



# RESERVOIR SYMPOSIUM

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*Reservoir Characterization for Energy Security*

## **Are You on the Correct Stress Path to Success in your Reservoir**

Speaker: Rick Chalaturnyk, University of Alberta

### **ABSTRACT**

This talk addresses the critical intersection between geomechanics and reservoir engineering, focusing on how mechanical rock behavior affects fluid flow during production or injection operations. Changes in fluid pressure and temperature alter rock stresses, causing deformation that modifies pore structure, fracture characteristics, and permeability - directly impacting fluid movement. While coupled reservoir geomechanical modeling is used to explore these processes, these models require fundamental input data characterizing stress-strain behavior and permeability relationships, often derived from laboratory testing when core samples are available.

The presentation will emphasize that geomechanical behavior should be determined using the same "stress path" that occurs in the actual reservoir, as different stress paths significantly impact stress-strain behavior and resulting permeability relationships. Using data from incorrect stress paths can yield meaningless or misleading results. The talk will review stress path concepts, examine laboratory data from various stress paths, present modeling examples illustrating typical stress scenarios, and discuss how these relate to reservoir flow property changes, ensuring reservoir engineers understand the importance of appropriate stress path selection.