



THE ASCE PITTSBURGH SECTION GEO-INSTITUTE CHAPTER PRESENTS

Pittsburgh Chapter

December 2016 Dinner Meeting

How Hydraulic Fracturing Changed an Industry and How Research is Changing Hydraulic Fracturing

Presented By: *Dr. Andrew Bunger, University of Pittsburgh*



Hydraulic fracturing technology for stimulation of oil and gas recovery has evolved over nearly seven decades. Most recently it has been credited with unlocking vast resources that were previously uneconomical to produce. In so doing, hydraulic fracturing has revolutionized the industry and become one of the most influential innovations of our current century. As a technology, it is an intriguing example of youthfulness and maturity. The maturity manifests in that every approach used today is tied to origins that are decades old, and so engineering and innovation must always be understood in historical context. The first part of the talk will provide this context through a brief historical tour of hydraulic fracturing technology. On the other hand, the youthfulness arises because recent advances have opened entirely new challenges, providing many opportunities for innovation. The second part the talk will focus on one of these topics that being addressed at the University of Pittsburgh. Modern hydraulic fracturing is often aimed at uniformly stimulating 5,000-10,000 feet of horizontally-drilled wellbore. This goal of uniform stimulation is, of course, never perfectly achieved. The problem is that the current approaches almost never even come close. In a typical horizontal well around 40% of the well is ineffectively stimulated and therefore completely unproductive. The presentation will illustrate how understanding of hydraulic fracturing mechanics, developed through the use of hydraulic fracturing models, has led to a proposed way forward with the potential to drastically reduce unstimulated sections of wellbore with a subtle, no-cost modification of standard practice.

Andrew Bunger is an Assistant Professor in the University of Pittsburgh's Department of Civil and Environmental Engineering. He joined the University of Pittsburgh in 2013 after spending 10 years in Melbourne, Australia working in the Geomechanics Group within the Commonwealth Scientific and Industrial Research Organisation (CSIRO). His research interests include the mechanics of hydraulic fractures, coupled fluid-shale interaction, and the emplacement dynamics of magma-driven dykes and sills. He holds a PhD in Geological Engineering from the University of Minnesota.

Date: **THURSDAY, DECEMBER 8, 2016**

Place: Gaetano's Restaurant
1617 Banksville Road
Pittsburgh, PA 15216

Time: 6:00 PM Social Hour (Open Bar)
7:00 PM Buffet Dinner
8:00 PM Presentation

Reservations received on or before 11/29/16:

\$20 ASCE Pittsburgh Section Members
\$25 Non-members
Students are Free

Reservations received between 11/30/16-12/6/16:

\$25 ASCE Pittsburgh Section Members
\$30 Non-members
Students are \$10

PLEASE RSVP by contacting Mr. Alex Potter-Weight at APotter-Weight@menardgroupusa.com or by registering online at <http://www.asce-pgh.org/>.