

# The Packed Column

American Institute of Chemical Engineers - Upper Midwest Section

May 2006

## **CHAIR'S CORNER**

by Mark Arlinghaus

### **Would It Still Be Chemical Engineering Without Reactor Design?**

At this year's AIChE Symposium, Dr. Ed Cussler challenged us to think about how the chemical engineering curriculum could be modified to better suit undergraduate students. One approach to answering this question is to predict where B.S. Chemical engineers will be working and to mold the curriculum to fit the needs of those employers. Dr. Cussler asserts that many chemical engineers will continue to be hired by traditional commodity chemical companies and that the current curriculum does an adequate job of preparing them for that work. Chemical engineers have long been hired by a variety of industries outside of commodity chemicals, and it is these jobs that call into question the relevance of the current class requirements.

Chemical engineers can be found in the product development groups of almost every major company in America. From food to medical devices, our training has made us desirable whenever people have wanted new goods. We might congratulate ourselves on our versatility, but we would do well to ask the question, "Have chemical engineers been hired so broadly simply because there was no better alternative?" If this is the case, we could lose our enviable position relative to starting salaries and job opportunities unless our degree offers a better match to the needs of development groups. Increased competition from overseas engineering talent and a broadening of other engineering and science degree programs could mean that fewer of these jobs go to graduates of our chemical engineering schools.

In Dr. Cussler's model, many of the non-commodity chemical companies can be describes as "function

driven" companies. That is, the success of their product is primarily determined by how well it does its job, not by its price or its timing for market entry. This differentiates them from commodities where price is everything and from industries such as pharmaceuticals where being first to market can be far more important than being the most effective drug. Function based companies might sell just components (as BASF declares in its advertising campaigns), or they might sell finished goods. What do these function based companies need? I offer that they need employees with more training in business skills (e.g. finance, communications, consumer research), more training in how to design research plans and less training in esoteric matters of quantum mechanics and thermodynamics. Certainly someone must be an expert in these fields, but we already ask too much of an undergraduate for a bachelor's degree. Something has to go if we are to add more material. Too much of the material taught in chemistry, math and physics is irrelevant to bachelor degree engineers. Even within our discipline, some of the traditional classes are less relevant outside the commodity world. Taking the typical reactor design class may be critical for someone going to work in a refinery, but their class mates might be better served by technical case studies of the development of successful and failed products.

In a previous column, I celebrated the strengths of the traditional chemical engineering curriculum. I do not consider this an about face. Instead, I think that departments need more flexibility for students who pursue jobs in function based fields. In a final note of agreement with Dr. Cussler, not all programs need to be the same. It would be great if some schools concentrated on the traditional curriculum while others experimented with new offerings. Then students could decide which programs would best prepare them for their future jobs.

# YPAB MEETING

Dear Colleagues,

On behalf of the YPAB, I'd like to invite you to a spring social at Gameworks on Monday, May 8. Join us for happy hour, bowling, and games. This event has it all--beer for anyone who can't make the U of MN year-end bash, networking, and it might be more fun than listening to symposium speakers ;). You might even consider bowling "exercise."

Time: 5:30pm happy hour at Hopscotch Grill; 6:30 bowling or games

Date: Monday, May 8th

Place: Gameworks, Block E, Minneapolis

(<http://maps.google.com/maps?q=600+Hennepin+Ave+Minneapolis,+MN&iwloc=A&hl=en>)

Event: bowling and games

Cost: commensurate with the amount of fun to be had. Food-typical prices; games & bowling details below.

## BOWLING

For those who prefer bowling to interactive video games, we'll meet at the Hopscotch Grill downstairs at 6:30 then move upstairs to the lanes to actually bowl. Cost is \$4 per person per game plus \$2.50 for shoes plus tax.

## OTHER ATTRACTIONS

If you're not familiar with Gameworks, check this out--lots and lots of video games!

<http://www.gameworks.com/games.php>

I'm not sure how much individual games cost; prepaid cards from \$5 to \$20 can be purchased.

## DIRECTIONS

<http://maps.google.com/maps?q=600+Hennepin+Ave+Minneapolis,+MN&iwloc=A&hl=en>

Hope to see you there--it will be a great time. Feel free to contact me with any questions.

