



## American Institute of Chemical Engineers Knoxville-Oak Ridge Section

For additional information see our Web site at: <http://www.ornl.gov/sci/aiche/>  
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## September 2016 Meeting

**Date:** Thursday, September 22, 2016  
**Cost:** \$20 (Cash or Check - **NOTE:** There is no cost for the program or PDH Certificate)  
**Location:** Rothchild Catering and Conference Center, 8807 Kingston Pike, Knoxville TN

5:00 pm Executive Committee Meeting (All members welcome)  
5:30 pm Social/Networking  
6:00 pm Dinner  
7:00 pm Program – Dr. Lonnie Love – Corporate Fellow and Group Leader of Oak Ridge National Laboratory's Manufacturing Systems Research Group, ***Creating Disruptions in Automotive Manufacturing***

**Abstract** – Conventional automotive manufacturing has experienced a number of disruptions. First was Henry Ford's advent of the assembly line which introduced the efficiencies of mass production. In the 1970's and 80's, the automotive industry began integrating robotics into the assembly line which increased quality control and flexibility. Could we be seeing the advent of a new disruption in automotive manufacturing with the advent of the 3D printed car? Traditional 3D printing has been limited to small size, low production rate systems that could have an impact on components but have never been considered for mass production. The introduction of Big Area Additive Manufacturing (BAAM) is leading to new paradigms in automotive production. What happens if a car can be reduced from requiring the assembly of 20,000 parts down to under 100 parts? What happens if a single printer can print the majority of the part in less than 8 hours? Is the future of automotive manufacturing based on a decentralized model where car dealerships can make cars? (Continued on page 2)

**Please make your reservations by noon September 20 by contacting**

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

**The Executive Committee of the Knoxville – Oak Ridge Section of the AIChE would like to thank our corporate host and sponsor for our summer planning meeting for the 2016/2017 year.**



Thanks to Focus Environmental, Inc. for providing their Papermill Drive office conference room for our planning meeting.

## September 2016 Meeting (Continuation from page 1)

Abstract (continued) – What are the major research hurdles in terms of materials and design? This talk will describe recent work at ORNL in terms of manufacturing and the impact it could have on the future of automotive manufacturing.

Bio – Lonnie Love, Ph.D., is a Corporate Fellow and Group Leader of Oak Ridge National Laboratory's Manufacturing Systems Research Group. He received his Ph. D. in Mechanical Engineering from the Georgia Institute of Technology in 1995. He is the project lead for the Big Area Additive Manufacturing (BAAM) program at ORNL that is focusing on large scale, high speed composite additive manufacturing that is now being commercialized by Cincinnati Incorporated. His team has demonstrated the technology on a number of high profile projects including the first 3D printed car (the Strati with Local Motors), the printed Cobra for the Department of Energy as well as high speed, low cost tooling for Boeing and Ford. Lonnie was ORNL's 2014 Distinguished Research Scientist, 2009 Inventor of the year, has over 30 invention disclosures and patents and 125 peer reviewed publications. He serves on the scientific advisory board for NSF's Center for Compact and Efficient Fluid Power.



## Survey Results

The results are in and analyzed, and your voices have been heard. As a result of your input, the Knoxville-Oak Ridge Section of AIChE will implement the following changes in the coming year:

1.) Different food will be provided during the non-catered venues. BBQ was the preferred option over the normal pizza.

2.) There are no scheduled museum topics this year.

3.) Additional focus will be placed on student outreach. We are planning a student meeting to assist their

preparation for the regional conference in the spring, as well as planning a joint meeting with the student chapter. We are hoping these changes work well and are successful to engage the future professionals in our industry.

Full survey results can be found at: <https://www.surveymonkey.com/results/SM-3R3LWRWM/>. Note some detail is not available in the free version of *SurveyMonkey* that was used for the survey.

(Article courtesy of Kyle Mack)

## Local Section Dues Increase

The executive committee for the Knoxville-Oak Ridge Section of AIChE has decided to increase the local section dues from \$15 to \$20 for the coming year. The dues have been at \$15 for many years, and the new \$20 rate is in the mid-range of what other Sections charge. The local dues help to pay for a number of awards and donations that support local student science and engineering activities. These include free dinners for students who attend our monthly meetings and awards for the ORAU-TN Science Bowl, the Southern Appalachian Science and Engineering Fair (SASEF), and two individual awards for University of Tennessee (UT) students for Outstanding Student and Outstanding Baccalaureate. We have also increased our level of support for SASEF and the UT student awards in recent years, and a dues increase will provide needed resources to sustain these donations.

