

Degrees

The department offers two graduate degrees: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in Physics.

The M.S. degree requires completion of a minimum of 30 course hours beyond the Bachelor's degree, and is available with a thesis or a non-thesis option.

The Ph.D. program requires a minimum of 18 course hours beyond the Master's degree, and completion of the Department qualifying examination at the Ph.D. pass level. The program is designed to prepare the candidate to engage in independent research and creative activity. The final stage of the program requires students to orally defend a dissertation documenting original research performed by the student under the supervision of a faculty member.

Financial Support

Several financial aid packages are available to support students. Incoming students are usually granted a teaching assistantship, but in some cases research assistantships may be given to first-year students. There are also several summer research fellowships. In addition, all regular teaching and research assistants are granted a full tuition waiver and medical insurance by the University.

Research Programs

The experimental and theoretical research programs in the Department of Physics and Astronomy are concentrated in the following emphasis areas:

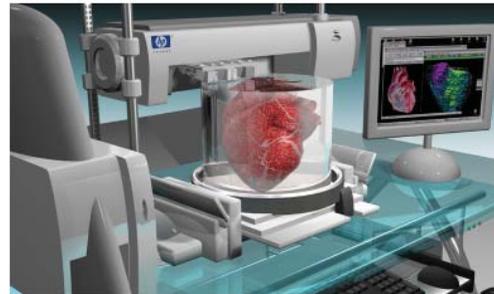
- Biological Physics
- Experimental Condensed Matter Physics
- Theoretical Condensed Matter Physics
- Astrophysics and General Relativity
- Physics Education

Biological Physics

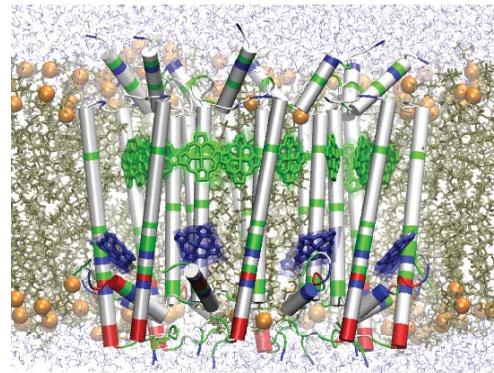
Faculty: Shie-Jie Chen, Gabor Forgacs, Kattesh Katti, Gavin King, Ioan Kosztin, Xiaoqin Zou

The Biological Physics group includes theoretical, experimental and computational investigators. Strong emphasis is placed on translational research – the implementation of laboratory research results in a clinical setting. Major research projects include:

- Nanomedicine
- Cellular biomechanics
- Single molecule studies
- Computational biophysics
- RNA folding and assembly
- Computational drug design



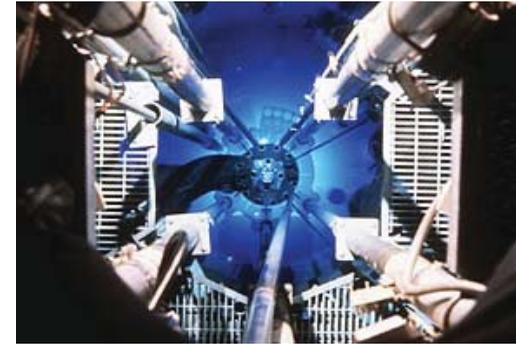
Organ printing — an artist's conception



Light-harvesting proteins: a new generation of solar energy nano-devices?

Experimental Condensed Matter & Materials Physics

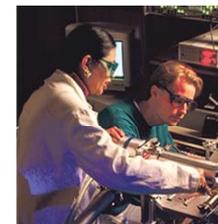
Faculty: H.R. Chandrasekhar, Meera Chandrasekhar, Suchi Guha, Paul Miceli, Wouter Montfroi, Peter Pfeifer, Haskell Taub, Owen Vajk, Ping Yu



Missouri Research Reactor

The Condensed Matter and Materials Physics group studies a wide range of materials, from inorganic/organic semiconductors to magnets and molecular systems. The group is strongly involved in fundamental as well as technological aspects of many materials science problems. Current experimental research projects include:

