

Fault structure and flash-weakening during earthquake slip.

Professor Frederick Chester, Center for Tectonophysics, Texas A&M University

Numerous experimental rock-deformation studies show that frictional heating along crustal faults can lead to dramatic reduction in strength during earthquakes, and such weakening appears to explain some characteristics of earthquake rupture. However, natural faults are rough over a large range of length scales making it difficult to apply the results of experiments conducted on small test samples. I will present the results of our recent experimental work using a novel rock deformation apparatus to directly image, for the first time, the distribution of flash heating on surfaces sliding at seismic slip rates, which provides evidence that seismic weakening processes are scale dependent.