Sarah Bauer Hansen

612-597-2540 cell

612-252-3655 work

[hansenst@gmail.com](mailto:hansenst@gmail.com)

[sarah.hansen@amec.com](mailto:sarah.hansen@amec.com)

**Place an ad here and get results! Reach over 700 chemical engineers!**

**Nathan Johnson, [doc\\_curtis@rocketmail.com](mailto:doc_curtis@rocketmail.com)**

**651-737-0144**

## MAY MEETING

### *An overview of Innovative Non-thermal Food Preservation Technologies*

#### **Tour Host and Speaker: Roger Ruan\*, Ph.D., Professor**

\*Dr. Ruan is affiliated with Departments of Biosystems and Agricultural Engineering, Department of Food Science and Nutrition, Department of Biobased Products  
University of Minnesota, St. Paul, MN 55108, USA

#### **Time:**

Wednesday, May 17, 2006,  
5:00–6:15 PM

#### **Meeting location:**

Room 106, BAE Bldg.,  
1390 Eckles Avenue, St. Paul, MN 55108

#### **Lecture and Tour Description:**

Non-thermal plasma (NTP) is electrically energized matter in a gaseous state, which can be generated by electrical discharge. Professor Ruan's most recent research efforts are focused on the generation of high voltage electric field using innovative nonthermal plasma. He will provide an overview of NTP technology and its possible industrial applications. The related reactor design and process optimization will be discussed as well as the research data from several examples representing liquid and solid foods.

After the talk, participants will tour the Non-thermal Processes (NTP) for Food Preservation Laboratory and Bioproducts Magnetic Resonance Imaging (MRI) Laboratory at the St. Paul Campus.

#### **Reservations**

Reserve a tour spot by sending an e-mail to [kurt.waananen@genmills.com](mailto:kurt.waananen@genmills.com) by May 15th

**Tour will be limited to the first 30 reservations.**

#### **Cost**

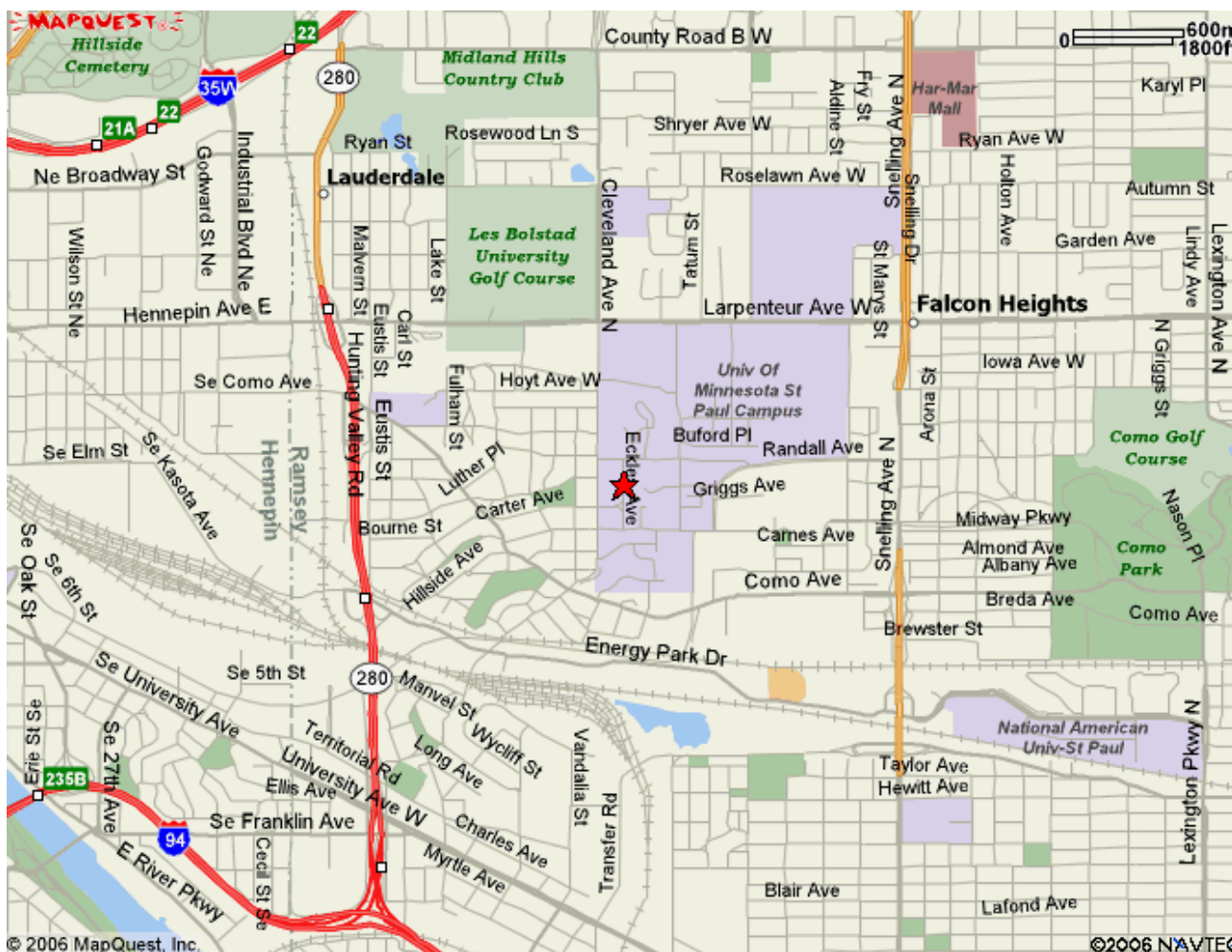
The tour is free for local section members, \$12 for non-members

