



# American Institute of Chemical Engineers

## Knoxville-Oak Ridge Section

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

## November 2015 Meeting

Date: Thursday, November 19, 2015  
Cost: \$20  
Location: Rothchild Catering and Conference Center, 8807 Kingston Pike, Knoxville TN  
5:30 pm Executive Committee Meeting (All members welcome)  
6:00 pm Dinner – Menu  
7:00 pm Program – Dr. Brian Davison, Oak Ridge National Laboratory, **Cellulosic Biofuels: Continued Research Challenges During Pioneer Biorefinery Deployment**

**Abstract** – First generation cellulosic biofuel processes are under development. Although biofuels production has the same key requirements as other existing energy supply chains, biofuels are a unique multi-factorial problem. Consideration must be given to the land used for feedstock production, the feedstocks employed (e.g., dedicated energy crops), the process technologies used (e.g., thermochemical conversion, fermentation), and the products.

In bioenergy, there is a need to accelerate the development and adoption of second and third generation technologies for production and conversion while the first generation technologies are being deployed in several pioneer biorefineries. Modern biotechnology has the potential to impact many aspects of the biomass supply chain. For example, technological advances in feedstock production (e.g., enhancing crop yield by genetic modification or selection of specific natural variants) and process technologies (e.g., development of advanced enzymes or bacteria for the conversion of biomass) will impact future costs of possible biofuel supply chains. Other biotechnological advances may increase the production of fungible biofuels and bioproducts. I will discuss the bioenergy drivers and the biological approaches being taken to address them as well as outline potential game-changers. (Continued on page 2)

**Bio** – Brian H. Davison is Chief Scientist for Systems Biology and Biotechnology, Oak Ridge National Laboratory. He is the Science Coordinator in the DOE Bioenergy Science Center ([www.bioenergycenter.org](http://www.bioenergycenter.org)). (Continued on page 2)

**Please make your reservations by noon, November 18, by contacting**  
Paula George, [georgepm@ornl.gov](mailto:georgepm@ornl.gov), (865)576-0603 or  
Rita Gray, [rgray22@utk.edu](mailto:rgray22@utk.edu), (865)974-5356

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

## November 2015 Meeting (continued)

**Abstract** (continued) - However, recalcitrance, or overcoming the inability to easily access the sugars from lignocellulose to make fuels or products, is one of the major challenges for cost-effective biofuel production. The primary goal of the Department of Energy-funded BioEnergy Science Center (BESC) is to enable the emergence of a sustainable cellulosic biofuels industry by leading advances in science and innovation resulting in removal of recalcitrance as an economic barrier ([www.bioenergycenter.org](http://www.bioenergycenter.org)). BESC is focusing on two hypotheses. First, that this one-step, game-changing strategy can be improved by engineered microbe especially using consolidated bioprocessing. Second, that new biofeedstocks with lowered recalcitrance can be developed.

**Bio** (continued) - He is an Adjunct Professor of Chemical Engineering and in the Bredesen Center faculty at the University of Tennessee-Knoxville. He served as the Director of Life Sciences Division at ORNL (2004-2005). In his thirty years at ORNL he has performed biotechnology research including bioconversion of renewable resources (ethanol, organic acids, solvents), non-aqueous biocatalysis, extractive fermentations, biomass conversion and characterization, and catalytic upgrading of ethanol into fuels. He has over 140 publications and nine patents. He received his Ph.D. in Chemical Engineering from the California Institute of Technology, and his B.S.E. in Chemical Engineering, from the University of Rochester.

He led a multilab team which received an R&D100 Award in 1997 for "Production of Chemicals from Biologically Derived Succinic Acid," a process now in commercialization. He was the ORNL Science Communicator of 2010 at ORNL for efforts in bioenergy and education. He co-chaired the 15th to 26th Symposia on Biotechnology for Fuels and Chemicals, and served as editor of the Proceedings. He received the 2006 C.D. Scott award by the Society of Industrial Microbiology. He is on the Board of the Society for Biological Engineering and the Editorial Board of the Journal of Industrial Biotechnology.

