

Monday, November 12, 2018

HGS General, International and N. American Dinner Meeting

Live Oak Room • Norris Conference Center • 816 Town and Country Blvd #210

Social Hour 5:30–6:30 p.m.

Dinner 6:30–7:30 p.m.

Cost: \$40 Preregistered members; \$45 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.

Pre-registration without payment will not be accepted.

Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

Gary Mavko

Professor Emeritus,

Stanford University

The Robert E. Sheriff Lecture Series

**Sponsored by the Department of Earth and Atmospheric Sciences
at University of Houston and the U.H. Geoscience Alumni Association**

In addition to the presentation by the guest speaker, Dr. Hua-wei Zhou, Chair of the Department of Earth and Atmospheric Sciences, will present an update of activities at U.H. as well as the departmental Outstanding Alumni Award. There will be a poster session on current thesis and dissertation research of U.H. students.

Come and meet the next generation of geoscientists from the University of Houston!

The Robert E. Sheriff Lecture Series was initiated in 1999 by the University of Houston Geoscience Alumni Association to honor Dr. Sheriff as an educator, scholar, and proponent for the geosciences. The series has recently been co-sponsored by the Houston Geological Society.

The Sheriff Lecture mission is to

**bring some of the best known geologists and geophysicists in the world to the Houston community
to share ideas relevant to exploration geology and geophysics, and to showcase geoscience activity
at the University of Houston.**

A full list of the Student Posters will be available on the HGS Website.

R.E. Sheriff Lecture: Navigating Messy Rock Physics Problems

Two common tools for modeling physical properties of rocks are *Estimators and Bounds*. Estimators predict a particular value of rock property: for example, Archie's Law to predict saturation or porosity, or Gassmann's equations to predict how effective moduli change when the pore fluid changes. In contrast, bounds predict the range of possible rock properties, given the limited information that we typically have in geophysics. Rock microstructure and heterogeneity are critical – determining where the measured value falls within the bounds, and why predictors sometimes fail or mislead us.

In this presentation, I'll show strategies for using bounds to navigate messy rock physics problems. Examples include (1) using bounds to test and sometimes falsifying popular predictors, (2) using bounds to infer microstructure from common measurements, and (3) using bounds, themselves, as predictors, especially in complex materials such as unconventional. I'll also touch on a less familiar topic: using bounds on the cross-relations between different measurements (elastic modulus, electrical resistivity, dielectric constant, thermal conductivity, etc.) on the same rock. Cross bounds help us to validate our multi-physics measurements and our assumptions used to interpret measurements. ■

Biographical Sketch

GARY MAVKO is a Professor of geophysics at Stanford University. He received his PhD in geophysics from Stanford in 1977. Gary then joined the Tectonophysics branch of the USGS in Menlo Park where he worked in areas of rock physics and earthquake fault mechanics. In 1984 Gary joined Entropic Geophysical, in its first months as a start-up reflection seismic processing company. Gary developed many of Entropic's algorithms and software for reflection and



refraction analysis, and eventually became their VP of research and development. He returned to Stanford in February, 1989, and is now Professor (Research) of Geophysics. He has been working on modeling and analysis of the acoustic properties of rocks and techniques of seismic interpretation for rock and fluid properties. In 2001 he was elected an Honorary Member of the Society of Exploration Geophysicists “for his deep understanding of rock physics and for the distillation of his ideas into the “squirt” theory for porous, saturated rocks”. Gary was a 2006 Distinguished Lecturer of the Society of Exploration Geophysicists.