

USGS NSF GRIP Opportunity

- USGS Center:** Earthquake Science Center
- Project Title:** Aseismic slip and earthquake occurrence
- Project Hypothesis or Objectives:** Transitions between seismic and aseismic faulting control the down-dip depth extent of earthquakes, the rapidity and amount of near surface earthquake slip, and influence the slip and propagation rate of transient aseismic (slow) slip events that are intermediate between brittle and ductile deformation. At present little is known about the particular conditions and environmental factors (mineralogy, pressure, temperature, strain rate and pore-fluid composition) that control the rheological transitions between aseismic and seismic deformation, and that control the spatial and temporal extent of one behavior or the other. The objective of this graduate research internship is to conduct new experimental research at high pressures and temperatures representative of the transition zone between seismic and aseismic faulting and to delineate the conditions leading to slow slip.
- Duration:** up to 12 months
- Internship Location:** Menlo Park, California
- Area of Discipline:** Geophysics, Seismology, Experimental Rock Mechanics
- Expected Outcome:** For USGS research results from this project will contribute to improved hazards assessments through physics-based, rheological constraints on the extent of earthquake rupture and the severity of the ground motions. For the intern the project will lead to valuable insights into the physics of faulting, experience in laboratory experimentation, access to the broad resources and expertise of the advisors and associated scientists at the ESC, and unique scientific contributions to their dissertation research and resume.
- Special skills/training Required:** Prior experience in laboratory rock mechanics is desirable but not required. However, mechanical aptitude and a strong interest in conducted laboratory experiments is required.
- Duties/Responsibilities:** With the research advisors' assistance the intern will develop an experimental research program to investigate the transitions

between aseismic and seismic fault slip. Intern's responsibilities will include conducting the experiments, analyzing the results, and reporting the findings at professional meetings and in one or more peer-reviewed journal publications.

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