Earth and Planetary Sciences

The Department of Earth and Planetary Sciences offers PhD and AM degrees. This is one of the few departments in the country with an integrated program of graduate instruction and research that treats Earth as a planet and makes direct use of knowledge gained by exploring the solar system. Our field is changing rapidly and becoming more interdisciplinary as links emerge among geology, geochemistry, geophysics and geobiology. New opportunities are developing as research in natural hazards, energy sources, and the environment become more important to the global economy, and new space missions are developed to explore the solar system. The relatively small size of the department engenders a friendly and personal place, offering a lot of personal interaction with faculty and researchers. Our graduate students have the opportunity to use cutting-edge laboratory equipment, high-speed parallel computers, and the latest planetary mission data in the course of their research. They travel to field sites around the world and publish research in the leading scientific journals.

The PhD program is open to qualified students who have previously specialized in earth sciences, physics, chemistry, biology, environmental science, soil science, mathematics or engineering. Both students with traditional degrees in geoscience areas and those with diverse academic backgrounds regularly enroll in our program because of the inherently interdisciplinary nature of our field. Doctoral education has a strong research emphasis that begins immediately upon arrival and emphasizes modern, quantitative approaches to studying earth, planetary, and environmental systems. Graduate study may involve field and laboratory work as well as theory and advanced computation. Students earn the AM degree during the first phase of the PhD program; the department generally does not admit students for a terminal AM degree. After degree completion our graduates go on to careers in academia, research laboratories, government agencies and the private sector, serving as leaders in the field of earth and planetary sciences.

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Faculty

Chair  
Viatcheslav S. Solomatov  
PhD, Moscow Institute of Physics and Technology

Endowed Professors

Raymond E. Arvidson  
PhD, California Institute of Technology  
James S. McDonnell Distinguished University Professor

Bradley L. Jolliff  
PhD, South Dakota School of Mines and Technology  
Scott Rudolph Professor of Earth and Planetary Sciences

Douglas A. Wiens  
Robert S. Brookings Distinguished Professor  
PhD, Northwestern University

Professors

Robert E. Criss  
PhD, California Institute of Technology  
Robert F. Dymek  
PhD, California Institute of Technology  
M. Bruce Fegley  
M. Bruce Fegley Professor of Earth and Planetary Sciences  
PhD, Massachusetts Institute of Technology

William B. McKinnon  
PhD, Yale University  
Jill D. Pasteris  
PhD, Yale University

Jennifer Smith  
Dean of the College of Arts & Sciences  
PhD, University of Pennsylvania  
William Hayden Smith  
PhD, Princeton University

Michael E. Wysession  
PhD, Northwestern University

Associate Professors

Jeffrey G. Catalano  
PhD, Stanford University  
David A. Fike  
PhD, Massachusetts Institute of Technology  
Philip A. Skemer  
PhD, Yale University

Assistant Professors

Alexander S. Bradley  
PhD, Massachusetts Institute of Technology  
Bronwen L. Konecky  
PhD, Brown University
Degree Requirements

PhD in Earth and Planetary Sciences

The degree requirements for a PhD in Earth and Planetary Sciences are intended to ensure that all students develop independence and originality of thought and acquire knowledge that has sufficient breadth and depth to be scientific leaders in their field. Students are required to complete eight courses, six of which must be taken in the Department of Earth and Planetary Sciences. Students entering with an AM degree in a closely related field may waive two of these course requirements if approved by the faculty.

Students begin research early in the program, completing a small project in their second semester. At this time each student selects a faculty member to serve as the major adviser as well as two additional faculty members to provide additional guidance; these three faculty members comprise each student’s Research Advisory Committee. During their second year, students continue this research as they work toward the oral examination at the end of their second year, which requires preparation of a research paper, an oral presentation of research results, and a question and answer session with the Research Advisory Committee. Students are also required to obtain experience in teaching during their studies. The PhD program culminates in the writing of a dissertation and its defense in an oral presentation.

AM in Earth and Planetary Sciences

The department offers two tracks for completion of the AM degree. Both tracks require completion of six courses, five of which must be taken in the Department of Earth and Planetary Sciences. One track toward the AM degree is a component of the PhD degree program, with students being awarded an AM upon successful completion of the oral examination in the second year of the program. The other track is for students seeking a terminal AM degree. This requires completion of a master's thesis and its defense in an oral presentation by the end of the second year of study.