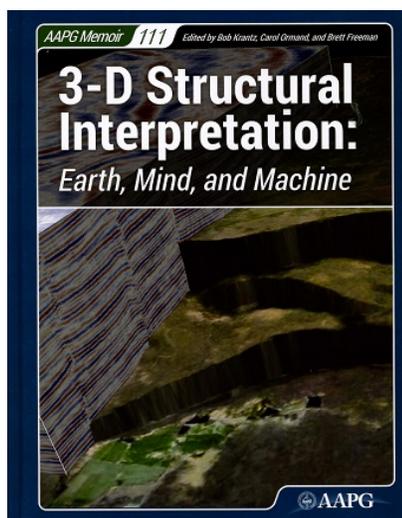


Amherst College Geology Department
Presents

**SPATIAL THINKING AND STRUCTURAL
INTERPRETATION: HOW GEOSCIENTISTS
LEARN TO SEE 3D**

Dr. Robert Krantz

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ConocoPhillips Applied Geoscience



Geologists as a group have and use above-average spatial thinking skills to interpret and communicate complex geologic structures. Interpretation challenges, especially with petroleum industry subsurface targets, come from abundant but still ambiguous data volumes, challenging geologic forms, powerful but difficult-to-learn software, and under-prepared staff. A growing body of research and literature reveals the significance and nature of spatial cognition, and the role it plays in science in general, geoscience more specifically, and perhaps for structural geology most of all.

Cognitive scientists recognize different categories of spatial skills and strategies. Many of these, like mental rotations, disembedding, and penetrative thinking relate directly to common and critical geologic tasks. Some research indicates that spatial skills can be trained, and that strategies used by novices and experts can differ significantly. Teaching 3D skills, and how to apply these in geologic interpretation, should use these insights. A recent and innovative industry training course provides one example of how new concepts of spatial cognition can be used to improve teaching

methods.

In 2013, an AAPG Hedberg conference explored 3D geologic interpretation. Industry interpreters and trainers, academic structural geologists, software developers, and cognitive scientists brought complementary perspectives to three days of presentations, posters, and discussions, plus a field day with interactive interpretation modules. Some key findings from the conference have significance for improving industry interpretation practices, and training new interpreters. Subsurface and outcrop interpretation present different but related challenges for spatial thinking, and provide insights to different types of cognitive abilities. Thus, the transition from academic experience for most industry new hires requires a shift in 3D geologic thinking. Many of these ideas are now published in a new AAPG Memoir based on the Hedberg Conference.

Wednesday, October 4 - 7:00 pm

Paino Lecture Hall, Beneski Earth Sciences Building
