

UNIVERSITY OF OREGON

DEPARTMENT OF PHYSICS

Eugene, Oregon 97403-1274
<http://physics.uoregon.edu>

Students Accepted For Degree	FIELDS		
	Physics	Astronomy	Related Fields
Doctorate	X		
Master's	X		

1. General

President: Dave Frohnmayer
Dean of Graduate School: Richard Linton
Department Chairman: Stephen Kevan
Department Telephone Number: (541) 346-4751
Type of Institution: University
Control: Public
Setting: Small city
Total Faculty: 1,580
Total Graduate Faculty: No distinction made
Total Students: 20,044
Total Graduate Students: 3,161
Annual Graduate Tuition:
In-state residents: Full-time—\$8,958 (9–16 credits)
 Part-time—reduced rates
Out-of-state residents: Full-time—\$13,734 (9–16 credits)
 Part-time—reduced rates
Tuition rates for: 2003–04
Deferred tuition plan: Yes
Other Fees: \$275.00 for TAs
Term: Quarter

2. Number of Faculty in Department

The combined total of full-time faculty in the three professorial ranks is 32. The combined total of full-time, part-time, and other faculty at all ranks is 36.

3. Admission, Financial Aid, and Housing

Address admission inquiries to: Department of Physics
Graduate application fee required: None
Admission deadline (Fall admission): 7/15; 1/15 to assure equal consideration
Admission information: For fall admission, 2003, 21 students were accepted from 193 applicants. 17 were offered teaching assistantships.
Admission requirements: For admission to the graduate programs, a Bachelor's degree in physics or related subject is required with a minimum undergraduate GPA of 3.0 in advanced physics and mathematics courses. The GRE is required. No minimum acceptable score for admission is specified. The GRE Advanced Test in physics is required. The median GRE scores for fall, 1999 admission with teaching assistantships were verbal–590; quantitative–770; total–2,050. The median physics advanced score was 710. Students from non-English speaking countries are required to demonstrate proficiency in English via the TOEFL exam. Minimum acceptable score is 500 for admission, 600 for teaching assistants. Supplemental English training after arrival may be required for TOEFL scores below 575. Therefore, scores above 600 are given preference.

Undergraduate preparation assumed: Familiarity with material

at a level found in the following text books: Classical Mechanics: Chow, *Analytical Mechanics*; Electricity and Magnetism: Griffiths, *Introduction to Electrodynamics*; Statistical and Thermal Physics: Reif, *Statistical and Thermal Physics*; Modern Physics: Gasiorowicz, *Quantum Physics*.

Address financial aid inquiries to: Department of Physics
GAPSFAS application required: No

Financial aid deadline: 1/15 complete application file (to assure consideration)

Loans available: Yes

Address housing inquiries to: University Housing, Walton Hall, University of Oregon

On-campus, single student housing available: Yes

Cost/term: \$2,847–3,701 (room and board)

On-campus, married student housing available: Yes

Cost/month: \$445–880

Table A—Faculty, Enrollments, and Degrees Granted

Research Specialty	2005–06 Faculty	Enrollment ¹ Fall 2005		No. of Degrees Granted ² 2005–06 (2000–06)			Median No. of Years for 2000–06 Ph.D.'s
		Master's	Doc-torate	Master's	Terminal Master's	Doc-torate	
Applied Physics	0	0	0	0(0)	5(19)	0(0)	–
Astrophysics	4	0	0	0(0)	0(0)	0(0)	–
Atomic, Molecular, & Optical Physics	6	0	0	0(0)	0(0)	3(17)	7
Biophysics	3	0	0	0(0)	0(0)	0(2)	6
Chemical Physics	0	0	0	0(0)	0(0)	0(2)	8.5
Condensed Matter Physics	9	0	0	0(0)	0(0)	1(13)	6
Particles & Fields	8	0	0	0(0)	0(0)	3(8)	8
Physics Education	3	0	0	0(0)	0(0)	0(0)	–
Non-specialized	0	3	81	3(69)	7(0)	–	–
Total		3	81	3(69)	12(19)	7(42)	
Full-time Grad. Stud.		3	81				
Part-time Grad. Stud.		0	0				
First-year Grad. Stud.		3	22				
Median Years in Grad. Study (2005–06 Degrees)		1.5	7				
Undergraduate Degrees, 2005–06 (2000–05):				17(87)			

¹ Students not yet committed to a research specialty are entered under non-specialized.

