Graduate Program in Physics

WHY BRYN MAWR PHYSICS?
- Small student-oriented classes
- Exciting and cutting-edge research
- Opportunities for collaborative and interdisciplinary work
- A liberal arts college setting near the city of Philadelphia
- Diverse and progressive teaching experiences

CURRENT RESEARCH ACTIVITIES
- High energy physics, quantum field theory, and string theory
- Nanoscale materials fabrication, characterization, and application
- Ultracold Rydberg atoms
- Plasma, laboratory astrophysics, fusion energy and turbulence
- Molecular spectroscopy and dynamics
- Galaxy Evolution and Dynamics

GRADUATE GROUP IN SCIENCE AND MATHEMATICS
- Interdisciplinary group including graduate programs in Chemistry, Mathematics and Physics
- Promotes scholarly and social interactions among graduate students

EXCELLENT LABORATORY FACILITIES
- Atomic force microscope
- Electrochemical deposition system
- Class 1000 soft-curtain cleanroom
- Vibrating Sample Magnetometer
- X-ray diffractometer
- Solid state NMR spectrometer
- Various tunable pulsed and CW laser systems
- Molecular beam apparatus
- Two ultrahigh vacuum systems for laser cooling and trapping
- Machine and Instrument shop
- Extensive information technology and library resources
- High vacuum plasma chamber
- 10kV pulse power plasma source

INTERDISCIPLINARY AND INTERNATIONAL COLLABORATIONS
- Interdisciplinary collaborations with chemistry, mathematics, geology, and computer science programs at Bryn Mawr
- Collaborations with neighboring universities, for example, University of Pennsylvania, Haverford College, Swarthmore and Villanova University
- Collaborations with scientists at national laboratories and with international research groups
- Access to the Advanced Photon Source (APS) of Argonne National Laboratory
- Access to the Large Plasma Device (LAPD) at UCLA

WHAT OUR STUDENTS DO NEXT
Postdoctoral Appointments
University of Pennsylvania,
NIST/University of Maryland,
Vanderbilt University, Lawrence Livermore Laboratory

Academic Positions
University of Michigan, Rice University, Stony Brook University,
University of Connecticut, Drew University, Dickinson College, Mount Union College, Ursinus College,
Bates College, Middlebury College,
Denison University, Chestnut Hill College

Industry Positions
IBM, Lucent Technologies, Naval Research Laboratory, AT&T Bell Laboratories

PH.D. DEGREE REQUIREMENTS
- Complete 12 course or supervised research units (a full time load is 6 units per year)
- Pass a set of qualifying exams
- Write and defend a doctoral thesis describing original research

FINANCIAL SUPPORT
- Teaching and Research Assistantships (12 month) - $25,000-30,000
- Tuition Coverage and Health Insurance Subsidy - $29,300
- Total Financial Package - $54,300-59,300

VISIT
Experience Bryn Mawr Physics firsthand! To arrange a visit, contact Professor David Schaffner by phone at 610-526-7846 or by email at dschaffner@brynmawr.edu

Learn more:
www.brynmawr.edu/ggsm/physics
Xuemei May Cheng, Associate Professor  
Ph.D., Johns Hopkins University, 2006  
Research: Nanomaterials and spintronics

May’s research focuses on the fabrication, characterization and application of nanoscale materials. Projects include: templated electro-chemical deposition of nanoscaled materials for energy and medical applications; time-resolved imaging of spin dynamics in magnetic nano-structures; and x-ray magnetic circular dichroism study of multiferroic materials and intense magnetism. She has received an NSF CAREER award, two NSF MRI grants, and regular NSF grants. She has access to DOE user facilities at national laboratories.

Kate Daniel, Assistant Professor  
Ph.D., Johns Hopkins University, 2015  
Research: Astrophysics

Kate’s primary interests are galaxy evolution and dynamics. She makes analytic arguments, builds galaxy models and uses moderate simulations to explore the orbital response of stars to non-axisymmetric structures in the disk, like spiral arms, giant molecular clouds, or dark matter substructure. She focuses on understanding dynamical responses to resonances in the disk, the nature of transient spiral structure, and the formation of major structural components of a disk galaxy. Kate has received major funding through the NSF and AAUW.

David Schaffner, Assistant Professor  
Ph.D., University of California, Los Angeles, 2013  
Research: Plasma physics

David’s research focuses on measuring and understanding the turbulent nature of hot ionized gases called plasmas. His main interest lies in comparing the turbulent nature of laboratory-based plasmas to astrophysically relevant versions such as that found in the solar wind (a plasma ejected by the sun at Mach 10 out into the solar system) or in the magnetosphere (the plasma which surrounds the Earth and is confined by the Earth’s magnetic field). In addition to building a new plasma physics facility, he collaborates with Swarthmore College on a fusion research project through ARPA-E, and conducts basic plasma studies on the Large Plasma Device (LAPD) at UCLA.

Michael W. Noel, Professor  
Ph.D., University of Rochester, 1996  
Research: Ultracold Rydberg atoms

Mike’s research focuses on experimental studies of ultracold samples of highly excited atoms. The impact of these experiments is broad, with connections to condensed matter physics of spin glasses and crystals; low temperature atomic, molecular, and optical physics involving many-body interactions; and low temperature plasma physics. He received an NSF CAREER award in 2002. His work is currently supported by the NSF.

Michael B. Schulz, Associate Professor  
Ph.D., Stanford University, 2002  
Research: High energy physics, quantum field theory, string theory

Michael’s work focuses on string theory and its applications to particle physics and cosmology. His current research seeks to elucidate the rich geometrical structure that underlies generalized string theory compactifications, and to develop a more complete picture of how ten dimensional string theory gives rise to realistic four dimensional quantum field theories that can describe our world.