#### **Agenda**

5:00 – 6:15PM: Lecture and Tour (light snack and beverages will be provided)

#### **Link to Directions**

<http://www.mapquest.com/maps/map.adp?formtype=address&addtohistory=&address=1390%20Eckles%20Ave&city=Saint%20Paul&state=MN&zipcode=55108%2d1038&country=US&geodiff=1>



Chair	Mark Arlinghaus	General Mills Corporation	<a href="mailto:Mark.Arlinghaus@genmills.com">Mark.Arlinghaus@genmills.com</a>	763-764-5808
Vice Chair	Kurt Waananen	General Mills Corporation	<a href="mailto:kurt.waananen@genmills.com">kurt.waananen@genmills.com</a>	763-764-7446
Symposium Co-Chair	Jim Easton		<a href="mailto:jimeaston@mn.rr.com">jimeaston@mn.rr.com</a>	952-947-4083
Symposium Co-Chair	Brian E. Jensen		<a href="mailto:brianejensen@prodigy.net">brianejensen@prodigy.net</a>	952-926-2141
Recording Secretary	Matt Atkins	Fluor Global Services	<a href="mailto:matt.atkins@fhr.com">matt.atkins@fhr.com</a>	952-492-5315
Membership Secretary	Nathan Johnson	Pace Analytical	<a href="mailto:doc_curtis@rocketmail.com">doc_curtis@rocketmail.com</a>	651-737-0144
Treasurer	Elizabeth Gonzales	3M	<a href="mailto:eegonzales1@mmm.com">eegonzales1@mmm.com</a>	651-737-5226
Past Chair	Dr. Ryan O'Connor	NatureWorks LLC	<a href="mailto:Ryan_Oconnor@natureworksllc.com">Ryan_Oconnor@natureworksllc.com</a>	952-742-0455
Continuing Ed & Awards	Eric Hockert	Boston Scientific	<a href="mailto:Eric.Hockert@bsci.com">Eric.Hockert@bsci.com</a>	763-494-1892
Webmaster	Gordy Siers	Hutchinson Technology Inc.	<a href="mailto:gsiers@member.aiche.org">gsiers@member.aiche.org</a>	320-587-9542
Young Professionals Chair	Matt Atkins	Fluor Global Services	<a href="mailto:matt.atkins@fhr.com">matt.atkins@fhr.com</a>	952-492-5315
3M Chair	Steven Zhang	3M	<a href="mailto:szhang2@mmm.com">szhang2@mmm.com</a>	651-737-6773
U of M Chapter Liaison	Dr. Satish Kumar	University of Minnesota	<a href="mailto:kumar@cems.umn.edu">kumar@cems.umn.edu</a>	612-625-2558
General Mills Chair	Thomas Kempf	General Mills Corporation	<a href="mailto:thomas.kempf@genmills.com">thomas.kempf@genmills.com</a>	763-764-2873
Boston Scientific Chair	Eric Hockert	Boston Scientific	<a href="mailto:Eric.Hockert@bsci.com">Eric.Hockert@bsci.com</a>	763-494-1892
Publicity Chair	OPEN			
Your Company Chair	OPEN			

