



American Institute of Chemical Engineers Knoxville-Oak Ridge Section

Inside this issue

- April 2013 Meeting
- Tetra Tech Hiring Process Engineers
- Bio for Dr. Robert Hatcher
- Preview of Upcoming May Meeting
- Southern Appalachian Science and Engineering Fair – 2013
- Thank-You for Your Service to AIChE
- Recap of March Meeting – ORNL Advanced Manufacturing: The Future of Carbon Fiber
- Energy Department Launches New Clean Energy Manufacturing Initiative
- UT Student Awards Dinner Announcement
- Activities Calendar
- Sponsoring Opportunities
- Officers
- About Our Organization – AIChE's Young Apprentice Program

For additional information see our Web site at: <http://www.ornl.gov/sci/aiche/>
Or contact: Paula George, georgepm@ornl.gov, (865)576-0603 or
Rita Gray, rgray22@utk.edu, (865)974-5356

April 2013 Meeting

Date: Thursday, April 18, 2013
Cost: \$20

Location: Rothchild Catering and Conference Center, 8807 Kingston Pike, Knoxville TN
Menu: Menu items

5:30 pm Executive Committee Meeting (All members welcome)
6:00 pm Dinner
7:00 pm Program – Dr. Robert Hatcher, University of Tennessee Department of Earth and Planetary Sciences, *Oil and Gas Resources in Tennessee*

Abstract – The Tennessee oil and gas industry produces <1 million barrels of oil/yr and similar small amounts of natural gas. Despite the small size of the industry, a number of people make their livings from it. The principal oil and gas producing area has been Overton, Pickett, Fentress, Morgan, and Campbell Counties, with a field in Hancock County. Other regions remain underexplored, however, so the future for production in Tennessee is promising. Hydrocarbons in Tennessee originate in three “petroleum systems:” sedimentary rock sequences that contain a source, pathways for hydrocarbon migration, and traps where hydrocarbons may survive for long periods of geologic time. The oldest system involves an algal source in carbonate rocks with traps in younger limestone. The second involves a source in the organic-rich Chattanooga Shale (Marcellus equivalent) and traps in still younger crinoid reefs and limestone. The third system is the coal-bearing rocks of the Plateau, which produce no oil and noncommercial amounts of methane. The two primary petroleum systems provide four current options for exploration: conventional vertical drilling into the (1) older or (2) younger limestones, and horizontal drilling and fracking of the (3) Chattanooga Shale or the (4) crinoid reefs just above it. Horizontal drilling and fracking are options for all potential exploration targets. While the greater depths of production targets in West Virginia and Pennsylvania require fracking using liquids, shallower targets in Tennessee and southern Kentucky permit fracking with nitrogen, which lessens the chance of groundwater contamination. Primary sources of fracking-related contamination arise from: poor handling of liquids on the surface, and poor cementing of casings (leaving cracks or voids). Fractures propagate only short distances from fracked regions in horizontal drill holes. Most of the demonstrations of flaming gas from water faucets sensationalized by the media have been shown using stable isotope studies to have near-surface origins from organic matter, not deep hydrocarbons.

Bio – See page 2.

**Please make your reservations no later than noon on
April 17th by contacting**

Paula George, georgepm@ornl.gov, (865)576-0603 or
Rita Gray, rgray22@utk.edu, (865)974-5356

**The Section will subsidize up to 15 students,
including graduate students**



(Heat exchanger cooling system at Sandia National Laboratory – Courtesy of DOE Digital Photo Archive: <http://www.doedigitalarchive.doe.gov/enter.cfm>)

“A journey of a thousand miles begins with a single step.”

Lao Tzu
Ancient Chinese Philosopher

Bio for Dr. Robert Hatcher

Dr. Robert Hatcher is a Distinguished Scientist and Professor in the Department of Earth and Planetary Sciences at the University of Tennessee. His research goal is to gain a better understanding of the evolution of continental crust, mostly through the study of mountain chains and mature crust. While Dr. Hatcher is a structural geologist, most of his research is interdisciplinary, integrating stratigraphic, geochronologic, geochemical, and geophysical data into structural studies. He is primarily a field geologist, however, and field data form the basis for all other supporting studies. Dr Hatcher graduated with a B.A from Vanderbilt University in 1961 and with a Ph. D. from the University of Tennessee in 1965. He has previously worked at Humble Oil and Refining Company (1965–66), Clemson University (1966-78, Assistant Professor to Full Professor), Florida State University (1978-80, Full Professor), University of South Carolina (1980-86, Full Professor), and University of Tennessee-Knoxville and Oak Ridge National Laboratory Distinguished Scientist (1986–2000). He is the author or co-author of >200 scientific publications, including 9 books.

