



ARMA WORKSHOP ON MICROSEISMIC GEOMECHANICS FROM LABORATORY TO FIELD SCALE ACROSS ALL INDUSTRIES

Title: Microseismic Geomechanics across Scales and Industries

Date: Sunday, June 26, 2016

Co-chairs: Dr. Mel Grob, Dr. Frank Zhang

Over the past decade, geophysicists have made a collective push towards extracting more value out of microseismic data. This includes stimulated reservoir volume calculations, dominant fracture orientation and mechanism using amplitude ratio analysis, moment tensor inversion, and passive tomography. Microseismicity is generated by sudden displacement on pre-existing fractures or the rupture of new fracture and therefore, it represents only one component of the geomechanical response to rock deformation.

Another important topic is the scaling of microseismic source parameters such as magnitude. Laboratory rock experiments are useful to understand the link between rock deformation and acoustic emissions (microseismicity at the lab scale) in a controlled environment. Upscaling of lab experiment results is necessary to relate behavior of rock samples to that of reservoirs.

To understand the entire picture, researchers have adopted a microseismic geomechanics interpretation framework which will be the focus of this workshop. This framework is being used both at field and laboratory scales and is becoming prominent across many industries from oil&gas to mining or geothermal. In this workshop you will learn about microseismic geomechanics technology from experts across a wide range of industries and who are studying the physics of rock deformation over a wide range of length scales.

Agenda

08:00 Coffee

08:15 Challenges of Transparent Earth. **Dr. Charles Fairhurst** (*University of Minnesota*)

08:45 Industrial Applications of Integrated Microseismic and Geomechanical Interpretations. **Dr. Shawn Maxwell** (*IMaGE*)

09:15 Understanding Hydraulic Fracture Growth and Interactions with Natural Fractures. **Dr. Jim Rutledge** (*Schlumberger*)

10:00 Coffee

10:15 Time-lapse Passive Seismic Tomography for Rockmass Response in Deep Metal Mines. **Dr. Erik Westman** (*Virginia Tech*)

11:00 Induced Seismicity in the Development of EGS – Benefits and Drawbacks. **Dr. Derek Elsworth** (*Penn State*)

11:45 Panel Discussion – Led by **Dr. Charles Fairhurst** (*University of Minnesota*)

12:30 Lunch

13:30 Physics-based Modeling of Induced Earthquake Sequences and their Collective Properties. **Dr. David Dempsey** (*University of Auckland*)

14:15 Acoustic Emission Monitoring of Hydraulic Fracture Interaction with Rock Fabric. **Dr. Sergey Stanchits** (*Schlumberger*)

15:00 Coffee

15:15 Sustained Acoustic Emissions Following Laboratory-Scale Hydraulic Fracture Growth. **Dr. Andrew Bunger** (*University of Pittsburgh*)

16:00 Using Microseismic Data to Improve Hydraulic Fracture Treatment Design. **Dr. Mark Mack** (*IMaGE*)

16:45 Panel Discussion – Led by **Dr. Will Pettitt** (*Itasca*)

17:30 Close