(Article courtesy of Paul Taylor)



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## 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 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 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 at the end of the newsletter.

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.

(Reprint from, American Institute of Chemical Engineers, Knoxville-Oak Ridge Section, November 2015, Vol. 68, Issue 8)



## VOLUNTEER'S CORNER

Engineers making a difference in our community.

Date	Event
Anytime	<p>K-12 Outreach</p> <ul style="list-style-type: none"> <li>Teach Math or Science to a Middle/High Schooler? Junior Achievement, <a href="http://www.jaeasttennessee">www.jaeasttennessee</a></li> <li>AIChE Academy can deliver chemical engineering educational resources to help Chemical Engineering professionals connect, learn, and solve pressing challenges. Visit <a href="http://www.aiche.org/academy">www.aiche.org/academy</a> and see what AIChE Academy has to offer.</li> </ul>  <ul style="list-style-type: none"> <li>AIChE <a href="#">Young Professionals Committee</a>. We sponsor a competition for our collegiate student chapters, the <a href="#">Global Undergraduate Student Video Competition</a>. This competition requires chapters to create a video about a relevant chemical engineering subject that will be shown to high school students to teach them about that topic, and ultimately encourage them to study chemical engineering.</li> </ul>
Anytime	<p>AIChE K-OR needs help with:</p> <ul style="list-style-type: none"> <li>Social Media Committee – The local section desires to establish a presence on various social media outlets, such as: Facebook™, Twitter™, LinkedIn™, and YouTube™.</li> <li>Young Professionals Committee – The local section desires to establish a Young Professional's Group to increase participation and interactions with young chemical engineers within the East Tennessee region.</li> <li>Monthly Newsletter - Submit an Article, Editor-At-Large</li> <li>AIChE K-OR Webmaster</li> </ul>
Anytime	<p>Engineer's Without Borders – <a href="http://www.ewb-usa.org">http://www.ewb-usa.org</a></p>
Date	Event
January February 17-18, 2017	<p>Tennessee Science Bowl</p> <p>See <a href="http://www.ornl.gov/sciencebowl/volunteers/index.html">http://www.ornl.gov/sciencebowl/volunteers/index.html</a> for details.</p> 

February 18, 2017	<p>Boy Scouts Merit Badge College – Roane State Community College - <a href="#">Merit Badge College</a></p> <ul style="list-style-type: none"> <li>• Help teach the chemistry merit badge</li> </ul>
February 19-25, 2017	Engineer's Week – <a href="#">DiscoverE.org</a>
March 22 - 25 2017	TN FIRST Robotics See <a href="http://www.usfirst.org/community/volunteers">http://www.usfirst.org/community/volunteers</a>
March 31, 2017 – April 1, 2017	AIChE UT Student Chapter is hosting a regional meeting
March	Chem-E-Car Competition - AIChE's annual Chem-E-Car Competition® engages college students in designing and constructing a car powered by a chemical energy source, that will safely carry a specified load over a given distance and stop.
March 27-30, 2017	<p>Southern Appalachian Science &amp; Engineering Fair (SASEF) – UTK Thompson Boling Arena</p> <p>To register as a judge: <a href="http://sasef.com/">http://sasef.com/</a>. Select “Judges” and then “Register Online.”</p>
May June	<p><b>Volkswagen-Sponsored Camp Introduces Students to UT, Engineering</b></p> <p>With the Volkswagen-sponsored <a href="#">Engineering VOLunteers for Tenth Graders</a>, or eVOL10, now under way at the University of Tennessee, Knoxville, <a href="#">College of Engineering</a>, students in high school and middle school are getting a chance to take a deeper look into future possibilities in science, technology, engineering and mathematics, or STEM.</p>
July	AIChE K-OR Planning Meeting for the upcoming academic year needs ideas and help planning speakers and arranging meeting locations.
August	
September	
October	
November	
December	



## Prados Named Inaugural Member of UT Engineering Hall of Fame

The Department of Chemical and Biomedical Engineering at The University of Tennessee (UT) has roots dating over 100 years, to its beginning in 1905 as a part of the Department of Chemistry. To help honor and share this legacy, UT has established the Engineering Hall of Fame. Dr. John Prados, a UT vice president and University Professor emeritus, has been named the inaugural member of the hall for his sixty years of service to the department as a teacher, administrator, and university icon.

