

UC SANTA BARBARA  
Department of Earth Science

# Speakers Club

WEBB 1100 • THURSDAY April 11th. • 2:00 PM

## Placing geological constraints on ruptures processes of earthquakes

**Rafael Almeida**

**Yachay Tech University**

The factors that control the extent of ruptures of earthquakes are not well understood. Why does one event end and the next event continue? Recent improvements in seismological and geodetical instrumentation now allow us to observe the details of these ruptures with unprecedented detail. In this talk, I will mostly focus on the Gorkha earthquake of 2015 as a case study to discuss the potential controlling factors. We argue that the extent of this earthquake was determined by the geometry of the Main Himalayan Thrust (MHT). This earthquake had several particular rupture characteristics such as sharp gradients in slip, changes in frequency content of the rupture, and lack of afterslip that have been attributed to spatial variations in the frictional properties of the fault, but that can also be explained by variations in fault geometry. I will also briefly discuss how geodetic and geologic observations from the shallow sections of the MHT and other large subduction zone faults, which we use to infer rupture histories, can be misinterpreted if stress shadows are not considered. Better understanding these processes may allow us to improve our estimates of seismic hazard, as well as the likelihood of tsunamigenic earthquakes.