## Election of Local Section Officers

In accordance with the Knoxville-Oak Ridge Section of the AIChE By-Laws (<http://web.ornl.gov/sci/aiche/bylaws.html>), officers and directors are to be elected every year. Officers serve a 1 year term whereas the directors serve for 2 years.

The local section is looking for members in good standing that may be interested in volunteering for any of the following officer/director positions.

- Chair Elect (the previous Chair Elect automatically assumes the Chair position).
- Secretary
- Treasurer
- Directors (2)

We encourage anyone who would like to become more active in the

local Section to run for an office. If you have questions about the level of commitment, job duties, or would like to include your name as a candidate for an office, please contact any of the Section officers at the email addresses and/or phone numbers posted on page 5.

Once engaged in the Section meetings we are sure that you will agree that we have a great group of people who all work together to provide the Section with informative programs and opportunities. If you are unsure as to whether you can make all the meetings or cannot commit to being on the Board, we encourage you to still attend the Board meetings (typically beginning at 5:30, just before the scheduled Section meeting) and meet other members and share your ideas.

Board meetings are open to all members. Attending a board meeting is a good way to get a feel for the workings of the Section and to see firsthand the level of commitment and involvement required (actually very little) of the Section Officers. We routinely have several members participate in the board meetings although not an elected officer or director. If for no other reason, attending local Section meetings is a good way to network with other Chemical Engineers in the area.

(Excerpt from, Michael Aident, *Election of Local Section Officers*, American Institute of Chemical Engineers, Knoxville-Oak Ridge Section, October 2013, Vol. 66, Issue 7)

## Why I joined the AIChE

The following reprint is from the December 2010 Newsletter article, *Members Forum – Testimonials on the Benefits of Membership*, written by the current Chair Elect, Mark Swientoniewski. Mark is a Senior Process Engineer with Bechtel National Inc. where he is an Engineering Design Team member for the Y-12 Uranium Processing Facility.

“I joined AIChE as a chemical engineering college student at Virginia Tech. My classmates convinced a group of us that the first benefit of AIChE membership would be attending the AIChE national meeting to be held in a large southern city with beach access. Student attendance at the national meeting was going to be inexpensive including a subsidy from the Chemical Engineering Department. Of course, continuing education was our stated goal, but a big party in our spare time was the hidden agenda. Then reality set in, and one of those career defining moments occurred. In those good old days, most of us had accepted our employment offers during winter and early spring. My future employer was a subsidiary of the Dow Chemical Company in Knoxville Tennessee. I was going to be working as a consulting engineer while most of the others had accepted offers to perform plant engineering at chemical and oil companies. Unlucky for me, the first half of the Professional Engineer's Exam was scheduled at the same

time as the AIChE national meeting. I knew that a Professional Engineer's License would be an important career boost. I took and passed the Engineer-In-Training Exam. My friends let me know of the good time I missed. So the very first AIChE membership benefit was a good one that was not taken.

I have always taken advantage of the AIChE Insurance Program benefits. I have found them to be a good value compared with employer benefits. Through my working years, as my employment circumstances have changed the AIChE benefits were a constant reliable backstop.

I have enjoyed the local AIChE section meetings for two good reasons. The Professional Development Hour credits for continuing education needed to maintain my PE License and networking with other high performing professionals. The contact with local engineers has led to business relationships as well as enduring personal friendships. In today's tough job market, it is gratifying to know of at least a few people who might know someone who may present you with an unexpected opportunity.

