UNIVERSITY OF DELAWARE
DEPARTMENT OF PHYSICS AND ASTRONOMY
Newark, Delaware 19716
http://web.physics.udel.edu

General University Information
President: Dennis Assanis
Dean of Graduate School: Doug Doren (Interim Vice Provost)
University website: http://www.udel.edu
School Type: Public
Setting: Suburban
Total Faculty: 1,277
Total number of Students: 27,774
Total number of Graduate Students: 4,024

Department Information
Department Chair: Prof. Edmund Nowak, Chair
Department Contact: Elle Bornemann, Academic Support Coordinator
Total full-time faculty: 37
Total number of full-time equivalent positions: 35
Full-Time Graduate Students: 74
Female Full-Time Graduate Students: 8
First-Year Graduate Students: 11
Female First-Year Students: 2
Total Post Doctorates: 12

Department Address
104 The Green/ 217 Sharp Lab
Newark, DE 19716
Phone: (302) 831-1995
Fax: (302) 831-1637
E-mail: physics@physics.udel.edu
Website: http://web.physics.udel.edu

ADMISSIONS

Admission Contact Information
Address admission inquiries to: Chair of Graduate Admissions Committee
Phone: (302) 831-1995
E-mail: physics@physics.udel.edu
Admissions website: http://web.physics.udel.edu/graduate/apply

Application deadlines
Fall admission:
U.S. students: April 15
Int'l. students: April 15

Application fee
U.S. students: $75
Int'l. students: $75
Application fees are deferred, until notice of acceptance has been granted by the committee. If accepted into the program, the application fee is required. If admission is not granted, the application fee is waived.

Admissions information
For Fall of 2019:
Number of applicants: 160
Number admitted: 34
Number enrolled: 11

Admission requirements
Bachelor’s degree requirements: Admission to either the M.S. or Ph.D. program requires a Bachelor’s degree in Physics or a closely related field.
Minimum undergraduate GPA: 3.2

GRE requirements
The GRE is required.
Minimum accepted GRE scores:
Quantitative score: 160
Mean GRE score range (25th–75th percentile): 313-326
GRE scores are on new scale.

GRE Physics requirements
The GRE Physics is required.
Minimum accepted GRE Physics score: 650
Mean GRE Physics score range (25th–75th percentile): 670-850

TOEFL requirements
The TOEFL exam is required for students from non-English-speaking countries.
Minimum accepted TOEFL scores:
PBT score: 600
iBT score: 100
IELTS score of 7.0 is acceptable in place of TOEFL.

Other admissions information
Additional requirements: Advanced GRE score expected for financial aid consideration.
Undergraduate preparation assumed: Electricity and Magnetism, Classical Mechanics, Quantum Mechanics, Thermodynamics.

TUITION AND ASSISTANTSHIPS

Teaching Assistants, Research Assistants, and Fellowships
Number of first-year
Teaching Assistants: 11
Average stipend per academic year
Teaching Assistant: $28,000
Research Assistant: $27,000

Tuition year 2019–20:
Tuition for in-state residents
Full-time students: $16,443 per semester
Part-time students: $1,827 per credit
Tuition for out-of-state residents
Full-time students: $16,443 per semester
Part-time students: $1,827 per credit
Teaching and Research Assistant tuition is waived.
Credit hours per semester to be considered full-time: 6
Deferred tuition plan: Yes
Health insurance: Available at the cost of $200 per year.
Other academic fees: $454 (Health Service) per year.
Academic term: Semester
Number of first-year students who received full tuition waivers: 11

FINANCIAL AID

Application deadlines
Fall admission:
U.S. students: January 31
Int'l. students: January 31

Loans
Loans are not available for U.S. students.
Loans are not available for international students.
GAPSFAS application required: No
FAFSA application required: No
SPECIAL EQUIPMENT, FACILITIES, OR PROGRAMS

GRADUATE DEGREE REQUIREMENTS

Master’s: Twenty-four credit hours of classroom courses plus six credits of M.S. thesis. Thirty credit hours for M.S. without thesis.

Doctorate: Thirty credit hours of classroom courses, passing the Ph.D. written and oral candidacy exam, Ph.D. thesis. Students entering the program with a Master’s degree may follow the Ph.D. fast track which has a reduced course requirement of 12 credit hours.

Thesis: Thesis may be written in absentia.

SPECIAL EQUIPMENT, FACILITIES, OR PROGRAMS

The Department of Physics and Astronomy is housed in Sharp Laboratory, which has its own library, machine and electronics shops, as well as research and teaching laboratories, classrooms, and office space. The condensed matter and material science programs have in house scanning and transmission microscopes, a variety of magnetometers, X-ray diffractometers, differential scanning calorimeters, thin-film deposition systems and cryogenic facilities, and make use of accelerator based facilities for X-ray and neutron scattering. The atomic and molecular physics laboratories include femtosecond and high-power pulsed lasers for non-linear optical studies and high resolution multiphoton spectroscopy. The astro-particle physics programs include high-altitude balloon flights and high-energy cosmic ray and neutrino experiments in Antarctica (IceCube and ANITA). Space physics programs maintain a world-wide network of neutron monitors and are involved with MMS, the Magnetosphere Multiscale mission, and multispacecraft missions such as Cluster-2; to study the magnetosphere and the solar wind. Opportunities are available for participation in several NASA missions: ACE, The Spitzer infrared telescope, the Chandra X-ray satellite and the Hubble Space Telescope. UD is the lead institution for the Whole Earth Telescope (WET). Further programs on campus are the Institute for Energy Conversion and the Center for Composite Materials.
Mass Stars and Brown Dwarfs; Calibration of Spitzer Space Telescope.


