advise you to take the general and physics GRE tests no later than September, so that your scores will be received by the application deadline or shortly thereafter.

Advanced GRE requirements
The Advanced GRE is required. No minimum scores specified. We strongly advise you to take the general and physics GRE tests no later than September, so that your scores will be received by the application deadline or shortly thereafter.

TOEFL requirements
The TOEFL exam is required for students from non-English-speaking countries.
PBT score: 600
iBT score: 100
Adequate command of spoken and written English is required for admission. Applicants whose first language is not English must submit an official test score from the Test of English as a Foreign Language (TOEFL). Scores must be submitted from a test taken within the last 18 months. Exceptions are granted for applicants who have earned a U.S. bachelor’s or master’s degree from a college or university accredited by a regional accrediting association in the United States, or equivalent of either degree from a university of recognized standing in countries where all instruction is provided in English. For example, applicants with degrees from Australia, Canada (except Quebec), New Zealand, Singapore, the United Kingdom (England, Scotland, Ireland, and Wales) are exempt from taking the TOEFL. Applicants with degrees from countries where English is spoken but not all courses provided in English are not exempt from taking the TOEFL. U.S. citizenship does not automatically exempt an applicant from taking the TOEFL; if the applicant’s first language is not English.

Other admissions information
Additional requirements: No minimum scores specified.
The average GRE scores for admitted students in 2016–17 were: Verbal-163, Quantitative–168; Analytical–4.56; Physics Subject–920.

TUITION
Tuition year 2016–17: Full-time students: $41,040 annual
Further Info: https://registrar.stanford.edu/students/tuition-and-fees
Credit hours per semester to be considered full-time: 10
Deferred tuition plan:
Health insurance: Available at the cost of $4,968 per year.
Other academic fees: Varies (student health insurance is required). Health insurance subsidy available for qualifying students. See https://vaden.stanford.edu/insurance/cardinal-care/cost-coverage for more information.
Academic term: Quarter
Number of first-year students who received full tuition waivers: 36

FINANCIAL AID

Loans
Loans are available for U.S. students. Loans are not available for international students.
GAPSFAS application required: No
**FACULTY**

**Professor**


Buckbaum, Philip, Ph.D., University of California, Berkeley, 1980. Director, Ultrafast Science Center, SLAC National Accelerator Laboratory. Atomic, Molecular, & Optical Physics. Optics; atomic, molecular, and optical physics.


Chu, Steven, Ph.D., University of California, Berkeley, 1976. Professor Physics and Molecular and Cellular Physiology. Atomic, Molecular, & Optical Physics, Biophysics. Atomic, molecular, and optical physics.


Drell, Persis, Ph.D., University of California, Berkeley, 1983. Professor of Physics and Material Science & Engineering; Dean of the School of Engineering. Astrophysics, Particles and Fields. Experimental and observational astrophysics and cosmology; experimental particle physics.


Kallosh, Renata, Ph.D., Lebedev Physical Institute, Moscow, 1968. Theoretical Physics. Theoretical particle physics.


Levin, Craig, Ph.D., Yale University, 1993. Prof. of Radiology and by courtesy, Physics, Electrical Engineering and Bioengineering. *Biophysics.* Molecular Imaging Instrumentation.


Michelson, Peter, Ph.D., Stanford University, 1979, Department Chair. *Astrophysics.* Experimental and observational astrophysics and cosmology.


Wieman, Carl, Ph.D., Stanford University, 1977. *Atomic, Molecular, & Optical Physics, Physics and other Science Education.* Physics education and atomic and molecular physics.

Zare, Richard N., Ph.D., Harvard University, 1964. Professor of Chemistry and by courtesy, Physics. *Other, Laser Chemistry.*


**Assistant Professor**

Das, Riju, Ph.D., Stanford University, 2005. Assistant Professor of Biochemistry and, by courtesy, Physics. *Biophysics.*


**Professor Emeritus**


Schwettman, H. Alan, Ph.D., Rice University, 1962. *Atomic, Molecular, & Optical Physics, Low Temperature Physics.* Atomic, Molecular and Optical Physics.


Sturrock, Peter, Ph.D., University of Cambridge, 1951. Professor (Emeritus) by Courtesy. *Astrophysics, Solar Physics, Theoretical Physics.* Theoretical Astrophysics and Cosmology.


Walecka, John D., Ph.D., Massachusetts Institute of Technology, 1958. *Nuclear Physics, Particles and Fields, Theoretical Physics.* Theoretical Nuclear and Particle Physics.


California

Research Professor

Hollberg, Leo, Ph.D., University of Colorado Boulder, 1984. Atomic, Molecular, & Optical Physics. Atomic, Molecular, and Optical Physics.


Courtesy Professor

Akerib, Daniel S., Ph.D., Princeton University, 1991. Professor, SLAC National Accelerator Laboratory. Astrophysics. CDMS.


DEPARTMENTAL RESEARCH SPECIALTIES AND STAFF

Theoretical

Quantum Information, Hayden.