In my later career years, I have become more involved with the local AIChE section as an Executive Officer including a year as the President. I have enjoyed the challenges of arranging speakers to


present their technical work and have given my own technical presentation to practice my public speaking skills. I especially enjoy encouraging young people to take up the study of the sciences and mathematics. I like to encourage the talented local section members to offer their talents to teach young people and to offer to be judges at local science fairs. I am especially encouraged by the attendance of high school and college students at our monthly meetings. Talking with enthusiastic science fare students about their work and presenting them with unexpected cash prizes has been gratifying. I have taken advantage of the especially deep technical experience of some of our local retired section members. Their knowledge and wisdom is so valuable to learn from and is freely available by just engaging in a conversation. Their fundamental understanding of the 'way things work' is never sidetracked with a concept discussion of new technology versus old technology. When presented with risk it is comforting to start with what works. I challenge local section members to develop a habit of engaging our well experienced engineers in a discussion of their life experiences.”

## December 10 Meeting Preview – “Feel the Power of the Dork Side” Pete Ludovice, Georgia Institute of Technology

“Feel the Power of the Dork Side” is a hilarious and educational look at science & technology, and their practitioners. Written and performed by Pete Ludovice, the world’s only chemical engineering professor by day and stand-up comedian by night, it will prove that nerds can be funny, and not just funny-looking. [www.drpetecomedy.com](http://www.drpetecomedy.com)

The world’s only touring comedian with a Ph.D. from M.I.T., Pete has performed internationally as a comedian for over a decade, and taught Georgia Tech Chemical Engineers for over two decades. His research activities include the computer modeling of synthetic and biological macromolecules, and the use of humor to improve technical innovation, communication, and education ([ludovice.chbe.gatech.edu](http://ludovice.chbe.gatech.edu)). One of his National Science Foundation projects examines the use of humor in engineering education. He co-directs the Humor Genome Project ([humorgenome.org](http://humorgenome.org)) and the Geekapalooza Comedy Tour ([pwp.gatech.edu/geekapalooza](http://pwp.gatech.edu/geekapalooza)) at Georgia Tech. Pete also hosts "Inside the Black Box," a weekly radio show on science and technology whose motto is “Science, only funnier” (WREK-Atlanta, 91.1FM, [insidetheblackbox.org](http://insidetheblackbox.org)), and a podcast on the intersection of science and the humanities ([www.peteandcharlie.libsyn.com/](http://www.peteandcharlie.libsyn.com/)).

FEEL THE POWER  
OF THE DORK SIDE



“Dr. Pete’s one-man show is part stand-up, part song, and all incredibly smart.”

New Orleans Defender

N	NORMAL PEOPLE	
THIS EVENT IS SUITABLE FOR PEOPLE WITH A TECHNICAL DEGREE, AND FOR PEOPLE WITHOUT ONE (NORMAL PEOPLE)		

Bio: After completing a Ph.D. in chemical engineering at MIT, Pete Ludovice did postdoctoral research at IBM, NASA, and the Eidgenossische Technische Hochschule-Zurich. He joined the chemical & biomolecular engineering faculty at Georgia Tech after managing the polymer products group for Molecular Simulation Inc. (now Accelrys). Pete is currently the director of the Center for Academic Enrichment at Georgia Tech. He has given numerous seminars and workshops for AIChE and other technical organizations on the application of molecular simulation and the use of humorous improvisation to enhance technical innovation.

## Activities Calendar

Date	Time	Topic	Speaker	Location
Nov 19	6:00 PM	Cellulosic Biofuels: Continued Research Challenges During Pioneer Biorefinery Deployment	Brian Davison, ORNL	Rothchild's, Knoxville TN
Dec 10	6:00 PM	Feel the Power of the Dork Side: A Humorous and Educational Look at Science and Engineering and Their Practitioners – Joint with SWE	Pete Ludovice, GA Tech	Rothchild's, Knoxville TN
Jan 21	6:00 PM	Critical Materials Institute	Bruce Moyer, ORNL	Rothchild's, Knoxville TN
Feb XX	6:00 PM	Joint with ANS - TBD	TBD	TBD
Mar 10	6:00 PM	Joint meeting with UT – Urban Forestry Program	Kasey Krouse	UT Ag Campus
Apr 14	6:00 PM	Energy Choices and Consequences	Harold "Lee" Dobbs, UT	Rothchild's, Knoxville TN
Apr XX		UT Department of Chemical & Biomolecular Engineering Awards Banquet		TBD
May 12	6:00 PM	Super Hydrophobic Coatings	TBD	Rothchild's, Knoxville TN

