SLAC COLLOQUIUM SERIES

Excitation and Propagation of Earthquake Ground Motions: Improving our Understanding of Earthquake Hazards

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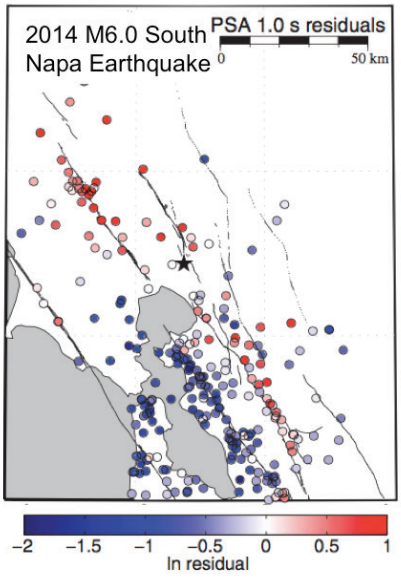

Abstract:
Earthquake ground-motion data and magnitude-distance attenuation relationships, coupled with earthquake recurrence statistics and fault models, are the basis for our seismic hazard maps and building codes. Seismic hazard maps are constructed in a probabilistic sense for a given rate of recurrence; thus improving the accuracy, and likewise the precision, of ground-motion attenuation models can yield reductions in the hazard level. Understanding ground-motion observations and relations can also yield significant insight into earthquake source physics and physical characteristics of the earth structure. Through the connection of physical models with observations of earthquake ground shaking, I demonstrate how we are improving our ability to create region-specific ground-motion models. This involves better representation of the earthquake source and specifically understanding the physics of high-frequency ground motion genesis; constraining path-specific attenuations using seismic velocity models; and new representations for attenuation or amplification at seismic stations or specific sites of interest. Lastly, because ground-motion observations are naturally variable, I will discuss how improved ground-motion models will also reduce the number of false- and missed alerts for earthquake early warning systems.

May 21, 2018, Kavli Auditorium, Refreshments and Colloquium Start at 3:45pm