Geophysical Society of Pittsburgh and the Pittsburgh Association of Petroleum Geologists

Monday, September 10th, 2012 Lecture:
SEG/AAPG Distinguished Lecturer
Shales and Imposters: Understanding Shales, Organics, and Self-resourcing Rocks
Manika Prasad, PhD. Colorado School of Mines

Abstract:

Shales are very commonly occurring sedimentary rocks. They are alternatively described by grain size (less than 2 micrometers), mineralogy (hydrous aluminosilicates), or sedimentary features (fissile, fine-grained, and clay-rich). The presence of clay minerals, hydrous aluminosilicates that are smaller than 2 μm can alter the elastic and plastic behavior of materials significantly. Load-bearing clays form weak links between the stronger mineral components. Knowledge about the elastic properties of clay is therefore essential for the interpretation and modeling of the seismic response of clay-bearing formations. However, due to the layered structure, small grain sizes, and reactive nature of clay minerals, their elastic properties are poorly known and show large differences (between 10 GPa and 400 GPa) between theoretical and measured values of clay moduli. This discrepancy is mainly due to various amounts of water adsorption by the clay minerals: Clay minerals are very reactive. Free radicals, such as hydroxyls, can alter their physical properties. I will discuss applications of rock physics and experimental data to calibrate observations made in the field, analyze experiments results on shales in controlled environment, and show various petrophysical controls on seismic properties, for example, on porosity, permeability, cementation, pore-filling, saturation, and compaction.

A special focus will be on "imposter" shales: organic-rich "shales" that are complete reservoir systems; they form the source, seal, and reservoirs. These rocks need not, and often do not have any clay content. The shale prospects of today (shale gas; shale oil; oil shale) are in mostly fine-grained organic-rich rocks. Successful exploration and production programs for organic-rich petroleum systems need reliable identification of their physical properties, maturity, and changes in mechanical, elastic, and flow properties through indirect methods. Although the processes that generate extractable hydrocarbons from kerogen are fairly well understood, indirect methods to detect organic content and maturity are not as well developed. For example, empirical relationships between shale pressures and downhole resistivity and sonic logs allow us to estimate total organic content. Assessment of maturity and hydrocarbon potential from indirect measurements can be greatly enhanced by establishing and exploiting correlations between physical properties, microstructure, and kerogen content.

Biography:

Manika Prasad *is an associate professor of Petroleum Engineering at the Colorado School of Mines. She directs the OCLASSH (Organic, Clay, Sand, Shale) research group and is the co-director of the Center for RockAbuse. Manika received a BS (Honors) in geology (with distinction), an MS (Diplom) in geology with marine geology and geophysics as minors, and a Ph.D. (magna cum laude) in geophysics, from the Christian-Albrechts-Universität at Kiel in Germany. Manika won the Merit Scholarship Award from University of Bombay for her BS achievements and the Friedrich-Ebert-Stiftung Scholarship for Ph.D. research at Kiel University. She has worked at the Mineral Physics Laboratory at University of Hawaii, Stanford Rock Physics Laboratory at Stanford University, and at the Center for Rock Abuse at the Petroleum Engineering and Geophysics departments at Colorado School of Mines. Her students have won student paper awards. She was an advisor for Native American Students at Stanford and was named Outstanding Mentor to Native American Students for two years in a row.*

Manika's main interests lie in understanding the basic principles governing the physical properties of rocks, fluids, and rocks with fluids. She is also interested in understanding how ant-sized phenomena control elephant-sized features. She has published widely in geophysical, geological, petroleum engineering, and nondestructive testing journals.

Please RSVP using the PayPal link on the Geophysical Society of Pittsburgh website at: www.thegsp.org

Please note that registration for this lecture will be limited to the first 150 registrants!

Cost $35 ($20 for Students). Meeting Location: DoubleTree by Hilton Hotel, 500 Mansfield Ave, Green Tree, PA

September Lecture Details:

4:45pm Social Hour

We are pleased to announce that this months social hour is proudly sponsored by CGG Veritas.

