

UNIVERSITY OF VERMONT

DEPARTMENT OF PHYSICS

Burlington, Vermont 05405-0125

<http://www.uvm.edu/physics>

General University Information

President: E. Thomas Sullivan
Dean of Graduate School: Cynthia Forehand, Ph.D.
University website: <http://www.uvm.edu>
School Type: Public
Setting: Urban
Total Faculty: 1,600
Total Graduate Faculty: 643
Total number of Students: 13,340
Total number of Graduate Students: 1,517

Department Information

Department Chairman: Prof. Jun-Ru Wu, Chair
Department Contact: Denise M. Fontaine, Department Administrative Coordinator
Total full-time faculty: 13
Total number of full-time equivalent positions: 14
Full-Time Graduate Students: 15
Female Full-Time Graduate Students: 4
First-Year Graduate Students: 3
Female First-Year Students: 1
Total Post Doctorates: 2

Department Address

82 University Place
STEM Discovery Hall, RM W203
Burlington, VT 05405-0125
Phone: (802) 656-2664
Fax: (802) 656-0817
E-mail: physics@uvm.edu
Website: <http://www.uvm.edu/physics>

ADMISSIONS

Admission Contact Information

Address admission inquiries to: Department of Physics, University of Vermont, STEM Discovery Hall, W203, 82 University Place, Burlington, VT 05405-0125
Phone: (802) 656-2644
E-mail: physics@uvm.edu
Admissions website: <http://www.uvm.edu/~gradcoll/?Page=Admissions.html&SM=Prospectivemenu.html>

Application deadlines

Fall admission:
U.S. students: March 1 *Int'l. students:* March 1
Spring admission:
U.S. students: November 15 *Int'l. students:* November 15

Application fee

U.S. students: \$65 *Int'l. students:* \$65
Online

Admissions information

For Fall of 2018:
Number of applicants: 29
Number admitted: 11
Number enrolled: 5

Admission requirements

Bachelor's degree requirements: Bachelor's degree in Physics is required.
Minimum undergraduate GPA: 3.0

GRE requirements

The GRE is required.
The GRE is required. The minimum acceptable score suggested for admission is not specified. The minimum acceptable score for admission is dependent upon the applicant's overall record.

Subjective GRE requirements

The Subjective GRE is not required.
The GRE Physics is not required.

TOEFL requirements

The TOEFL exam is required for students from non-English-speaking countries.
PBT score: 577
iBT score: 90

For student funded, an internet-based score of 100 is required, and a paper-based score of 600 is required.

Other admissions information

Additional requirements: The General GRE cannot be waived. The Advanced GRE can be waived in special cases. No minimum acceptable score is specified. The average GRE internet-based scores for 2017–2018 admissions were as follows: verbal, 153.0; quantitative, 159.0; analytical writing, 3.5.
Undergraduate preparation assumed: Taylor, Classical Mechanics; Griffiths, Introduction to Electrodynamics; Kittel and Kroemer, Thermal Physics; Griffiths, Introduction to Quantum Mechanics.

TUITION

Tuition year 2017–18:
Tuition for in-state residents
Full-time students: \$664 per credit
Tuition for out-of-state residents
Full-time students: \$1,674 per credit
Credit hours per semester to be considered full-time: 10
Deferred tuition plan: No
Health insurance: Available at the cost of \$1,347 per year.
Other academic fees: \$10 comp fees per credit. \$7 graduate student senate fee
Academic term: Semester

Teaching Assistants, Research Assistants, and Fellowships

Number of first-year
Teaching Assistants: 1
Teaching Assistant: \$16,125 (M.S.) \$19,950 (Ph.D, MATS)
Research Assistant: \$16,125 (M.S.) \$19,950 (Ph.D, MATS)

FINANCIAL AID

Application deadlines

Fall admission:
U.S. students: March 1 *Int'l. students:* March 1
Spring admission:
U.S. students: November 15 *Int'l. students:* November 15

Loans

Loans are available for U.S. students.
Loans are available for international students.
GAPSFAS application required: No
FAFSA application required: Yes

For further information

Address financial aid inquiries to: Student Financial Services, 223 Waterman Building, 85 South Prospect Street, Burlington, VT 05405.
 Phone: (802) 656-5700
 E-mail: sfs@uvm.edu
 Financial aid website: <http://www.uvm.edu/~stdfins/>

