

**Chair and Wayman Crow
Professor of Physics**

John W. Clark

McDonnell Professor of Physics

Clifford M. Will

**Albert Gordon Hill Professor of
Physics**

James G. Miller

**Charles M. Hohenberg
Professor of Experimental
Physics**

Stuart A. Solin

Professors

Carl M. Bender
Claude W. Bernard
Thomas Bernatowicz
James H. Buckley
Anders E. Carlsson
Mark S. Conradi
Ramanath Cowsik
Willem H. Dickhoff
Michael W. Friedlander
Patrick C. Gibbons
Charles M. Hohenberg
Martin H. Israel
Jonathan I. Katz
Kenneth F. Kelton
Richard E. Norberg
Michael C. Ogilvie
James S. Schilling
Wai-Mo Suen

Professors Emeriti

Dan I. Bolef
James H. Burgess
Peter A. Fedders
Kazimierz Luszczynski
Peter R. Phillips
John H. Scandrett
J. Ely Shrauner
Ronald K. Sundfors

Joint Professors

Shankar M. L. Sastry
Lee G. Sobotka

Research Professors

Robert W. Binns
Alex P. Meshik
Ernst Zinner

Associate Professor

Ralph Wessel

Physics

Entering students should normally have completed undergraduate physics courses at the intermediate level of mechanics, electromagnetic theory, quantum physics and statistical mechanics, with mathematics courses to or beyond advanced calculus.

Candidates for the Ph.D. are required to complete 72 units of credits, approved by a departmental advisor, with passing grades and a B average or better. At least 36 of the 72 units must have been earned in classroom or seminar courses at the 400-level or higher, of which at least 18 units must be in 500 level courses. In addition to courses in physics, credit towards the degree may be earned in courses in mathematics, engineering, chemistry and other departments if approved by the departmental advisor. Not more than 36 units may be earned in Physics 595-596, which are concerned with research and supervised teaching of physics.

Candidates for the Ph.D. must satisfy a teaching requirement. Teaching Assistants are expected to enroll in Physics 597-598, Teaching Methods in Physics.

Candidates for the Ph.D. degree are required to demonstrate significant accomplishments in research, resulting in the production of an acceptable dissertation, covering original research, followed by an oral examination in defense of the dissertation.

Advancement to Ph.D. candidacy is based on satisfactory performance on a written qualifying examination, coursework and available information on teaching and research abilities and potential. Each component is an important part of the overall evaluation, and students are evaluated individually. The written qualifying examination is given in sections at the beginning of each spring semester; students must complete the examination within the first two years of full-time graduate study.

Students are normally accepted for graduate work towards the Ph.D., although students are occasionally accepted to work towards the Master of Arts degree. Candidates for the M.A. degree are required to present a minimum of 30 units with passing grades and a B average or better; at least 24 units must be in classroom or seminar courses at the 400-level or above. Not more than 6 units of the 30 may have been earned in Physics 593-598. Either acceptable performance, at the Master's level, on the written qualifying examination for the Ph.D., or preparation of a Master's thesis approved by the departmental advisor is required. In the latter case, the course requirement is reduced from 30 to 24 units. In addition to courses in physics, credit towards the degree may be earned in courses in mathematics, engineering, chemistry and other departments if approved by the departmental advisor.

There is no foreign language requirement for the Ph.D. or A.M. degree in physics.

A comprehensive Graduate Student Handbook (available online, see URL below), which discusses in detail requirements and resources, is given to all physics graduate students.

For information contact the Graduate Secretary: voice (314) 935-6250, FAX (314) 935-6219, or visit the web page <http://wuphys.wustl.edu/Academics/Graduate/indexHandbook.html>.

Research Associate Professor

Christine Floss
Mark H. Holland
Daniel J. Leopold

Assistant Professors

Mark G. Alford
Ramki Kalyanaraman
Henric Krawczynski
Yan Mei Wang
Zohar Nussinov

Research Assistant Professor

Mark R. Holland

Lecturer

Rebecca L. Trousil

Adjunct Professors

Charles H. Anderson
Vijai V. Dixit
Elliot L. Elson
Robert Falster
Victor A. Khodel
F. Bary Malik
Jeffrey E. Mandula
John S. Rigden
Manfred L. Ristig
Samuel A. Wickline
Dimitriy A. Yablonskiy
William M. Yen

Adjunct Associate Professors

Eric R. Christian
Gregory L. Comer
Thomas E. Conturo
Philip B. Fraundorf
Sandor J. Kovacs, Jr.
Ian H. Redmount

Adjunct Assistant Professors

Mary M. Leopold
David S. Sept

Phys

- 411 Mechanics 3 units.
- 421-422 ... Electricity and Magnetism 3 units/semester.
- 427 Introduction to Computational Physics 3 units.
- 441-442 ... Selected Topics in Physics IV
1 to 3 units/semester.
- 450 Physics of the Brain 3 units.
- 451 Advanced Laboratory I
3 units.
- 452 Advanced Laboratory II
3 units.
- 455 Physics of Vision 3 units.
- 463 Statistical Mechanics and Thermodynamics 3 units.
- 471 Quantum Mechanics I
3 units. (*Identical with Electrical Engineering 471*)
- 472 Solid-State Physics 3 units.
- 473 Quantum Mechanics II
3 units.
- 474 Nuclear and Particle Physics 3 units.
- 476 Astrophysics 3 units.
- 500 Independent Work 6 units maximum, to be arranged.
- 501-502 ... Methods of Theoretical Physics 3 units/semester. (*Identical with Mathematics 501-502*)
- 503 Advanced Mathematical Methods for Physicists and Engineers I 3 units.
- 504 Advanced Mathematical Methods for Physicists and Engineers II 3 units.
- 505-506 ... Classical Electrodynamics 3 units/semester.
- 507 Classical Mechanics 3 units.
- 523-524 ... Quantum Mechanics 3 units/semester.
- 529 Statistical Mechanics 3 units.
- 530 Advanced Topics in Statistical Mechanics 3 units.
- 534 Magnetic Resonance 3 units.
- 535 Ultrasonics 3 units.
- 537 Materials Physics I 3 units.
- 539 Materials Physics II 3 units.
- 540 Quantum Theory of Many-Particle Systems 3 units.
- 542 Nuclear Physics 3 units.
- 545 Solar System Astrophysics 3 units.
- 546 Galactic Astrophysics 3 units.
- 547 Introduction to Elementary-Particle Physics 3 units.
- 549 Solid-State Physics I 3 units.
- 550 Solid-State Physics II 3 units.
- 551 Relativistic Quantum Mechanics 3 units.
- 552 Relativistic Quantum Field Theory 3 units.
- 557 Gravitation and Cosmology 3 units.
- 558 Relativistic Astrophysics 3 units.
- 563 Topics in Theoretical Biophysics 3 units.
- 565 Magnetism and Superconductivity 3 units.
- 570 Planetary Geophysics 3 units. (*Identical with Earth and Planetary Sciences 570*)
- 589-590 ... Selected Topics in Physics Credit to be arranged.
- 593-594 ... Introduction to Methods in Physics 2 units/semester.
- 595-596 ... Research Credit to be arranged.
- 597-598 ... Supervised Teaching of Physics 2 units/semester.