² Five-year totals in parentheses.

4. Graduate Degree Requirements

Master's: 45 credit hours of graduate level courses, including 32 credits of physics and at least 24 credits of University of Oregon graded courses, are required. These must include at least one 3-term sequence in physics at the 600-level and an approved sequence in mathematics. A maximum of 15 hours of credits earned in another accredited graduate school with a grade of B or better may be counted. A minimum GPA of 3.0 must be maintained. Command of a foreign language is recommended but not required. A Master's final examination, or a thesis, or a certain course requirement has to be satisfactorily completed.

Applied Physics Master's: The department offers an Applied

Physics Masters Program that leads to a professional M.S. degree. This degree is an alternative to the research-based Ph.D. and is more oriented towards the needs of industrial physicists than the traditional masters degree. This program includes an Internship component. The applied Physics Masters Program is offered through the U of O Materials Science Institute (see <http://materials.science.uoregon.edu/Grad/Masters/Overview.html>).

Doctorate: The student must pass a qualifying examination covering undergraduate- and masters-level physics in mechanics, electricity and magnetism, optics, modern physics, thermodynamics, and statistical physics. Students generally must complete core graduate courses in mechanics, statistical physics, electromagnetic theory, and quantum mechanics, though they can be excused based on previous study. In addition, students must take a total of six other one-quarter courses, including at least one 2 quarter sequence, chosen from the following areas: Condensed Matter Physics; Nuclear and Particle Physics; Atomic Physics and Molecular Physics; Astronomy and General Relativity; Experimental and Theoretical Techniques; Interdisciplinary. An oral comprehensive examination and a thesis are required. Proficiency in a foreign language is recommended but not required. Three years work beyond the Bachelor's degree is required, of which three consecutive terms must be on the Eugene, Oregon campus.

Thesis: Thesis may be written *in absentia*.

Special Equipment, Facilities, or Programs:

Institutes and Centers

The University of Oregon has several interdisciplinary institutes in which many physics faculty participate:

The Materials Science Institute (MSI, <http://www.uoregon.edu/~msiuo/>) focuses much of its efforts on the creation and study of new materials and devices, but also addresses more abstract questions in experiment and theory. The MSI has a wide range of fabrication and characterization capabilities located both in individual laboratories and in common facilities. An important mission of the MSI is education and in this connection it promotes integrated research between various departments and conducts Summer Industrial Internship programs in semiconductor processing, polymer technology, and (with the OCO), optics and photonics. The MSI is a founding member and partner of the Oregon Nanoscience and Microtechnologies Institute (ONAMI, <http://www.onami.us/>).

The Oregon Center for Optics (OCO, <http://oco.uoregon.edu/>) brings together scientists from several departments inside and outside the university who have a common interest in the science and/or technology of light. To this end it also runs a vigorous seminar series. While the OCO has a very broad range of facilities supporting fundamental studies in classical and quantum optics, the growth of communications technology based on optics also leads to increasing interactions between the OCO and industry.

The Institute of Theoretical Science (ITS, <http://www.uoregon.edu/~its/>) is a center for theoretical research in overlapping areas of physics, chemistry and mathematics. It provides an environment in which theorists can share common themes and mathematical approaches.

Biophysicists in the Institute for Molecular Biology (IMB, <http://www.molbio.uoregon.edu/>) apply techniques drawn from physics to biological problems. The Institute provides common facilities for growth of cells and more-standard analytical tools of biology and biochemistry as well as supporting specialized biophysics facilities such as structural imaging workstations.

The Center for High Energy Physics (UOCHEP, <http://zebu.uoregon.edu/~uocheep/>) supports experimental and theoretical high energy physics research activities at the University of Oregon and at various external laboratories, including the CERN, Fermilab and SLAC accelerator facilities and the LIGO gravitational wave observatories.