*"It is hard to find words to express my appreciation for this honor," said Prados. "Words like 'overwhelmed' and 'speechless' come to mind."*

*"I want to express my deep gratitude to the department for this recognition, because what I have accomplished over the past sixty years could not have happened without the help and support of my faculty colleagues, the departmental staff, and especially my students, and they all share in this honor."*

One of the oldest chemical engineering programs in the South, it became its own department in 1936, one year after starting its master's degree program. A doctoral path was created in 1949, the first such PhD offered by any institution in Tennessee, public or private.

Prados joined the department as a graduate assistant in 1953. He quickly climbed the ranks in both the department and the college, serving as a full-time faculty member from 1956 to 1968 before spending the next two decades in stints as associate dean of engineering, dean of admissions and records, acting chancellor of

the Knoxville and Martin campuses, acting director of energy conversion programs at the UT Space Institute, and, from 1973 through 1988, vice president for academic affairs of the statewide UT System.

*"The faculty in the department*



John Prados, right, stands with College of Engineering Dean Wayne Davis after his induction into the Chemical and Biomolecular Engineering Hall of Fame.

*wanted him to be the first and only person elected to our hall of fame in its inaugural year," said department head Bamin Khomami. "It's an acknowledgement of his standing in the field as well as his outstanding contributions to our program over many decades."*

Surprisingly enough, that long career at UT almost didn't happen. Prados said he'd planned to go into the petrochemical or petroleum industry on the Gulf Coast after finishing a two-year stint in the Air Force. But fate intervened when a faculty member suddenly left the department for an industry job, and then—department head Robert Boats offered Prados the job.

*"My career at UT was totally unplanned," said Prados. "I had enjoyed some part-time teaching while in graduate school, and although the pay was only about two-thirds of my industry offers, there were good possibilities for research support and consulting at Oak Ridge National Laboratory, so I took the job."*

*"Except for two periods of leave—one to work at ORNL and one with the National Science Foundation—I have been here ever since."*

He returned to the department full time in 1989, serving as its department head from 1990 to 1993.

A native of Spring Hill, Tennessee, Prados is a fellow of the American Institute of Chemical Engineers (AIChE), the Accreditation Board for Engineering and Technology (ABET), and the American Society for Engineering Education. He has received the L. E. Grinter Distinguished Service Award, UT's Macebearer Award, and the James T. Rogers Award from the Commission on Colleges.

In other higher learning institutions, Prados has been a member of the Board of Trustees of the Southern Association of Schools and Colleges, a trustee of the F. W. Olin College of Engineering, and an executive councilor of Tau Beta Pi as well as advising more than thirty other universities, government entities, and industries.

Outside academia, he has served as the National Science Foundation's senior education associate in its Engineering Directorate, as director and

## Prados Named Inaugural Member of UT Engineering Hall of Fame (continuation from page 6)

treasurer of the AIChE, president and treasurer of the scientific research society Sigma Xi, chair of the Engineering Accreditation Commission, and secretary and president of ABET.

To be considered for the Department of Chemical and Biomolecular Engineering Hall of Fame, a person needs to hold a degree from the department or a department at another college with a sustained relationship with UT, have a minimum of ten years of experience in engineering, have been recognized by peers or by honorary societies, and not be an active faculty member at UT.

**CONTACT:**

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(Article reprinted from Tennessee Today, May 24, 2016:

<http://tntoday.utk.edu/2016/05/24/prados-member-chemical-biomolecular-engineering-hall-fame/>)

## Professional Development Hour Certificates

Professional Development Hour (PDH) certificates have routinely been available to the attendees of our meetings. The informative technical seminars presented at each meeting provide attendees with 1 PDH of credit toward partial fulfillment of the continuing education requirements for licensure. PDH certificates will continue to be issued electronically based on a sign-in sheet that will be available at each meeting. PDH certificates will be issued by emailing a copy of the certificate to each requestor of record, according to the sign-in sheet.

## National Election of Officers Open

In addition to the election of local section officers (see article on page 3), online voting for the election of candidates for the national AIChE Board of Directors begins on Tuesday, September 6, 2016. This year, candidates for the President-Elect, Treasurer, and four Directors will be on the ballot, which is available at [www.aiche.societyelection.com](http://www.aiche.societyelection.com). To be eligible to vote, you must have paid your dues for 2016. Paper ballots were mailed on Monday, August 29. The deadline to receive your vote is October 10, 2016, 11:59 p.m. EDT.

Profiles of the candidates for this year's election are available at <http://www.aiche.org/about/governance/elections/2016-board-directors-election>.

Make your voice heard and vote for the candidates of your choice.

