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 that 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 as new space missions are developed to explore the solar system. The relatively small size of the department engenders a friendly and personal place that offers 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 throughout 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 that emphasizes modern, quantitative approaches to studying Earth, planetary, and environmental systems. Graduate research may involve field and laboratory studies 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 terminal AM degrees. 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
James S. McDonnell Distinguished University Professor
PhD, Brown University

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

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

Professors

Jeffrey G. Catalano
PhD, Stanford University

Robert F. Dymek
PhD, California Institute of Technology

M. Bruce Fegley
PhD, Massachusetts Institute of Technology

David A. Fike
PhD, Massachusetts Institute of Technology

William B. McKinnon
PhD, California Institute of Technology

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

Alexander S. Bradley
PhD, Massachusetts Institute of Technology

Philip A. Skemer
PhD, Yale University

Assistant Professors

Bronwen L. Konecky
PhD, Brown University
AM in Earth and Planetary Sciences

The department offers two tracks for the completion of the AM degree. Both tracks require the completion of six courses, four 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 that occurs during the second year of the program. The other track is for students seeking a terminal AM degree. This track requires the completion of a master's thesis and its defense in an oral presentation by the end of the second year of study.

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 that they acquire knowledge of sufficient breadth and depth to be scientific leaders in the field. Students are required to complete eight courses, five 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 during 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 further guidance; these three faculty members comprise the student's Research Advisory Committee. During their second year, students continue their research as they work toward the oral examination that occurs at the end of their second year, which requires the 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.