- Biomedical optical imaging
- Organic displays and photovoltaics
- ZnO-based optoelectronics
- High pressure optical spectroscopy
- Magnetic fractals
- Organic thin films and biomembranes
- Neutron and x-ray scattering
- Alternative fuel research



Laser lab



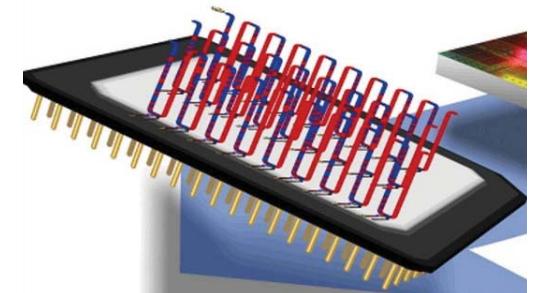
Organic electronics lab

Condensed Matter Theory

Faculty: Peter Pfeifer, Sashi Satpathy, Carsten Ullrich, Giovanni Vignale, Carlos Wexler

The Condensed Matter Theory group has vigorous research programs in virtually all the areas of this pivotal branch of physics. Programs include:

- Electronic structure of materials
- Magnetic devices and spintronics
- Quantum many-body theory
- Density-functional theory
- Transport and optical excitations in semiconductors
- Quantum and classical statistical mechanics, fractals and phase transitions



Racetrack memory: one of many futuristic devices studied by condensed matter theorists of the department



From corn to tank: alternative fuel research

Astrophysics & General Relativity

Faculty: Sergei Kopeikin, Aigen Li, Bahram Mashhoon, Angela Speck

The members of the Astrophysics Group are doing research in some of the most fundamental problems in cosmology and gravitation, such as:

- The origin and fate of the Universe
- Gravitational radiation
- Post-Newtonian gravity
- Black holes
- Cosmic dust
- Galactic chemical evolution.

The activities of the group include a program of both theoretical and observational research focusing on the role played by cosmic dust in the formation and evolution of stars and planets, in the origin of molecules, and in the shaping of galaxies.



The Helix Nebula from the Hubble Space Telescope

Physics/Science Education

Faculty: Deborah Hanuscin

Physics/Science Education research focuses on effective strategies for college science teaching and teacher education. Current projects include

- Writing-to-learn strategies
- Formative assessment tools
- Inquiry-based teaching methodologies

Leisure

With its many cultural activities, concert series, theaters, restaurants, nightclubs, and natural beauty, Columbia offers great opportunities for fun all the year round.



The MKT Nature Trail, starting in downtown Columbia, runs through miles of pristine woods across Missouri.



Student Recreation Center



Downtown Columbia - the Twilight Festival

Admissions

The Department of Physics and Astronomy encourages applications from students who have successfully completed their undergraduate studies. To submit an application you must complete the following steps:

- (1) Apply online to the graduate school at MU
- (2) Send the following material directly to the Department of Physics and Astronomy:
 - Application for Graduate Appointment in Physics
 - Three letters of recommendation
 - Statement of Purpose
 - Results of the GRE General and Physics tests
 - Official Transcripts
 - Results of the TOEFL test (only international students)

<http://www.physics.missouri.edu/admissions/graduates/>

Inquiries regarding the application process should be directed to
Director of Graduate Studies
223 Physics Building
University of Missouri,
Columbia, MO 65211
Phone: 573-882-2467
Email: ullrichc@missouri.edu



Graduation ceremony

Graduate Studies in Physics and Astronomy

University of Missouri–Columbia
<http://www.physics.missouri.edu/>



The Department

The Department of Physics and Astronomy, with 30 faculty members, is one of the most vigorously growing departments in MU's College of Arts and Science. It offers a friendly and intellectually stimulating environment, where students and faculty work together on exciting problems at the cutting edge of science and technology. The three main areas of research are

- Biological Physics
- Condensed Matter Physics
- Astrophysics and General Relativity

All research projects are supported by external grants, and enhanced by outstanding departmental and university facilities. These programs provide great opportunities for graduate students to work with internationally recognized scientists while earning a masters and/or a doctoral degree. Most of our graduates land high-quality jobs and achieve distinction in academia, industry, government and business. The city of Columbia provides excellent living conditions, a stimulating cultural atmosphere, and a vibrant student life.