(Excerpt from AIChE email dated 8/31/2016)

## UT Student Poster Presentation at September Meeting

Andrew Lepore, University of Tennessee, Energy Science and Engineering (Bredesen Center) PhD candidate, will present a poster on his research at the September meeting of the Knoxville-Oak Ridge Section of AIChE. You are invited to either arrive at 5:30 p.m. or remain after the regular meeting to talk with Andrew about his work.

Title:

**Red Mud as an In situ  
Pyrolysis Catalyst: Its Ability  
and Its Concurrent  
Remediation**

Abstract:

Catalytic pyrolysis may provide an alternative strategy to producing petroleum-derived fuels and chemicals. Red mud, a toxic industrial bauxite byproduct, could serve as an economical catalyst, thereby overcoming the development of more robust catalysts. In situ catalytic pyrolysis was run on a semi-pilot scale with various loadings of red mud mixed into the switchgrass (*Panicum virgatum* L.) feedstock. It is proposed that the coking process would render red mud environmentally benign and could, like biochar, improve soil quality for plant growth. Therefore, this work investigated i) red mud's capability to enhance biooil quality, and ii) how the modified biochar produced from in situ

pyrolysis affected switchgrass establishment, seedling vigor, and root and shoot development. Red mud was effective at increasing the pH and reducing the total acid number (TAN) of the resulting biooil. While, high loading of reacted red mud had a negative impact on plant yield, adding uncatalyzed biochar to pure red mud significantly improved seedling yields on marginal soils.

Bio:

Andrew Lepore, is currently working to complete his PhD under the guidance of Chaitanya Narula at ORNL. Over the past four years his research has mainly focused on vapor phase heterogeneous catalysis for the synthesis of liquid fuels and valuable feedstock chemical for applications such as, renewable carbon fiber. He has also spent some of his time working on in-situ catalytic pyrolysis funded by the Next Big Idea competition at ORNL. He earned his Bachelor Degrees in Chemistry from St. Lawrence University and in Chemical engineering from Columbia University.



Andre Lepore



THE UNIVERSITY OF  
TENNESSEE



## Activities Calendar

Date	Time	Topic	Speaker	Location
Sept 22	6:00 PM	Advanced Manufacturing	Lonnie Love, ORNL	Rothchild's, Knoxville TN
Oct 20	6:00 PM	Fuels R&D Supporting Informed Decision-Making	Brian West, ORNL	Rothchild's, Knoxville TN
Nov 10	6:00 PM	Bioenergy	Bryan Biss, Proton Power	Rothchild's, Knoxville TN
Dec 1	6:00 PM	Joint meeting with SWE – Bee keeping OR Jeopardy Experience	Howard Kerr OR Steve Belding, UCO	Rothchild's, Knoxville TN
Jan 12-19	6:00 PM	Senior engineer communicating experiences from career	Michael Aident	Rothchild's, Knoxville TN
Feb 21	6:00 PM	Joint meeting with ANS – Watts Bar Startup OR Tennesseine (element 117) Discovery	TVA Engineer OR Jim Roberto, ORNL	Calhoun's, Oak Ridge TN
Mar 23	6:00 PM	Joint meeting with UT – Unit Operations Lab Tour	TBD	UT – Dougherty
Apr 18	6:00 PM	TBD – Possibly: Kingston coal ash cleanup	Emory Ford	Rothchild's, Knoxville TN
Apr 20		UT Department of Chemical & Biomolecular Engineering Awards Banquet		TBD
May 11	6:00 PM	TBD	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!



ORNL Traveling Science Fair – Knox County Schools Career Day, 2016

(Photo courtesy of DOE Digital Photo Archive <https://www.flickr.com/photos/oakridgelab/>)

## Officers

<b>Chair:</b>	Mark Swientoniewski	574-1150	<a href="mailto:swientoniem1@cns.doe.gov">swientoniem1@cns.doe.gov</a>
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*"I always wondered why somebody doesn't do something about that. Then I realized I was somebody."*

**Lily Tomlin**  
1939-present  
Actress

## 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...AIChE Academy

The AIChE Academy provides a full array of education and training resources to chemical engineers. You'll find courses, webinars, conference presentations and more from AIChE, CCPS (Center for Chemical Process Safety), SBE (Society for Biological Engineering), IfS (Institute for Sustainability), and ISWS (International Society for Water Solutions). You can search by topic, availability of CEUs (Continuing Education Units) and PDHs (Professional Development Hours), delivery method, skill level - even location.

For additional information on AIChE Academy, refer to:

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

Source: National AIChE website, <http://www.aiche.org/academy>

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