Tetra Tech Hiring Process Engineers

The Oak Ridge, TN office of Tetra Tech, Inc. has opportunities for process engineers to perform a variety of engineering calculations for the design of a one of a kind processing facility. As detailed design ramps up, engineers are needed with experience in performing design analysis, equipment sizing calculations, and safety calculations, as well as the writing of equipment specifications and data sheets. Applicants must have good communication skills and be capable of writing concise technical reports as well as performing calculations. Engineers with 5 to 15 years of experience and more senior engineers are needed.

The disciplines being considered are Mechanical, Chemical, and Nuclear Engineering. The minimum requirement for these positions is a BS in Engineering, while an MS is also appropriate. Use of MathCAD is a requirement along with a good understanding of the Microsoft Office Suite. Interested engineers are asked to submit a cover letter and resume to Janice.Hensley@TetraTech.com.



Preview of Upcoming May Meeting

Dr. Jan Simek will present a talk on ancient cave paintings at the McClung Museum on the UT campus. Dr. Simek is an American archaeologist and educator and was the interim president of the University of Tennessee from 2009-2010. As a faculty member in the department of anthropology at the University of Tennessee, Knoxville, his research interests include Paleolithic archaeology, human evolution, quantitative analysis, spatial analysis, archaeology of the southeastern United States, and cave archaeology. He has been involved in the discovery and exploration of numerous “Unnamed Caves”, a naming practice used to protect their location, in the Cumberland Plateau for the past fifteen years. He has been instrumental in the discovery of prehistoric artwork; dating back thousands of years and has also conducted important research in France at Neanderthal habitation sites.

Southern Appalachian Science and Engineering Fair - 2013

Knoxville-Oak Ridge AIChE section members, Paul Taylor and Mark Swientoniewski, selected the senior and junior division winners for the best chemical engineering related projects at the 2013 Southern Appalachian Science and Engineering Fair on April 2nd.

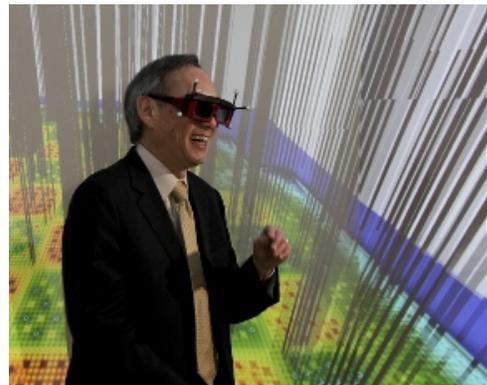
The junior division winner was Grace Santodonato of St Mary's School in Oak Ridge for her project "How Low Can You Glow". Grace studied the effect of temperature on the length of time that glow sticks continue glowing. Grace quantitatively measured the time the glow stick lasted and qualitatively determined the brightness at three different temperatures. She performed three replicates of each test condition and determined an Arrhenius type constant that related glow time to temperature.

The senior division winner was Brennan Davis of Morristown-Hamblen High School East for his project "Strategic Application of Hyperaccumulating Macroalgae for Heavy Metal Removal from Marine Environments". Brennan measured the uptake of three metals in a marine-algae. He developed a low cost method of measuring the metal concentrations left in solution and determined the concentrations over time after weighed amounts of algae were added to each solution. The metals concentrations in the

solutions were below detection levels after a couple of days.

The grand champion winners were "In a Fog" by Daniel Mountain of St Mary's School in the junior division and "Filamentous Fungi Cultivation on Moonshine Distillate Residues and Thin Stillage to Produce Reusable Water and a High-Value Fish Food Co-Product" by Sydney Burchell and John Hale of Morristown-Hamblen High School East. It appears that St Mary's and Morristown-Hamblen are doing a very good job in their science programs.

(Article courtesy of Paul Taylor)



(Former Secretary of Energy, Steven Chu views simulated reactor core at ORNL's Consortium for Advanced Simulation of Light Water Reactors (CASL) – Courtesy of DOE Digital Photo Archive: <http://www.doedigitalarchive.doe.gov/enter.cfm>)

"If you think you can do a thing or think you can't do a thing, you're right."

