

# *Geophysical Society of Pittsburgh*

**DATE:** Tuesday, April 5th , 2011

**PLACE:** Radisson Hotel - Greentree  
101 Radisson Drive, Pittsburgh, PA 15220  
412-922-8400

**TIME:** 5:00 PM – Social Hour  
6:00 PM – Dinner  
7:00 PM – Speaker

**COST:** \$35.00

**PAYMENT:** Cash or Checks at the door. Please make checks payable to  
“Geophysical Society of Pittsburgh”

## **DINNER OPTIONS:**

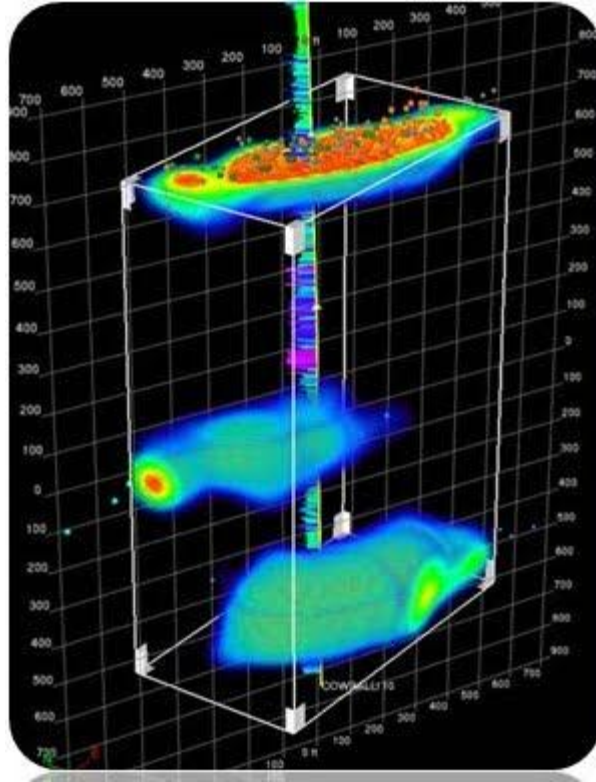
Shrimp Orecchiette: Orecchiette Pasta with Sauteed Shrimp, Diced tomatoes, Basil, Buffalo Mozzarella & Parmesan Cheese in a Light Garlic Oil. (A 2010 Award Winner at “A Taste of Pittsburgh.”). Includes salad, bread, and dessert of Caramel Apple Pie. Coffee, Tea, Decaf Coffee, Iced Tea.

Or

Roasted Organic Chicken: Herb Encrusted Chicken Breast with Meyer Lemon and a Natural Jus. Includes salad, bread, and dessert of Caramel Apple Pie. Coffee, Tea, Decaf Coffee, Iced Tea.

**Please note:** dietary intolerances or allergy considerations can be made with respect to dinner choices. Please contact Mr. Philip Towey for details.

**RSVP** by March 31<sup>st</sup>, to **Mr. Philip Towey**  
(email:Philip.Towey@cabotog.com)



*Presentation:*

## **Spectral Decomposition Iso-Frequency Analysis for Porosity Characterization in Carbonates**

*Brian Toelle*

*Schlumberger*

Abstract

During a recently completed study performed on a Silurian reef in the northern Michigan Basin a frequency analysis was conducted on the "Baseline 3D survey" of a 4D "time lapse" seismic survey. The objective of this project, conducted for the US Department of Energy on the Charlton 30/31 oil field, was to determine if standard, compression 4D seismic could be employed to monitor CO<sub>2</sub> injected into the reservoir during enhanced oil recovery operations. Instantaneous frequency analysis was shown to be a good indicator of high

matrix porosity zones within a Silurian reef during the initial stages of the study. Using this relationship a characterization of the porosity distribution within the reef was developed and used in a forward-looking reservoir simulation to predict the location of the CO<sub>2</sub> at the time the "Monitor 3D survey" of the 4D seismic survey was to be acquired. Amplitude analysis of the monitor survey supported the predicted location of the CO<sub>2</sub> and the porosity characterization. Recently, a spectral decomposition analysis was performed on this same data set. Results indicate that iso-frequency analysis is a preferable method for porosity detection.

## **Biography**

### ***Mr. Brian Toelle: Brief biography***

Brian Toelle obtained his M. Sc. in Structural Geology from Stephen F. Austin State Univ. in 1981 and joined Texaco's exploration department in Midland, Texas. For the first 14 years of his career he generated prospects and plays within the Permian Basin, Rocky Mountains, offshore California, and the Eastern Province of Saudi Arabia, first for Texaco and then Saudi Aramco. During the past 15 years he has been a consulting geoscientist for Schlumberger, conducting geoscience oriented studies in various basins within the US, Europe, China and North Africa. Currently he is a Principal Geophysicist for Schlumberger's Data and Consulting Services office in Pittsburgh where, in addition to performing projects for clients he is working on his Ph.D. at West Virginia University.