Theoretical Astrophysics and Cosmology. Calculating and modeling the physics of the cosmos. First objects in the universe, relativistic astrophysics, neutron stars, black holes, inflation, cosmic evolution and structure. Current research in theoretical astrophysics and cosmology at Stanford explores a wide range of critical questions. Major topics include numerical simulations of the formation of structure from small scales (first stars) to large scales (dark matter structure), galaxy formation, black holes (evolution, jets, accretion disks and orbiting objects), neutron stars (pulsars, magnetars), particle acceleration (relativistic shocks, origin of cosmic rays), gravitational lensing, and the very early universe (inflation). For more info: https://physics.stanford.edu/research/theoretical-astrophysics-and-cosmology Abel, Blandford, Petrosian, Romani, Wechsler

Theoretical Condensed Matter. Predicting the behavior of material systems based on their structure and composition. Exotic phases of matter, emergent phenomena, origin of physical law, topological phenomena. Theoretical condensed matter physics at Stanford is focused on understanding the macroscopic and collective properties of condensed matter systems. What is the relation between the macroscopic properties and the microscopic physics at the single electron or single molecule scale? In particular what are the consequences of strong correlation effects in electronic materials and devices where the low energy properties are qualitatively different from those of a noninteracting electron gas? How do new phases of matter fit into field theories that describe the collective behavior of electrons in solids and how can these be detected in experiments? Central areas of research include quantum entanglement, the quantum spin Hall effect, topological insulators, quantum spintronics, cuprate and pnictide superconductors, superfluidity, and holographic duality. For more info: https://physics.stanford.edu/research/theoretical-condensed-matter-physics Doniach, Kivelson, Laughlin, Qi, Raghu, Zhang

Theoretical Particle Physics. Understanding the fundamental nature of forces, particles, and space-time geometry. The origin of mass, grand unification of the forces, general relativity, quantum field theory and string theory and their applications, early universe cosmology including inflation and eternal inflation, holography, quantum gravity. Research in the Stanford Institute for Theoretical Physics (SITP) includes a strong focus on fundamental questions about the new physics underlying the Standard Models of particle physics and cosmology, and on the nature and applications of our basic frameworks (quantum field theory and string theory) for attacking these questions. For more info: https://physics.stanford.edu/research/theoretical-particle-physics Dimopoulos, Graham, Hartnoll, Kachru, Kallosh, Linde, Senatore, Shenker, Silverstein, Susskind.

Experimental


Experimental and Observational Astrophysics and Cosmology. Viewing the formation and evolution of stars, galaxies, and the cosmos. Galaxy clusters, cosmic microwave background radiation, ultra high-energy sources, large scale structure in the universe and cosmic evolution. Current research in observational astrophysics and cosmology at Stanford covers a wide range of approaches to tackling the most important frontiers. Major topics include direct detection of dark matter, probes of dark energy (via gravitational lensing, surveys of galaxy clusters and supernovae), sources of gamma rays (pulsars, blazars, supernova remnants, dark matter annihilation or decay), the structure of clusters of galaxies and their use as probes of cosmology, the development of next generation detectors of photons (radio through gamma-ray), the origins of solar variability on a wide range of time scales, and experiments in gravitation (detection of gravitational waves, probes of gravity at short distance scales). For further info: https://physics.stanford.edu/research/experimental-observational-astrophysics-and-cosmology Allen, Burchat, Cabrera, Church, Drell, Irwin, Kohn, Kuo, Macintosh, Michelson, Scherrer.

Experimental Condensed Matter Physics. Measuring the behavior of electrons in material systems. Semiconductor nanostructures, superconductivity and low-temperature physics, atomic and molecular measurement and control, novel quantum materials. News: Stanford researchers create exotic electrons that may lead to new materials, devices Research in experimental condensed matter physics at Stanford takes place in the Physics and Applied Physics Departments and has strong connections with the Photon Science Department at the SLAC National Accelerator Laboratory. A broad set of topics are explored in the Varian Physics Laboratory, Geballe Laboratory for Advanced Materials and through the Stanford Institute for Materials and Energy Science. For more info: https://physics.stanford.edu/research/experimental-condensed-matter-physics Goldhaber-Gordon, Kapitulnik, Manoharan, Moler, Shen.

Experimental Particle Physics. Understanding the fundamental forces and particles of the universe. Electroweak symmetry breaking, heavy flavor physics, searches for physics beyond the Standard Model, matter/antimatter asymmetry, dark matter, single-photon detection, neutrino properties, dark energy, instrumentation and detector development. At Stanford, studies of the fundamental interactions and the elementary particles are enhanced by close collaboration between the Physics Department and the SLAC National Accelerator Center. The Cryogenic Dark Matter Search (CDMS) and the LUX-
ZEPLIN Experiment (LZ) focus on the development and operation of new detector technologies to increase the sensitivity of searches for weakly interacting massive particles. The goal of the Enriched Xenon Experiment (EXO) is to detect “neutrinoless double-beta decay” using large amounts of xenon enriched in the isotope 136. The MINOS Experiment is a long-baseline neutrino experiment designed to observe the phenomenon of neutrino oscillations, an effect that is related to neutrino mass. The BABAR data set provides opportunities for studying matter/antimatter asymmetries (CP violation) and heavy flavor physics. SLAC plays a major role on the ATLAS experiment at the Large Hadron Collider, focusing on the pixel detector, the high-level trigger system, detector simulations and the exploration of TeV-scale physics. For more info: https://physics.stanford.edu/research/experimental-particle-physics Gratta, Hogan, Tompkins. Physics and Science Education Research. Wieman.