Henry Ford
American businessman
1863-1947

Thank-You for Your Service to AIChE

Linda Puckett has decided to retire after many years of loyal service to the Knoxville-Oak Ridge Section of AIChE. Over the years, Linda provided administrative support in the review and distribution of our monthly newsletter, compilation of attendees for our meetings, distribution of various mailers, and sent out hundreds of meeting reminders. We thank her for her service and congratulate and wish her well in retirement. In Linda's absence, Paula George has agreed to assist with our administrative needs. We appreciate Paula's willingness to assist the local section.

Recap of March Meeting – ORNL Advanced Manufacturing: The Future of Carbon Fiber

The Knoxville-Oak Ridge AIChE section March meeting was held jointly with American Society for Materials and included an excellent overview of the Carbon Manufacturing Facility in Oak Ridge by Ms. Lee McGetrick of Oak Ridge National Laboratory. Her presentation included a summary of origins of the innovative carbon fiber manufacturing facility, its capabilities, and the outlook for the carbon fiber industry. A number of commercial entities have partnered with the facility and others have expressed interest in demonstrating various production methodologies at this versatile manufacturing facility. Ms. McGetrick also discussed several approaches to carbon fiber manufacturing, including current research and possible feedstocks and processes used in the production process. (See follow-up story below)



Ms. Lee McGetrick presenting an overview of the carbon manufacturing facility at the March meeting of the Knoxville-Oak Ridge Section of AIChE.

Energy Department Launches New Clean Energy Manufacturing Initiative

DOE Awards \$23 Million in Innovative Manufacturing R&D Projects, Opens Nation's First Carbon Fiber Manufacturing Research Facility in Oak Ridge, Tennessee

As part of the Obama Administration's commitment to revitalizing America's manufacturing sector, today the Energy Department launched the Clean Energy Manufacturing Initiative (CEMI), a new Department initiative focused on growing American manufacturing of clean energy products and boosting U.S. competitiveness through major improvements in manufacturing energy productivity. The initiative includes private sector partnerships, new funding from the Department, and enhanced analysis of the clean energy manufacturing supply chain that will guide the Department's future funding decisions.

"We are at a critical moment in the history of energy in our nation. Over just the last seven years, global investment in the clean energy sector has grown nearly five-fold to over \$260 billion and these markets will grow into the trillions of dollars

in the years to come," said Assistant Secretary for Energy Efficiency and Renewable Energy David Danielson. "Our nation faces a stark choice: the energy technologies of the future can be developed and manufactured in America for export around the world, or we can cede global leadership and import these technologies from other nations. As part of President Obama's plan to

(Continued on page 4) revitalize American manufacturing, the Clean Energy Manufacturing Initiative will seize this opportunity to ensure U.S. leadership in the clean energy sector and advance the global competitiveness of American manufacturers."

The announcement was made at the ribbon cutting of the Department's Carbon Fiber Technology Facility in Oak Ridge, Tennessee, a new advanced manufacturing facility to reduce the cost of carbon fiber - a critical material for efficient lightweight vehicles, next generation wind turbines, and a wide array of other consumer and industrial products.



(Foreground, from left) DOE Assistant Secretary David Danielson joined Congressman Chuck Fleischmann, Council on Competitiveness CEO Deborah Wince-Smith and Gov. Bill Haslam for the dedication of DOE's Carbon Fiber Technology Facility at Oak Ridge National Laboratory.

See the full Department of Energy press release at <http://energy.gov/articles/energy-department-launches-new-clean-energy-manufacturing-initiative>.

Video of the dedication ceremony is available at http://www.ornl.gov/ornlhome/CFTF_Ceremony.shtml— [Morgan McCorkle](#), March 26, 2013

(Source: http://www.ornl.gov/info/features/get_feature.cfm?FeatureNumber=f20130326-00)

UT Student Awards Dinner

Please join us for

The 2013 Chemical and Biomolecular Engineering Awards Dinner

Thursday, April 25, 2013

6:00 pm- Cash Bar in CBE Banquet Area

6:30 pm Program

Calhoun's on the River
400 Neyland Drive
Knoxville, Tennessee

AICHE Members: \$20 at the Door

Menu

Grilled Chicken Teriyaki Served over Rice
Hickory Smoked Pulled Pork with BBQ Sauce
Sautéed Mixed Vegetables
Spinach Maria
Stuffed Baked Potatoes
Double Chocolate Cake
Italian Cream Cake

RSVP to Rita Gray (rgray22@utk.edu)
by
Thursday, April 18, 2013



Activities Calendar

Date	Time	Topic	Speaker	Location
Apr 18	6:00 PM	Oil and Gas Resources in Tennessee	Dr. Robert Hatcher - UT	Rothchild's, Knoxville TN
Apr 25	6:30 PM	UT Chemical and Biomolecular Engineering Department Awards Dinner	Student Presentations	Calhoun's on the River
May 16	6:00 PM	Ancient Cave Paintings	Jan Simek - UT	McClung Museum
August	TBD	Executive Committee Planning Meeting		

Sponsoring Opportunities

We continue to accept advertising in the newsletter in order to provide funds to support student participation in the meetings.

