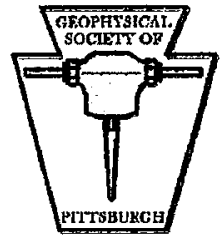


# *Geophysical Society of Pittsburgh*



*Tuesday, February 7<sup>th</sup>, 2012 Lecture:*

## *Microseismic Monitoring During Shale Field Development*

*Peter Duncan, MicroSeismic Inc.*

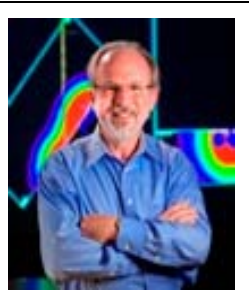
### **Abstract:**

*Microseismic monitoring has become an important facilitator to the development of shale fields. As many as 5% of the hydraulic fracture treatments performed in the US are now monitored, with some operators opting to monitor every well as they develop their field. Driving the increased penetration of this technology is an appreciation of the complexity of shales. The response of the rocks is seen to vary from well to well and stage to stage. The need to monitor more wells at a lower unit cost has led to the deployment of permanent monitoring arrays.*

*Another important development is the extraction of more information from the data. The original analysis was more directed at getting a better frac design. Recent developments are directed at producing a better understanding of how the reservoir will perform as a result of the frac'ing. Such analysis consists first of extracting the failure mechanism of each microseismic event from the data as well as its magnitude. The nature of the failure mechanism is deterministic of the stress regime in the reservoir. The distribution of event magnitudes also appears to be diagnostic as to whether new fractures are being created or existing fractures are being reactivated.*

*Taking this analysis further, one can actually make estimates of the fracture planes that created the microseismic events. With an assignment of permeability, the fracture model can be upscaled to a grid model that then can be used in a reservoir production simulation model to begin predicting well and field performance.*

### **Biography:**



*Peter M. Duncan was founding President of MicroSeismic, Inc. a Houston based geophysical service company where he now serves as Executive Chairman. He holds a Ph.D. in Geophysics from the University of Toronto. He began his career as an exploration geophysicist with Shell Canada before joining Digicon Geophysical, first in Calgary then in Houston. In 1987 he helped Digicon found ExploiTech Inc, an exploration and production consultancy. He was named President of ExploiTech when it became a subsidiary of Landmark Graphics in 1989. In 1992 he was one of 3 founders of 3DX Technologies Inc., an independent oil and gas exploration company where he served as Vice President and Chief Geophysicist. Duncan was 2003-04 President of the Society of Exploration Geophysicists (SEG). Duncan was the Fall 2008 SEG/AAPG Distinguished Lecturer speaking on the subject of passive seismic at 45 venues around the world. He is an Honorary Member of SEG, the Canadian Society of Exploration Geophysicists (CSEG), the Geophysical Society of Houston (GSH) and the European Association of Geoscientists and Engineers (EAGE). He received the Enterprise Champion Award from the Houston Business Journal in 2010 and the World Oil Innovative Thinker Award in 2011.*

*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.*

## ***February Lecture Details:***



**TESLA EXPLORATION INC.**

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

*We are pleased to announce that this months social hour is proudly sponsored by Tesla Exploration Inc.*

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

- *Swedish or Italian Meatballs*
- *Penn Pilsner Beer Cheese and Crackers*

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

- *Pale Ale*
- *Penn Gold Lager*
- *Penn St. Nikolaus Bock*
- *Penn Light*

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

- *Chef Carved Prime Rib with Au Jus*
- *Lemon Baked Cod with Beurre Blanc*
- *Grilled Vegetable and Penne Pasta Alfredo*
- *Baked Potatoes*
- *Rice Pilaf*
- *Fresh Vegetable Medley*
- *Tossed Green Salad with Ranch, Italian and Balsamic Dressing*

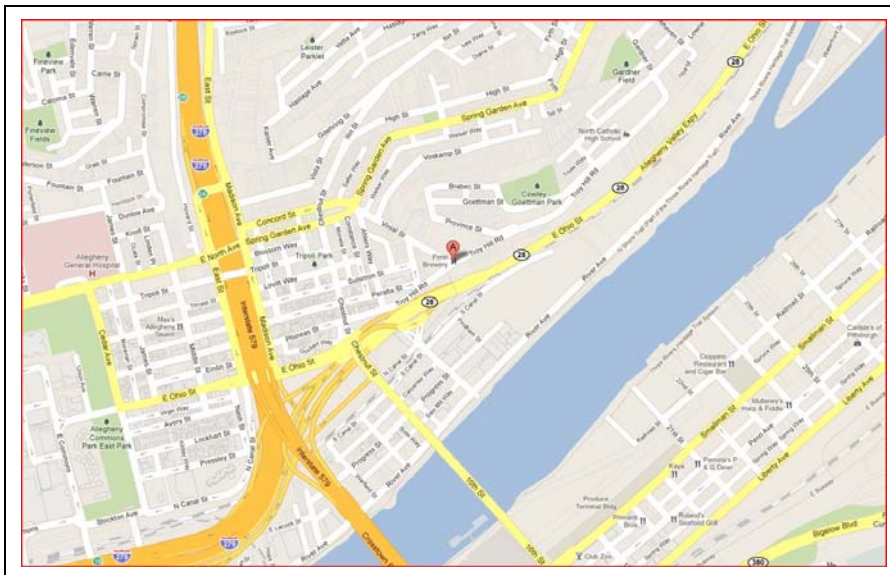
### ***Dessert***

- *Black Forest Sheet Cake*

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

***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*



***Geophysical Society of Pittsburgh Upcoming 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>: 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:

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