MacDonald, James, Ph.D., University of Cambridge, 1979. *Astrophysics*. Pre-supernova evolution of intermediate mass population III stars; Effects of rotation and magnetic fields on the structure and evolution of stars; Wolf-Rayet star pulsations.


Mullan, Dermott J., Ph.D., University of Maryland, 1969. *Astrophysics*. Effects of magnetic fields in the Sun and stars.


Owocki, Stanley P., Ph.D., University of Colorado, 1982. *Astrophysics*. Theoretical Stellar Astrophysics; Radiatively driven stellar mass loss; Computational Magnetohydrodynamics.

Safronova, Marianna, Ph.D., University of Notre Dame, 2001. *Atomic, Molecular, & Optical Physics*. Studies of fundamental symmetries Modeling of trapped atoms for atomic clocks and quantum information Development of new relativistic high-precision methodologies for atomic calculations; Calculation of atomic properties for various applications.

Seckel, David, Ph.D., University of Washington, 1983. *Particles and Fields*. Cosmic rays; Neutrinos: cosmological and astrophysical; IceCube and IceTop Neutrino Observatory; ANITA detector for high energy neutrinos created by collisions between cosmic rays and the the cosmic microwave photons.


Shah, Ismat, Ph.D., University of Illinois, 1986. *Condensed Matter Physics*. Inert gas condensation; Metallorganic chemical vapor deposition of oxides; Nanoparticles by sol-gel; Enertgetic condensation for the deposition of polycrystalline silicon films on low temperature substrates; Development of sputtering sources for unique applications Dilute magnetic semiconductor; Magnetic nanoparticles; Quantum dot solar cell.


Stanev, Todor, Ph.D., Sofia, Bulgaria, 1977. *Particles and Fields*. IceCube and IceTop neutrino observatory; Cosmic rays.

Szalewicz, Krzysztof, Ph.D., University of Warsaw, 1977. *Atomic, Molecular, & Optical Physics*. Theory of intermolecular interactions; Development of methods for computations of intermolecular force fields; Calculations of force fields from first principles; Many-body/coupled cluster theories of electron correlation; Vibronial spectra of clusters Molecular simulations of liquids and solids Predictions of structure of molecular crystals Theory of exotic (containing muons, antiprotons, etc) molecules.


Walker, Barry, Ph.D., Stony Brook University, 1996. *Atomic, Molecular, & Optical Physics*. Ultrafast opto-electronic technology; Atoms in “ultra” high intensity laser fields; Atoms and molecules in perturbative “multiphoton” and nonperturbative “strong” optical fields.

Watson, George, Ph.D., University of Delaware, 1984. *Condensed Matter Physics*. Photonic band structure measurements; Continuous wave and picosecond laser; spectroscopy; Science education reform; Problem-based learning.

Xiao, John Q., Ph.D., Johns Hopkins University, 1993. *Condensed Matter Physics*. Spin-polarized transport and high frequency dynamics in spintronic devices; Magnetism in various types of structures; High frequency soft magnetic materials; Metamaterials including magnetodielectric materials and artificial band-gap materials; Synthesis, characterization, and applications of nanostructured materials.

Associate Professor

Clem, John, Ph.D., Vanderbilt, 1990. *Atmosphere, Space Physics, Cosmic Rays*. ANITA detector for high energy neutrinos created by collisions between cosmic rays and the the cosmic microwave photons; IceCube and IceTop Neutrino Observatory; Measurements on High Altitude Balloons and Particle Detector Development; Geomagnetic and Heliospheric Magnetic Fields; Cosmic Rays and Neutrinos Solar Energetic Particles.


Assistant Professor

reactions at interfaces; Charge carrier dynamics in nanomaterials.


Lyman, Edward, Ph.D., Virginia Polytechnic Institute and State University (Virginia Tech), 2004. Biophysics. Computational biological physics; Algorithm architectures for biomolecular simulation; Membrane biophysics.


Schroeder, Frank G., Ph.D., Karlsruhe Institute of Technology. Particles and Fields. High-energy cosmic particles (nuclei, photons, neutrinos); detectors for cosmic-ray air showers; techniques for tie and amplitude calibration.

DEPARTMENTAL RESEARCH SPECIALTIES AND STAFF

Theoretical

Astrophysics. Dodson-Robinson, Gizis, MacDonald, Matthaeus, Mullan, Owocki, Petit, Shay, Shipman.

Atmosphere, Space Physics, Cosmic Rays. Clem, Evenson, Gaisser, Maruca, Matthaeus, Seckel, Shay, Stanev.

Atomic, Molecular, & Optical Physics. Gundlach, Lyman, Morgan, Safronova, Szalewicz, Walker.

Biophysics. Lyman.

Condensed Matter Physics. Chui, Nikolic, Nowak, Unruh.

Particles and Fields. Barr, Gaisser, Holder, Seckel, Shafi, Stanev.

Experimental

Astrophysics. Gizis, Holder, Petit, Provencal, Shipman.

Atmosphere, Space Physics, Cosmic Rays. Evenson, Gaisser, Holder, Maruca, Schroeder.

Atomic, Molecular, & Optical Physics. DeCamp, Gundlach, Walker.


Particles and Fields. Schroeder.

View additional information about this department at www.gradschoolshopper.com. Check out the “Why Choose Us?” section, find out more about the department’s culture and get links to social media networks.