Rates per newsletter are:

\$80 full-page advertisement

\$45 half-page advertisement

\$25 quarter-page advertisement

The section will also continue to accept individual or corporate sponsors to provide student meals at section meetings. The sponsor will be recognized at the meeting and in the Newsletter.

The cost to sponsor one meeting is **\$200**. It's a great way to encourage students to attend the local meetings and become future members in the Institute!



(Glass bioreactor and anaerobic chamber at Lawrence Berkley National Laboratory - Courtesy of DOE ORNL Photo Archive: <http://www.ornl.gov/ornlhome/photos.shtml>)

"I'm a great believer in luck, and I find the harder I work, the more I have of it."

Officers

Chair:	Jarrold Clark	259-6552	jarrod.clark@merrick.com
Chair-Elect:	Bonnie LaPierre	241-6521	lapierrebl@y12.doe.gov
Secretary:	David DePaoli	574-6817	depaolidw@ornl.gov
Treasurer:	Paul Taylor	574-1965	taylorpa@ornl.gov
Directors:	Michael Aident	694-7333	Michael.Aident@shawgrp.com
Term ends 2014	Stuart Daw	946-1341	dawcs@ornl.gov
Term ends 2014	Chris McBride	692-8662	cemcbride@focusenv.com
Term ends 2013	Thomas Busmann	453-3538	tbusmann@focusenv.com
Term ends 2013	Kyle Mack	(423)747-7947	kylematthewmack@gmail.com
Membership:	Paul Taylor	574-1965	taylorpa@ornl.gov
Newsletter:	Paula George	576-0603	georgepm@ornl.gov
Editor/Webmaster:	Ben Lewis	574-4091	lewisbejr@ornl.gov
E-mail:			aiche-chat@chem.engr.utk.edu
Website			http://www.ornl.gov/aiche

Thomas Jefferson
*Founding Father and
 3rd President of the United States
 1743-1826*

Knoxville - Oak Ridge Section

P.O. Box 2008
Bldg. 7920, Room 5
Oak Ridge, TN 37831-6384

Phone: 574-6147
Fax: 574-6872

E-Mail: [aiche-
chat@chem.engr.utk.edu](mailto:aiche-chat@chem.engr.utk.edu)



We're on the Web!

See us at:

<http://www.ornl.gov/sci/aiche/>

Editor: B. Lewis

About Our Organization – AIChE's Young Apprentice Program

If you are a young professional under the age of 35 and are willing to assume a leadership role in AIChE (on a project of your choice), the AIChE Foundation, through its Young Professionals Apprentice program (CEP, Sept. 2012, p. 72), will subsidize your dues for 2.75 years. The subsidy is 100% in the first two years and 75% in the third year.

The apprenticeship program is an opportunity for young professionals to develop leadership skills in the context of their careers as chemical engineers and members of AIChE. Participants join the program for three years and are encouraged and empowered to create or contribute to large projects related to chemical engineering and the world around them.

The Program

Apprentices will:

- Create or Select a project of importance to them and the chemical engineering discipline.
- Execute or Contribute to that project in

substantial ways over a period of three years.

- Choose a Coach or Advisor within the Institute and work with them to develop the Apprentice's career professionally, socially, and philanthropically.
- Meet with other Apprentices locally or at conferences.
- Write about their experiences as an Apprentice on ChEnected as blog posts, video interviews, and newsletters.
- Receive subsidized membership during their three years in the program if they fulfill all program requirements.

Selection

Apprentices will be selected by:

- Self-selection – Interested applicants can email Arjun Gopalratnam (arjug@aiche.org) to join the program.

- Nomination – Please visit the [Nominations form](#) to nominate an Apprentice.

Timeline

The program consists of monthly check points to help guide the Apprentices during their three year term. Apprentices are invited to join at any time and will begin the program in groups of 5-10.

Contact

For more information about the program, please email Arjun Gopalratnam (arjug@aiche.org).

(Source: AIChE website <http://www.aiche.org/community/young-professionals#apprentice>)

P.O. BOX 2008
BLDG. 4500N, ROOM B-12
OAK RIDGE, TN 37831-6243

