

# ***Exotic Seismic Sources: Nuclear explosions, mining events, volcanic and geothermal seismicity, and a landslide***

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A seismic moment tensor is a description of the force system involved in the excitation of seismic waves in the Earth. The Berkeley Seismological Laboratory has been routinely computing seismic moment tensors of earthquakes in near-realtime for nearly three decades using three-component, long-period complete waveforms recorded at local and regional distances, yielding the refined estimate of Moment Magnitude, as well as fault parameters (strike, slip and dip). This analysis has contributed to an extensive catalog of moment tensor solutions for the central and northern California region, and the automatic and reviewed moment tensor solutions are used in shared emergency response monitoring with the USGS. The moment tensor method is also applied to non-tectonic sources of seismic energy, which show interesting differences from earthquakes. In this talk I will describe the development of methods for studying earthquakes and non-tectonic seismic events, and draw on a variety of examples from ice quakes, nuclear explosions, landslides, and the Ridgecrest, California earthquakes.

**Biography:** Professor Douglas Dreger is an earthquake seismologist interested in earthquakes and other sources of seismic energy, and how the generated seismic waves propagate through the Earth. He has published over 130 peer-reviewed papers on seismic wave propagation, earthquake source parameters, and earthquake source inverse methods. The automated seismic moment tensor method he developed for UC Berkeley is now used by various institutions within the US, in Japan, Italy, and Taiwan.

He attended UC Riverside earning a BS in Geophysics, and Caltech, earning a MS in Geophysics and Ph.D. in Seismology, and has been affiliated with the Berkeley Seismological Laboratory since 1992. He teaches courses on geology, theoretical and observational seismology, and applied geophysics in the Department of Earth and Planetary Science.