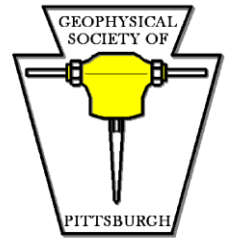


# Geophysical Society of Pittsburgh



**Tuesday April 3<sup>rd</sup>, 2012 Lecture:**

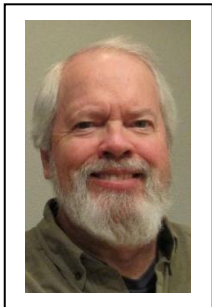
## **The Use of Seismic Emission Tomography (SET) for the Direct Mapping of Frac-Induced Fracture Networks and Their Connection to the Natural Permeability Field**

**Laird B. Thompson, PhD. Global Geophysical Services**

### **Abstract:**

A microseismic study was conducted in a shale gas reservoir in the eastern US in order to monitor a nitrogen frac job and to determine if direct observation could be made of the frac growth and of the natural fault and fracture fairways that are the main producing features in the reservoir. Using data from a series of frac stages, combined with an array of other data sets including field-wide pressure monitoring, interference testing as well as chemical and radioactive tracer testing, a 3D volume rendering of the reservoir production system has been attained. It is further shown that imaging micro-seismic acoustic energy can yield results that give significant insights into reservoir performance and that crustal deformation theory which predicts fracture control on permeability attributes appears sound. When interpreted using seismic tomographic processing principles, analyzed using crustal-physics based techniques and integrated with other data sets, micro-seismic data provide a powerful tool for optimizing production management in complex and unconventional reservoirs.

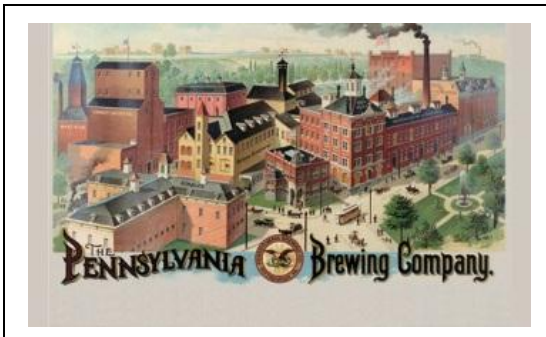
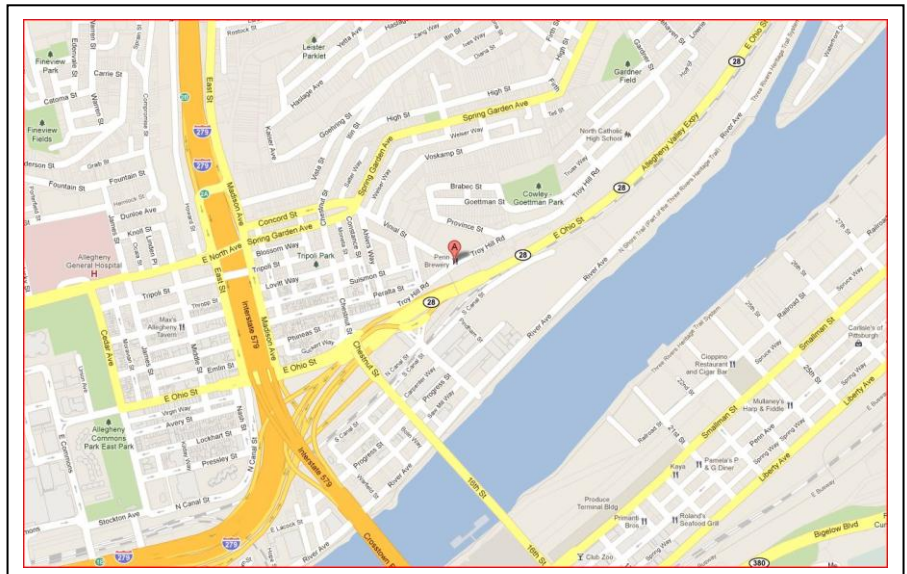
### **Biography:**



An industry recognized expert in borehole imaging interpretation and in the characterization of fractured reservoirs. Managed the R&D program for Mobil Oil Corp. in fractured reservoirs. Respected teacher in Mobil's training system and for AAPG. Able to work on or lead integrated teams studying reservoir description and management issues. Focused on the bottom line – directly involved in the discovery and production of 1.5 billion barrels of hydrocarbons.

**We are pleased to announce that this months lecture will be held at the Penn Brewery Restaurant , located at:**

**Penn Brewery Restaurant (Eisenhalle Room)  
800 Vinial Street  
Pittsburgh, PA 15212, United States  
(412) 237-9402**



**Please RSVP using the PayPal link on the Geophysical Society of Pittsburgh website at: [www.thegsp.org](http://www.thegsp.org)**

**Please note that registration for this lecture will be limited to the first 100 registrants!**

**Cost for this months meeting is \$35.**

## *April Lecture Details:*



### **4:45pm Social Hour**

*We are pleased to announce that this month's social hour is proudly sponsored by APEX HiPoint  
Thank You for Your Support!*

#### ***Hors D'oeuvres***

- *Side of Smoked Salmon with Pumpernickel, Cream Cheese, Chopped Eggs and Red Onions, and Capers.*