Departmental and Other Facilities

Pine Mountain Observatory (<http://pmo-sun.uoregon.edu/>) houses several telescopes and is equipped with CCD cameras for remote data collection.

The Center for Advanced Materials Characterization at Oregon (CAMCOR, <http://www.uoregon.edu/~msiuo/Outreach/CAMCOR/About.html>) is a centralized facility of the Materials Science Institute in which state-of-the-art apparatus is available to the campus and wider community. A new building will be occupied by CAMCOR in Fall, 2007.

The Shared Laser Facility (SLF) is a multidisciplinary laboratory available to the university community and others by arrangement. Faculty members may either set up long-term experiments in the SLF or use shared equipment for short-term experiments. SLF personnel also provide expertise in setting up experiments in user laboratories.

The Technical Services Administration (TSA) maintains professional and student machine shops, and an electronic shop.

Table B—Appointments to Graduate Students, 2005–06

Title of Appointee	Appointments		Academic Load Allowed in Credit Hours	Hours of Service Per Week	Stipend for Academic Year (\$)
	Total	First year			
			Quarter		
Teaching Assistant	28	22	9–16	16	1545.68
Research Assistant	56	0	9–16	16	1545.68
Total	84	22			

5. Personnel Engaged in Separately Budgeted Research, 7/00–6/01

Professorial faculty	25
Other faculty	1
Postdoctoral appointments	10
Graduate students	38
Undergraduate students	10
Nonteaching research personnel	2
Total	86

6. Separately Budgeted Research Expenditures by Source of Support

	Departmental Research	Physics-related Research Outside Department
Federal government	\$6,501,609	\$
State and local government	149,946	
Private, non-profit organizations	151,645	
Other	1,543,645	
Total	\$8,346,477	\$

7. Separately Funded and Managed Centers Laboratories

Pine Mountain Observatory	\$138,987
Total	\$138,987

Table C—Separately Budgeted Research Expenditures

Research Specialty	No. of Grants	Expenditures (\$)
Astronomy	5	59,525
Astrophysics	2	8,258
Biophysics	7	795,818
Condensed Matter Physics	13	1,431,116
Energy Sources & Environ.	6	225,370
Low Temperature Physics	2	901,796
Nuclear Physics	1	85,697
Optics	18	1,526,924
Particles & Fields	5	1,484,513
Physics Education	6	289,815
Total	100	6,399,666

FACULTY

Professors

- Belitz**, Dietrich, Dr.rer.nat., Munich, 1982. Associate Dean of Science. Condensed matter theory.
- Bothun**, Gregory D., Ph.D., Washington, 1981. Astronomy.
- Brau**, James E., Ph.D., MIT, 1978. Experimental elementary particle physics.
- Cohen**, J. David, Ph.D., Princeton, 1976. Experimental solid state physics.
- Crasemann**, Bernd, Ph.D., California, Berkeley, 1953. Emeritus. Atomic physics.
- Csonka**, Paul, Ph.D., Johns Hopkins, 1963. Elementary particle theory; accelerators.
- Deshpande**, Nilendra G., Ph.D., Pennsylvania, 1965. Elementary particle theory.
- Donnelly**, Russell J., Ph.D., Yale, 1956. Emeritus. Classical and superfluid hydrodynamics.
- Frey**, Raymond E., Ph.D., California, Riverside, 1984. Experimental elementary particle physics.
- Goswami**, Amit, Ph.D., Calcutta, 1964. Emeritus. Theoretical nuclear physics.
- Haydock**, Roger, Ph.D., Cambridge, 1972; Sc.D., Cantab, 1989. Solid state theory.
- Hsu**, Stephen D. H., Ph.D., University of California, Berkeley, 1991. Elementary particle theory.
- Hwa**, Rudolph C., Ph.D., Brown, 1962. Emeritus. Elementary particle theory.
- Imamura**, James N., Ph.D., Indiana, 1981. Astrophysics.
- Kevan**, Stephen D., Ph.D., California, Berkeley, 1980. Experimental solid state physics.
- Lefevre**, Harlan W., Ph.D., Wisconsin, 1961. Emeritus. Experimental nuclear physics.
- Matthews**, Brian W., Ph.D., Adelaide, 1963. Protein crystallography.
- McDaniels**, David K., Ph.D., Washington, 1960. Emeritus. Experimental nuclear physics; solar energy.
- Overley**, Jack C., Ph.D., Cal. Tech., 1960. Emeritus. Experimental nuclear physics.
- Park**, Kwangjai, Ph.D., California, Berkeley, 1965. Emeritus. Fluid mechanics.
- Rayfield**, George W., Ph.D., California, Berkeley, 1964. Emeritus. Membrane biophysics.

