Department of Geology
COLLEGE OF ARTS AND SCIENCES

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 2, 2015

The Department of Geology is pleased to offer the following research project for the summer of 2015. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

PROJECT TITLE
DEFINING EARTHQUAKE ACTIVE FAULTING USING REMOTE SNSING AND COSMOGENIC NUCLIDES

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Project Description

Defining rates of movement along active geologic faults is important for earthquake hazard assessment and mitigation. To do this we must be able to identify the fault zone and recognize landforms that have been cut and displaced by the fault. By measuring the amount of displacement of landforms by the fault and determine the age of the displaced landform it possible to calculate the rate of fault motion. The length of the fault and its rate of movement are proportional to its seismic potential. This project will examine one of the world's greatest faults, the Chaman Fault, which runs along the borders of Pakistan and Afghanistan. The Chaman Fault is equivalent in size to the San Andreas Fault and has been responsible for several catastrophic earthquakes in recent history. Determining the nature of the Chaman fault will aid in earthquake hazard assessment and how important this fault is to understanding regional and global tectonics.

We will use remote sensing to determine the fault's location and length, and will date landforms using a relatively new dating method - terrestrial cosmogenic nuclides (TCNs) surface exposure dating. The student will be trained in remote sensing methods utilizing a variety of satellite images, and laboratory methods to process sediment samples from landforms for ^{36}Cl TCN dating in the TCN Laboratory. Determining the age of landform from ^{36}Cl requires mathematical modeling of the data. We encourage students who wish to develop their knowledge in Earth science, remote sensing, chemical laboratory work and mathematical modeling to apply.