## 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

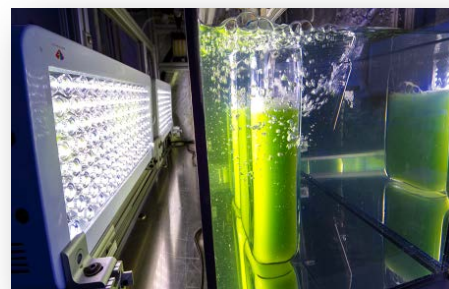
**\$45** half-page advertisement

**\$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!



(Biofuels research at Los Alamo National Laboratory- Courtesy of DOE Digital Photo Archive, <https://www.flickr.com/photos/brightsourceenergy/8720323711/in/faves-departmentofenergy/>)

*"Don't sit down and wait for the opportunities to come, you have to get up and make them."*

## Officers

<b>Chair:</b>	Kyle Mack	(423)747-7947	<a href="mailto:kylematthewmack@gmail.com">kylematthewmack@gmail.com</a>
<b>Chair-Elect:</b>	Mark Swintoniewski	574-1150	<a href="mailto:swintoniem1@y12.doe.gov">swintoniem1@y12.doe.gov</a>
<b>Secretary:</b>	David DePaoli	574-6817	<a href="mailto:depaolidw@ornl.gov">depaolidw@ornl.gov</a>
<b>Treasurer:</b>	Paul Taylor	574-1965	<a href="mailto:taylorpa@ornl.gov">taylorpa@ornl.gov</a>
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<b>Website</b>			<a href="http://www.ornl.gov/aiche">http://www.ornl.gov/aiche</a>

**Madam C. J. Walker**  
African American entrepreneur,  
philanthropist, and the first female  
self-made millionaire in America  
1867-1919

## Knoxville - Oak Ridge Section

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We're on the Web!

See us at:

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

Editor: B. Lewis

## About Our Organization...Committees

AIChE has 23 committees that function as national liaisons between the Board of Directors and the Institute's membership. Each committee addresses and serves specific fields within the organization and help shape the policy and procedure of the Institute. They serve as forums for the initiation and discussion of ideas, activities, and programs that serve the members and keep the Institute responsive to the members' needs.

Membership in a committee is often made through invitation or appointment. Committees include the following:

[Admissions Committee](#)

[Audit Committee](#)

[Awards Committee](#)

[Board of Directors  
Awards Committee](#)

[Constitution & By-Laws  
Committee](#)

[Continuing Education  
Committee \(CEC\)](#)

[Council of Division &  
Forum Officers](#)

[Education & Accreditation  
Committee](#)

[Equipment Testing  
Procedures Committee](#)

[Ethics Committee](#)

[Executive Committee](#)

[Executive Student  
Committee \(ESC\)](#)

[Finance Committee](#)

[International Committee](#)

[Local Sections Committee  
\(LSC\)](#)

[Membership Committee](#)

[Minority Affairs  
Committee \(MAC\)](#)

[Nominating Committee](#)

[Program Committee \(PC\)](#)

[Public Affairs &  
Information Committee  
\(PAIC\)](#)

[Publication Committee](#)

[Research & New  
Technology Committee  
\(RANTC\)](#)

[Student Chapters  
Committee](#)

[Technician's Affairs  
Committee](#)

[Women's Initiatives  
Committee \(WIC\)](#)

[Young Professionals  
Committee \(YPC\)](#)

(Source:  
<http://www.aiche.org/community/committees>)

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