- Raymer**, Michael G., Ph.D., Colorado, 1979. Quantum optics.
- Remington**, Stephen James, Ph.D., Oregon, 1977. Protein crystallography.
- Sokoloff**, David R., Ph.D., MIT, 1972. Science education.
- Soper**, Davison E., Ph.D., Stanford, 1971. Elementary particle theory.
- Strom**, David, Ph.D., Wisconsin, Madison, 1986. Experimental elementary particle physics.
- Toner**, John, Ph.D., Harvard, 1981. Condensed matter theory.
- Wang**, Hailin, Ph.D., Michigan, 1990. Quantum optics.
- Zimmerman**, Robert L., Ph.D., Washington, 1963. Emeritus. Theoretical astrophysics; general relativity.

Associate Professors

- Deutsch**, Miriam, Ph.D., Hebrew Univ., 1996. Quantum optics.
- Gregory**, Stephen, Ph.D., Waterloo, 1975. Associate Chairman for Graduate Studies. Experimental condensed matter.
- Linke**, Heiner, Ph.D., Lund University, 1997. Experimental Condensed Matter Physics/Biophysics.
- Nöckel**, Jens, Ph.D., Yale, 1997. Optical Physics.
- Schombert**, James, Ph.D., Yale, 1984. Astronomy.
- Taylor**, Richard, Ph.D., 1988, Univ. of Nottingham, U.K. Experimental solid state physics.
- Torrence**, Eric, Ph.D., MIT, 1997. Experimental High Energy Physics.

Assistant Professors

- Kribs**, Graham, Theoretical High Energy Physics.
- Parthasarathy**, Raghuvier, Ph.D., Univ. Chicago, 2002. Experimental solid state and biophysics.
- Steck**, Daniel, Ph.D., Texas, 2001. Experimental and theoretical optical physics.
- van Enk**, Stephen, Ph.D., Theoretical Optical Physics.

RESEARCH SPECIALTIES AND STAFF

Theoretical

- Astronomy. Modeling of astrophysical fluid flows and plasmas. Imamura.
- Condensed Matter. Electronic energy structure; cohesion; and electronic properties of solids; localization of electronic states in amorphous semiconductors. Belitz, Haydock, Toner.
- Elementary Particles and Fields. Theory of elementary particles. Csonka, Deshpande, Hsu, Hwa, Kribs, Soper. 3 postdoctoral fellows.
- Fluids. Superfluid mechanics. Donnelly.
- Optics. Theoretical optics. Nöckel, van Enk.

Experimental

- Astrophysics. Photometry of binary star x-ray sources, low brightness galaxies. Bothun, Schombert.
- Biophysics. X-ray crystallography of proteins; membrane biophysics. Linke, Matthews, Parthasarathy, Rayfield, Remington. 12 postdoctoral fellows.
- Condensed Matter. Phonon and electron transport in low-dimensional systems; electronic properties of amorphous semicon-

ductors; surface physics. Cohen, Gregory, Kevan, Linke, Taylor. 4 postdoctoral fellows.
Elementary Particles. Brau, Frey, Strom. 3 postdoctoral fellows.
Energy Sources. Solar energy. McDaniels. 1 postdoctoral fellow.

Fluid Mechanics. Classical and superfluid hydrodynamics. Donnelly.
Optics. Quantum optics. Deutsch, Gregory, Raymer, Steck, Wang. 1 postdoctoral fellow.