

### May Section Meeting: Actually, It IS Rocket Science! Propellant Fracturing of Vertical and Horizontal Wells

This presentation describes a research project whose purpose was to develop a controlled propellant burning process that would produce multiple fractures in vertical or horizontal wells. A brief history of propellant fracturing will be given to familiarize the audience with the field. The choice of propellant was restricted by a set of criteria. A series of tests was performed to characterize the burn rate and gas generation rate as a function of pressure after a suitable propellant was found. The data from these tests were reduced to empirical expressions. These mathematical expressions describing the propellant burn, along with compressible flow theory and the fracture mechanics of the formation were used to develop a fully coupled computer code which describes the entire fracture process as a function of time. Test results are presented to verify the computer code. Finally, production histories from a number of wells are shown to verify the production increase in oil and/or gas wells.

Richard obtained both his BS and MS in Engineering from UCLA and after several years with the Jet Propulsion Laboratory in Pasadena, he obtained a PhD in Aerospace Engineering at USC. During his career he has authored 15 publications and holds 9 patents. He has been heavily involved in academia as a professor at Cal State LA, UNM, CSM, and CU, where he teaches thermodynamics, heat transfer and fluid mechanics. He is a member

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### May Section Meeting

**Topic:** Actually, It IS Rocket Science!  
Propellant Fracturing of Vertical  
and Horizontal Wells

**Speaker:** Richard Passamaneck,  
Colorado School of Mines and  
Propellant Fracturing and  
Stimulation, LLC

**Date:** Tuesday, May 19<sup>th</sup>

**Time:** 6:00 Social Time  
6:45 Dinner  
7:45 Presentation

**Location:** Hotel VQ  
1975 Mile High Stadium Circle  
Denver, CO 80204

**Menu:** Fresh mixed greens with dressing,  
succulent chicken grilled with  
roasted garlic and port wine demi-  
glaze, roasted rosemary potatoes,  
medley of fresh green vegetables,  
chocolate cake; coffee & Ice Tea

**Cost:** Members: \$20  
(w/RSVP)\* Non-Members: \$25  
Students & Unemployed: \$10

Please RSVP by Friday, May 15<sup>th</sup> (early RSVPs are greatly appreciated!) indicating your name, phone number, and number of attendees. Please RSVP to Martin Vorum by phone at 303-384-7414 or email at [rockyaiche@yahoo.com](mailto:rockyaiche@yahoo.com).

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of Sigma Xi, American Society of Mechanical Engineers, Society of Automotive Engineers, and the American Institute of Aeronautics and Astronautics and a registered engineer in Colorado. Richard is currently a Senior Lecturer at CSM and a partner with Propellant Fracturing & Stimulation.

## Get Involved in Your Rocky Mountain AIChE Section

As we wrap up the 2008-2009 program year, please consider volunteering for an officer position for the next program year. Being an officer is a great way to meet people, stay on top of new technology, practice leadership skills, and steer the future of your Rocky Mountain AIChE section. To get involved, contact Tom Wellborn at 303-933-0533 or Martin Vorum at 303-384-7414.

## AIChE RM Section Organizational Meeting

All officers are invited to a dinner meeting at Tom Wellborn's, home either Tuesday June 16th (most likely) or June 23, 6pm. RSVP to [twellborn@astraenergy.net](mailto:twellborn@astraenergy.net) for more info and directions.

## NEW MEXICO CORNER

*If you'd like to volunteer to speak at a future meeting or if you have any meeting/activity ideas, please let me know!*

Patrick Burton, New Mexico Liaison  
[pburton@nmu.edu](mailto:pburton@nmu.edu)

## Food for Thought

It takes a lot of courage to release the familiar and seemingly secure, to embrace the new. But there is no real security in what is no longer meaningful. There is more security and the adventurous and exciting, for in movement there is life, and in change there is power.

– Alan Cohen



Picture at left:  
Rocky Mountain AIChE Section Chair, Tom Wellborn, presents speaker, Michael Mutnan, with his "hand boiler" for an excellent overview of the ISO series of standards for engineering and manufacturing entitled: "What is ISO and How Do I Spell It?"

## *AIChE Meetings*

### **2009**

June 12-14 2009 Leadership  
Development  
Conference  
Augusta, GMA

Sept 13-19 2009 Ammonia  
Conference  
Calgary, Alberta

Nov 8-13 Annual Meeting  
Nashville, TN

### **2010**

Mar 21-25 2010 Spring Nat'l  
Tampa, FL  
San Antonio, TX

May 2-5 SBE's 2<sup>nd</sup> Annual  
Conference on Stem  
Cell Engineering  
Boston, MA

Oct 17-22 Annual Meeting  
Salt Lake City, UT

For further information, contact  
National AIChE.