#### ***Beers on Tap***

- *Overlook IPA*
- *Penn Weizenbock*
- *Penn Dark*
- *Penn Pilsner*

### **5:45pm Dinner Buffet**

- *Wiener Schnitzel*
- *Schweinebraten*
- *Grilled Vegetable and Penne Pasta Alfredo*
- *Potato Pancakes*
- *Hot German Potato Salad*
- *Sauerkraut*
- *Tossed Green Salad with Ranch, Italian and Balsamic Dressing*

#### ***Dessert***

- *Apple & Cherry Pie*
- *Coffee*

### **7:00pm Lecture**

- *The Use of Seismic Emission Tomography (SET) for the Direct Mapping of Frac-Induced Fracture Networks and Their Connection to the Natural Permeability Field*

***Geophysical Society of Pittsburgh 2011-2012 Lecture Series:***

*September 6<sup>th</sup>: Is there a Place for Non-seismic Exploration in Unconventional Resource Plays*

*October 4<sup>th</sup>: The Value of Seismic Data in the Marcellus Shale Play*

*November 1<sup>st</sup>: Practical Seismic Petrophysics: The Effective Use of Log Data for Seismic Analysis*

*December 6<sup>th</sup>: Closure Stress Gradient Estimation of the Marcellus Shale from Seismic*

*January 10<sup>th</sup>: Rank-Reduction-Based 5D Trace Interpolation*

*February 7<sup>th</sup>: Microseismic Monitoring in Shale Field Development*

*March 6<sup>th</sup>: VSP Imaging Technology used for Assisting in Geosteering in Shale*

***April 3<sup>rd</sup>: The Use of Seismic Emission Tomography (SET) for the Direct Mapping of Frac-Induced Fracture Networks***

*May 1<sup>st</sup>: Pre-stack Depth Migration (PSDM) for Onshore Applications*



*The GSP October Lecture: The Value of Seismic Data in the Marcellus Shale Play.*

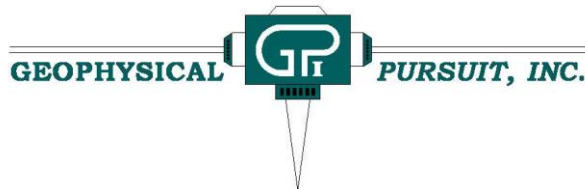
*Photo: Bill Harbet*

We would like to thank our 2011-2012 Corporate Sponsors:

**SILVER**

**GOLD**

**BRONZE**



~~~~~  
**2011-2012 GSP OFFICERS**

- |                          |                     |                                                                                |          |
|--------------------------|---------------------|--------------------------------------------------------------------------------|----------|
| • <i>President:</i>      | Ed Andrews          | <a href="mailto:eandrews@EXCOResources.com">eandrews@EXCOResources.com</a>     | EXCO     |
| • <i>Vice President:</i> | Craig Eckert        | <a href="mailto:ceckert@eqt.com">ceckert@eqt.com</a>                           | EQT      |
| • <i>Treasurer:</i>      | Jim Wigal           | <a href="mailto:jwigal@abartaenergy.com">jwigal@abartaenergy.com</a>           | Abarta   |
| • <i>Secretary:</i>      | Anthony Steenbergen | <a href="mailto:ASTEENBERGEN@talismanusa.com">ASTEENBERGEN@talismanusa.com</a> | Talisman |

~~~~~  
**Your Dues and Sponsorship in Geophysical Society of Pittsburgh go toward:**

- *Outstanding Monthly Lecture Series*
- *SEG Distinguished Lecturers*
- *Annual Scholarship Awards*
- *Student Grant Awards*
- *Annual Golf Outing*
- *Short Courses*

Please contact Jim Wigal  
([jwigal@abartaenergy.com](mailto:jwigal@abartaenergy.com)) for  
Sponsorship opportunities.

~~~~~  
*Thanks to all for your continued support in the past 2 years. You have all helped to make the GSP a success and we are honored to serve the Geophysical community of this region!*

# Calendar

- **March 22, 2012: PAPG Student Night**  
Bob Trevail, Dallas Energy  
See PAPG [website](#) for details



- **April 23, 2012 SPE**  
SPE Distinguished Lecturer Paul Francis  
**Automated Managed Pressure Drilling -- A Present and Future Game Changer**  
See SPE [website](#) for details



- **May 1, 2012: GSP Meeting, Penn Brewery Restaurant**  
**Prestack Depth Migration (PSDM) for Onshore Applications**  
Morgan Brown, Wave Energy



## **SEG Continuing Education – Spring 2012 – Southpointe Hilton Garden Inn, Pittsburgh, Pennsylvania**

- *May 14, 2012: Reservoir Geophysics: Applications by William Abriel (one day)*
- *May 14-15, 2012: May Seismic Fluid Detection, Reservoir Delineation, and Recovery Monitoring: The Rock Physics Basis by Gary Mavko*
- *May 14-15, 2012: Microseismic Monitoring in Oil or Gas Reservoir by Leo Eisner*

Sign up [here](#) for one of these great courses

GSP and its Sponsors are proud to be sending local students to this event thru our scholarship and student grant program.

## **This Summer:**

- **August 2012: 2<sup>nd</sup> Annual GSP Golf Tournament** -  
keep watching newsletters and our website for more details!