HOUSING

Availability of on-campus housing

Single students: Yes
 Married students: Yes

For further information

Address housing inquiries to: Office of Family Housing, Fort Ethan Allen, 36 Catamount Lane, Colchester, VT 05446.
 Phone: (802) 656-3434
 E-mail: reslife@uvm.edu
 Housing aid website: https://reslife.uvm.edu/content/apartments_and_family_housing/contact_afh

Table A—Faculty, Enrollments, and Degrees Granted

Research Specialty	2017-18 Faculty	Enrollment Fall 2017		Number of Degrees Granted 2017-18 (2007-17)		
		Mas-ter's	Doc-torate	Mas-ter's	Terminal Master's	Doc-torate
Acoustics	1	-	-	-	-(2)	-
Astronomy	3	-	-	-(2)	-	-
Astrophysics	-	1	-	-	-	-
Biophysics	2	-	-	-(2)	-(5)	-
Condensed Matter Physics	8	1	-	1(2)	-(12)	-
History & Philosophy of Physics/Science	-	-	-	-	-(2)	-
Low Temperature Physics	-	-	-	-	-	-
Materials Science, Metallurgy	-	-	13	-	-(2)	2(14)
Optics	-	-	-	-	-	-
Polymer Physics/Science	-	-	-	-	-	-
Total	14	2	13	1(6)	-(23)	-(14)
Full-time Grad. Stud.	-	2	13	-	-	-
First-year Grad. Stud.	-	1	2	-	-	-

GRADUATE DEGREE REQUIREMENTS

Master's: A minimum of 30 semester hours of graduate credit is required. Of the 30 hours, 21 must be completed in residence. At least six must be in thesis research and nine in other courses numbered above 300 (graduate students only). No more than 15 hours of thesis research may be included in the degree program. The candidate must pass a written and oral comprehensive examination, as well as an oral examination on the thesis. The graduate student must maintain a B average. There are no foreign language requirements.

Doctorate: For Ph.D. in Physics: a minimum of 75 credits, including 6 core graduate courses completed with a grade B or better. All of these courses must be completed with a grade B or better within the first two years of graduate study. To accommodate the needs of the specific subfields in physics such as astrophysics, biological physics, condensed-matter physics and materials physics, three elective courses (nine credits) have to be chosen to fulfill the breadth requirement with a grade of B or higher. Elective courses must be com-

pleted within the first three years of the program, as the fourth year (and beyond if needed) should be dedicated to progress towards the Ph.D. dissertation. In addition, at least 20 credits of Doctoral Dissertation Research is required for Ph.D. students engaged in dissertation research, and at least 3 credits of Teaching College Physics is required. At the start of their second semester at UVM, students are expected to sit for the written part of the Comprehensive Exam which covers classical mechanics, quantum mechanics, electricity and magnetism, as well as thermal physics and mathematical physics. Students are given two opportunities to pass the comprehensive exam. In addition to the written portion, there is also an oral portion that consists of a Ph.D. dissertation proposal given after the start of a dissertation research project.

Other Degrees: For the Materials Science Program, Master's of Science and the Doctor of Philosophy degrees are offered in this interdisciplinary program. The faculty are drawn from the departments of Chemistry, Electrical Engineering, Mechanical Engineering, and Physics. The program is committed to educating the students in the application of basic sciences and engineering to promote understanding of the properties of materials, their development and applications, and to perform advanced and stimulating research in these areas. (The research program pursued in Materials Science at the University of Vermont has two areas of specialization: Electronic Materials and Bio/Polymeric Materials.) Each student must meet the general requirements or admissions as described at <http://www.uvm.edu/matsci>. Students in the program are sponsored by the participating department that best reflects the student's background and interest. The degree of Doctor of Philosophy requires a minimum of 75 credit hours earned in courses and in dissertation research of which a minimum of 51 hours must be earned in residence.

Thesis: Thesis may be written in absentia.

SPECIAL EQUIPMENT, FACILITIES, OR PROGRAMS

Research is concentrated in areas of astrophysics, biological physics, polymer physics, materials science, and condensed matter physics. Collaboration is feasible with other departments of science, engineering, and medicine on this geographically small campus. There is especially close cooperation with the School of Engineering, the College of Medicine, and the Department of Chemistry. The department shares a building with the Department of Chemistry.

