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## **Rock Physics Signatures of Reservoir Heterogeneities**

Because of the increasing importance of oil recovery and the growing complexity of recently discovered oil fields, a major shift in the use of seismic methods has taken place during the past decade. Reservoir complexity is typically related to spatial heterogeneity in porosity, permeability, clay content, fracture density, etc. This spatial variability can only be obtained from remote geophysical measurements, especially seismic -- and only when these measurements can be understood in terms of reservoir properties.

Enormous strides have been made to understand the relations between the physical properties of reservoir rocks and geophysical observables -- the science now known as Rock Physics. We have gradually discovered more and more order in relations that once appeared disappointingly scattered, for example, velocity vs. porosity, porosity vs. permeability,  $V_p/V_s$  vs. saturation and lithology. But many issues remain, including: What are the key sources of uncertainty in Rock Physics methods for reservoir characterization, and how can they be reduced? How can we better incorporate geologic processes in seismic interpretation? The latter is perhaps the most promising -- we will discuss recently discovered seismic signatures of many important geologic changes, such as cementing, sorting, shaliness, lithology, fluid content, and compaction.