



# San Joaquin Geological Society

**Date:** Tuesday, November 10<sup>th</sup>, 2015

**Time:** 6:00 PM Social Hour  
7:00 PM Dinner  
8:00 PM Lecture

**Place:** Eagles Lodge  
1718 17<sup>th</sup> Street, Bakersfield, CA 93302

**PSAAPG Members & Mesozoics**  
\$25 w/ reservation  
\$30 without reservation

**Non PSAAPG Members**  
\$30 w/ reservation

**Full-time Students with ID:**  
\$10 - Courtesy of Chevron &  
California Resources Corp.

**\* RSVP \***

**By: Sunday, November 8<sup>th</sup>,  
2015**

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## ***Connecting Faults: Geometric Control of Slip Distribution***

Presented by Dr. Matthew d'Alessio  
California State University Northridge

**Abstract:** We often oversimplify plate boundaries as simple planar discontinuities between two blocks of crust, but every geologist has observed the intricate geometric complexities of natural fault systems. How important are these small scale complexities in determining the behavior of the entire fault system? I present examples from two fault systems at different scales that both include strands of sub-parallel strike-slip faults connected by minor faults: the San Francisco Bay Area and an ancient exhumed fault system in the granitic rocks of the Sierra Nevada Mountains. After mapping fault segments and determining their relative magnitudes of slip (slip rates for GPS from the Bay area and total slip from offset markers in the Sierras), I show numerical modeling that illustrates the importance the faults that connect the main sub-parallel strands of the faults. In the San Francisco Bay Area, these faults are often blind thrusts and it's not always possible to determine which faults are physically connected at depth. It's tempting to study the major strike-slip strands, but the way in which faults are connected ends up having a significant impact on the amount of fault slip. Slip, in turn, affects seismic hazard, fluid flow, and fault-controlled geomorphology.

**Bio:** Dr. d'Alessio has deep roots in earthquake country. He grew up in the Bay Area, and was home alone during the 1989 Loma Prieta Earthquake. Though he was traumatized at the time, he quickly forgot about earth science until his sophomore year in college when his introductory Geology class at Stanford University was the first class that required him to go to the beach. He majored in Geological and Environmental Sciences before crossing the Bay for graduate school at UC Berkeley, where he received his Ph.D. in Geology in 2004. Returning to the west side of the Bay, he was a Mendenhall Postdoctoral Fellow at the U.S. Geological Survey. Dr. d'Alessio's career has slowly shifted from science research to science education research. In 2007, he became a full time Earth Science teacher at El Cerrito High School, an urban public high school in the San Francisco Bay Area. Today he teaches future teachers as an Associate Professor in the Geology Department at California State University Northridge. His research focuses on promoting curiosity in science classrooms.

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