Hors D'oeuvres

- *To be determined (TBD)*

Beer & Wine

- *TBD*

5:45pm Dinner Buffet

- *Dry Rub New Orleans Style Beef Brisket*
- *Chipotle Chicken Breast with Pineapple Salsa*
- *Cape Cod with Lemon Butter Sauce*
- *Potato Salad with Bacon and Chives*
- *Grilled Vegetable Pasta Salad*
- *Roasted Red Potatoes*
- *Seasonal Vegetables*
- *Sliced Watermelon*

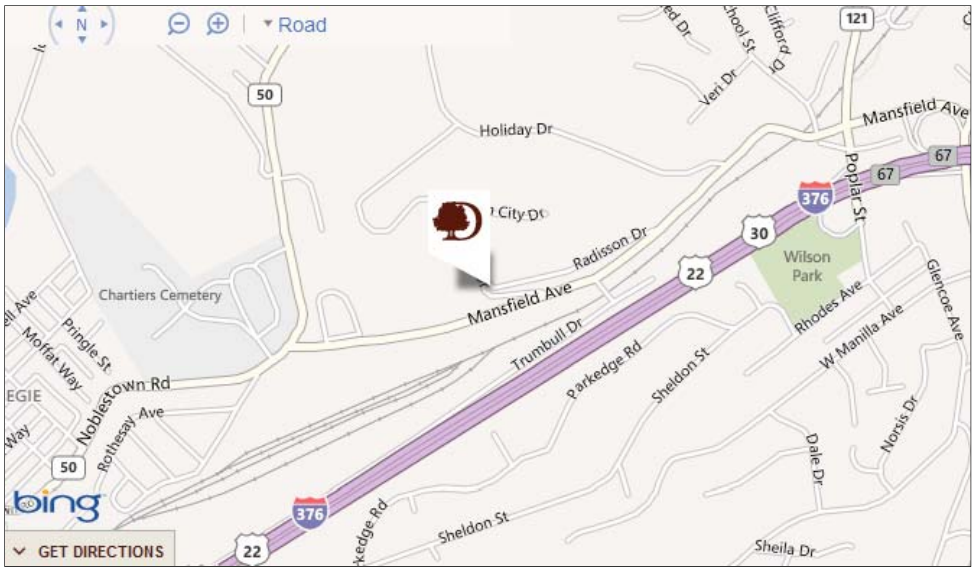
Dessert

- *Warm Apple Cobbler or Bread Pudding with Vanilla Anglaise*

7:00 pm Lecture

We are pleased to announce that this months lecture will be held at the DoubleTree by Hilton Hotel - Green Tree

DoubleTree by Hilton Hotel
500 Mansfield Avenue
Pittsburgh, PA 15205, United States
(412) 922-8400



Geophysical Society of Pittsburgh Upcoming Lecture Series:

September 10th: Shales and Imposters: Understanding Shales, Organics, and Self-resourcing Rocks – DoubleTree by Hilton, Green Tree, Pennsylvania

October 2th: 3-D Vertical Seismic Profiling: Improvements in Structural Imaging, Les Nutt, PhD, Schlumberger - Meeting to be at the Penn Brewery, 800 Vinial Street, Pittsburgh

November : Check Website for date and time

December :

January :

February :

March :

April :

Photo: Bill Harbert

Society of Exploration Geophysicists
The international society of applied geophysics

SEG Student Photo Contest

Share your photographic eye with the rest of the geophysics world by entering the SEG Student Photo Contest! The SEG University and Student Programs Department is seeking photographs representing the theme, ***"What is Geophysics to You?"***

Act now! The deadline to submit photos is 28 September.
All photos must be submitted to students@seg.org

Top 10 photos will be displayed at the SEG Annual Meeting in Las Vegas!

Prizes:

- **1st place: $300 USD, *and the front cover of TLE!***
- **2nd place: $200 USD**
- **3rd place: $100 USD**
- **4th - 10th place: $20 USD**

Be creative. Photos can be of places, people, events, etc. All photos received by the deadline will be placed on the SEG web site at www.seg.org/students. Top 10 photos will be displayed at the SEG Annual Meeting in Las Vegas!

Students make your plans now to attend the SEG Annual Meeting in Las Vegas, 4-8 November! Students receive a discounted registration.

Sincerely,
University and Student Programs

Please see the following webpage for more information:
http://www.seg.org/education/education-news/studentphotocontest

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