Table B—Separately Budgeted Research Expenditures by Source of Support

Source of Support	Departmental Research	Physics-related Research Outside Department
Federal government	\$1,511,409	
State/local government		
Non-profit organizations		
Business and industry	\$104,631	
Other		
Total	\$1,616,040	

Table C—Separately Budgeted Research Expenditures by Research Specialty

Research Specialty	No. of Grants	Expenditures (\$)
Condensed Matter Physics	1	\$1,616,040
Total	1	\$1,616,040

FACULTY**Professor**

Clougherty, Dennis P., Ph.D., Massachusetts Institute of Technology, 1989. *Atomic, Molecular, & Optical Physics, Condensed Matter Physics, Theoretical Physics*. Theoretical condensed matter physics.

Headrick, Randall, Ph.D., University of Pennsylvania, 1988. Interim Chair. *Condensed Matter Physics, Nano Science and Technology*. Materials science. Molecular beam epitaxy; X-ray scattering surface processing.

Rankin, Joanna M., Ph.D., University of Iowa, 1970. *Astronomy, Astrophysics*. Radio astrophysics; history of science.

Wu, Jun-Ru, Ph.D., University of California, Los Angeles, 1985. Chair. *Acoustics, Biophysics, Condensed Matter Physics, Medical, Health Physics*. Experimental condensed matter physics and ultrasound.

Associate Professor

Del Maestro, Adrian, Ph.D., Harvard University, 2008. *Computational Physics, Condensed Matter Physics*. Theoretical condensed matter physics.

Furis, Madalina, Ph.D., State University of New York at Buffalo, 2004. *Condensed Matter Physics, Nano Science and Technology, Optics*. Materials science; ultrafast spectroscopy, time-resolved photoluminescence.

Kotov, Valeri, Ph.D., Clarkson University, 1996. *Condensed Matter Physics, Theoretical Physics*. Theoretical condensed matter physics.

Yang, Jie, Ph.D., Princeton University, 1987. *Biophysics*. Experimental biophysics; atomic force microscopy.

Assistant Professor

Vanegas, Juan, Ph.D., University of California, 2011. *Biophysics*. Biophysics.

White, Matthew S., Ph.D., University of Colorado, Boulder, 2009. *Applied Physics, Nano Science and Technology*. Experimental condensed/materials physics.

Emeritus

Arns, Robert G., Ph.D., University of Michigan, 1960. *History & Philosophy of Physics/Science, Nuclear Physics*. History of science.

Smith, David Y., Ph.D., University of Rochester, 1962. *Condensed Matter Physics, Optics*. Optical and X-ray properties of matter.

Spartalian, Kevork, Ph.D., Carnegie Mellon University, 1974. *Biophysics, Physics and other Science Education*. Mössbauer spectroscopy; biological physics; physics education.

Adjunct Professor

Ohanian, Hans C., Ph.D., Princeton University, 1968. *Relativity & Gravitation*. Relativity.

Senior Lecturer

Pepe, Jason, M.S., University of Vermont, 2003. Physics education.

Sanders, Malcolm, Ph.D., Yale University, 1984. *Nonlinear Dynamics and Complex Systems*. Applied physics; nonlinear systems; chaos.

Lecturer

Perry, John, Ph.D., University of Rochester, 1992. *Astrophysics*. Astrophysics.

DEPARTMENTAL RESEARCH SPECIALTIES AND STAFF**Theoretical**

Biophysics. Physical mechanisms for biological effects of ultrasound. Wu.

Condensed Matter Physics. Electronic and transport properties of metals, random alloys, and liquid metals; lattice dynamics; order-disorder phase transitions in alloys; superconductivity; superfluidity; strongly correlated electron systems; electronic properties of graphene; ultracold atom-surface scattering; Berry-phase effects in condensed matter systems. Clougherty, Del Maestro, Kotov.

Experimental

Acoustics. Physical mechanisms for biological effects of ultrasound. Wu.

Astrophysics. Pulsar radio-frequency emission; pulsars as probes of the interstellar medium. Rankin.

Biophysics. Spectroscopy of proteins and nucleic acids and the use of biomolecules in nanotechnological applications. Vanegas.

Condensed Matter Physics. Spin-polarized magneto-optical spectroscopy studies of nitride semiconductors; the time-resolved spectroscopy of nitride emitters and semiconductor nanocrystals; magneto-optical Kerr rotation spectroscopy of ferromagnetic nanostructures. Furis, White.

Materials Science, Metallurgy. Kinetics of thin-film growth and etching; real-time X-ray and electron diffraction studies of materials growth and surface evolution. Furis, Headrick, White.

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.