### **National AIChE Contact Info**

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## *Rocky Mountain AIChE Officers*

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The objectives of AIChE are to advance chemical engineering in theory and practice, to maintain a high professional standard among its members, and to serve society, particularly where chemical, engineering can contribute to the public interest.

## **Rocky Mountain AIChE News Publication Schedule**

### September 2009 issue

Articles due Wednesday, September 9<sup>th</sup>

Publish on Friday, September 11<sup>th</sup>

Meeting on Tuesday, September 15<sup>th</sup>

## **MEETING SCHEDULE**

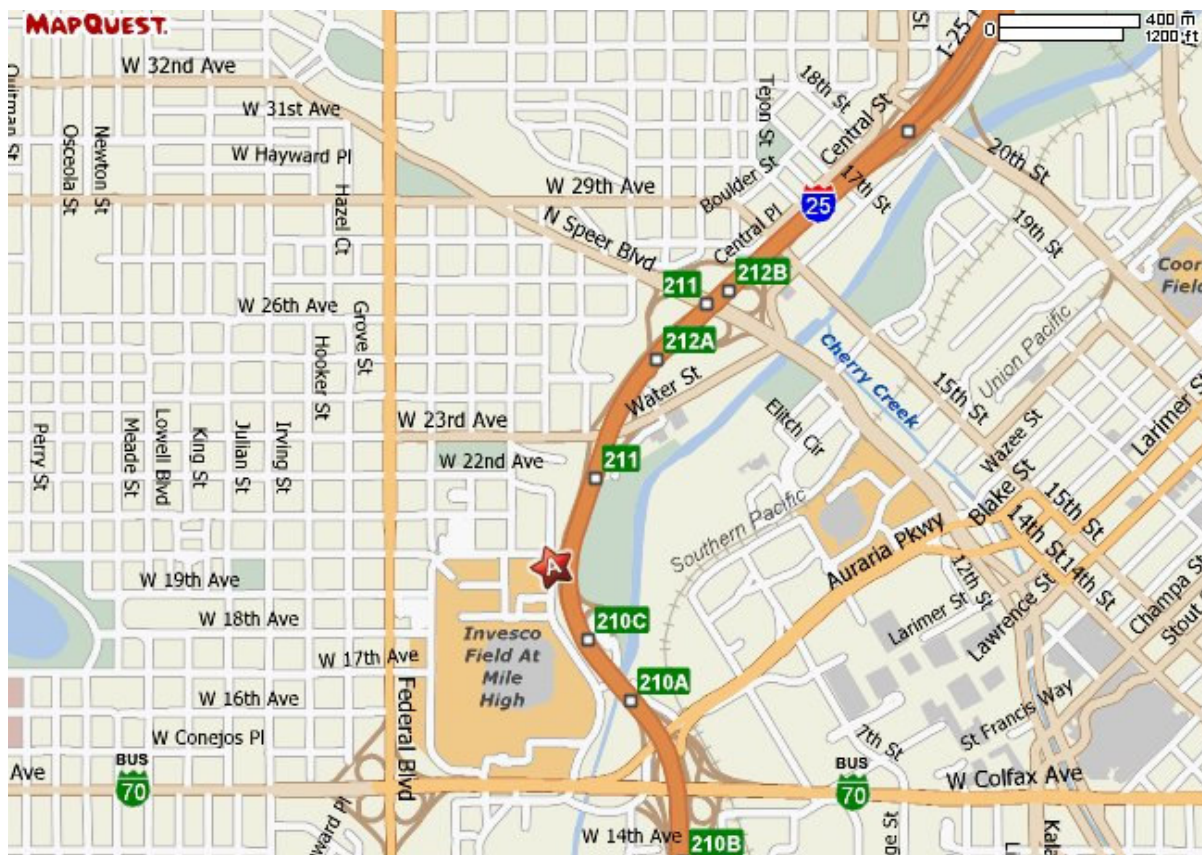
*The Rocky Mountain District of AIChE generally meets the third Tuesday of every month, September through November and January through May.*

Rocky Mountain AIChE News  
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On the Web at:

<http://www.aiche.org/rockymtn>

*Send your E-MAIL address to  
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this newsletter electronically!*



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High Stadium  
Circle, Denver  
CO 80204

Northbound  
on I-25, take  
exit 210B  
toward 17th.  
Turn right at  
Bryant Street  
and look for  
destination on  
right.

Southbound  
on I-25, take  
the US85/US6  
exit, then a  
slight left at  
Bryant St. and  
look for  
destination on  
the left.