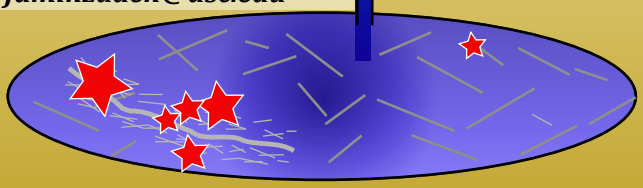
The USC Induced Seismicity Consortium (ISC) and Reservoir Monitoring Consortium (RSC) present:

Advanced Geophysical and Geomechanical Methods with Application to Fracture Characterization and Induced Seismicity

Dr. Thomas H.W. Goebel, University of California, Santa Cruz
Dr. Birendra Jha, University of Southern California

This two day short course will be held at ***USC*** in ***July 17-18, 2017.*** The ***cost*** (including breakfast and lunch) is $950, before June 1st, 2017 and $1050 afterwards. ISC or RMC members receive a $150 discount. The courses can be taken remotely. For details and registration please contact:
Prof. Fred Aminzadeh, faminzadeh@usc.edu

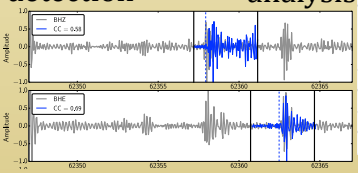


Main course topics:

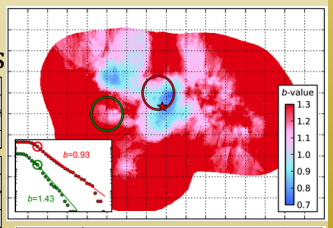
1. Introduce state-of-the-art methods for the analysis of micro-seismicity
2. Geomechanical simulation of hydraulic fracturing and microseismicity
3. Geomechanical modeling and analysis of pore pressure and fault stress
4. Hands-on problem-sets using real micro-seismicity data

Targeted audience: engineers, technicians and geoscientists with interest in seismicity analysis, reservoir characterization, reservoir geomechanics, and induced seismicity
Prerequisites: basic knowledge of source seismology, geophysics, reservoir engineering, MATLAB and python are beneficial but not required

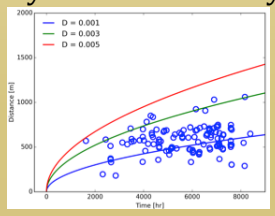
Advanced event detection

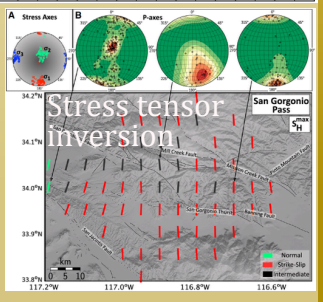


b-value analysis



Seismicity migration and hydraulic diffusivity



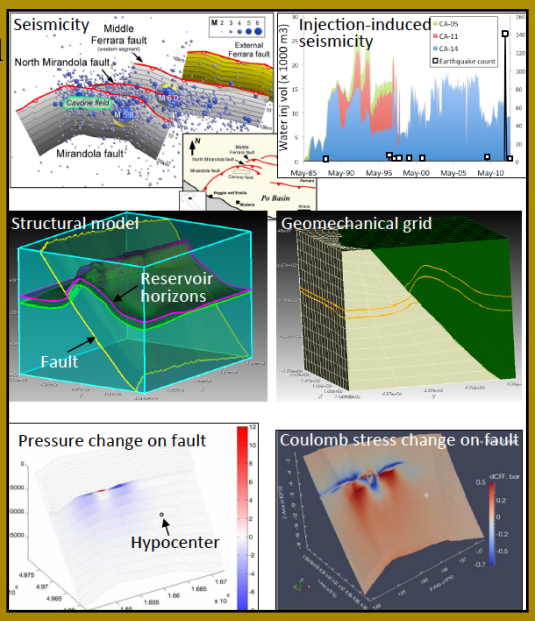


Day I: Advanced Microseismicity Analysis

-Use state-of-the-art analysis methods for micro-seismicity catalogs (b-value, clustering analysis, inter-event time distributions, seismicity migration etc.); Connect micro-seismicity and fracture networks; Estimate hydraulic diffusivity from seismicity migration;
- Resolve principle stresses from focal mechanisms

Day II: Geomechanical Modeling

- Conduct flow-geomechanical simulation by integrating geological, geophysical, and well data; Analyze changes in pore pressure and fault stresses due to production-injection and rock deformation; Determine fault stability and potential for induced seismicity



Instructors:

Dr. Goebel received his PhD from USC and worked as a Postdoctoral Fellow at Caltech, KIT, Germany and UCSC. His expertise is in applied seismology and earthquake source processes. (*http://pmc.ucsc.edu/~tgoebel*)

Dr. Jha is a Professor in Petroleum Engineering at USC. He received his MSc from Stanford and PhD from MIT. He has worked as a reservoir engineer in the oil and gas industry for several years. His expertise is in geomodeling, reservoir simulation, geomechanics and induced seismicity. Dr. Jha is contributing to many ongoing USC RMC and ISC projects. (http://gemlab.usc.edu)