**MAKE SURE TO CHECK OUT OUR WEB SITE AT:**

**<http://www.aichelocal.org/tc>**

**Fluor Position Title:** Instrumentation Designer**Job Description:**

Perform instrumentation and electrical design for new construction and plant modifications in a refinery, petrochemical environment.

- Generate control loop diagrams
- Create wiring diagrams
- Create conduit routing drawings
- Create and modify P&ID's
- understand DCS and PLC wiring, I/O requirements
- must have good understanding of the field instruments, brands, models etc. and able to create instrument mounting details (e.g. pressure, temperature, orifice plates, control valves, transmitters, switches, etc.)
- familiar with instrumentation and equipment location plans and installation details (e.g. tubing manifolds, instrumentation/transmitter mounting, etc.).
- AutoCAD 2002+ experienced
- Prior experience in a refinery or petro-chemical facility.

**Fluor Position Title:** Instrumentation/Controls Engineer**Job Description:**

Instrumentation and Control Systems Engineer with oil and gas experience. Position will be a key member of onsite engineering and design group for a Midwest refinery. Person will be responsible for developing and reviewing control system strategies, review and updating P&ID's with recommended control logic, producing control loop drawings, specifying instrumentation (i.e. pressure, temperature, level gauges, flow meters, control valves, analyzers), and completing data sheets in an oil and gas facility. Prior experience with performing calculations for sizing and selecting control valves for gas and liquid services is required; along with performing the necessary calculations for flow orifice plates. Will also request instrumentation vendor quotes and enter purchase requisitions. Instrumentation and control applications are very diverse with many complex and demanding services. Must be able to understand process requirements, provide options for control instrumentation solutions, and make recommendations. Person must be able to communicate ideas clearly, and be a technical resource for instrumentation and controls. Requirements include BS/MS in ChemE, EE, with 10+ years experience in a petrochemical environment.

**Fluor Position Title:** Project Engineer**Job Description:**

Project engineer for on-site capital projects engineering group at a major mid-west refinery. Perform all duties required to develop scope for new projects, guide projects through the phased engineering design process, and provide engineering support during construction. Ten years experience with refinery and petrochemical units is required, preferably with on-site engineering design. Project engineering experience with projects in the \$1MM to \$20MM range, TIC. Prefer Senior Project Engineer, but will consider intermediate level with less than 10 years experience in refinery environment. BS/MS Chem Engr or Mechanical

**If interested, please contact:**

Daniel J. O'Neal, Site Manager  
Fluor Operations & Maintenance  
Daniel.O'Neal@Fluor.com

**COATING PROCESS FUNDAMENTALS SHORT COURSE**

by Phil Jensen

June 12-14, 2006, University of Minnesota, Minneapolis

This course provides coating engineers and their colleagues with an understanding of the principles of the many processes by which liquid coatings are applied and solidified. The course, led by L. E. Scriven, is designed for engineers who are engaged in coating and who seek a deeper understanding of processes and processing problems. It is also relevant to physical scientists concerned with the formulation of coating liquids for processability and microstructure development.

Contact: Heather Dorr, [conferences5@cce.umn.edu](mailto:conferences5@cce.umn.edu), 612-625-5267.

Website: [www.cce.umn.edu/coatingprocess](http://www.cce.umn.edu/coatingprocess)

**WELCOME NEW SECTION OFFICERS**

by Nathan C. Johnson

Welcome to our newly elected officers of the Twin Cities/Upper Midwest section of AIChE! The annual election was held at the symposium. Those listed below will compose the executive committee for the following year. Thanks to all who volunteered, and who participated in our election.

Chair	Kurt Waananen
Vice Chair	Matt Atkins
Symposium Chairs	Jim Easton Brian E. Jensen
Recording Secretary	Volunteer Needed
Membership Secretary	Nathan C. Johnson
Treasurer	Elizabeth Gonzales
Webmaster	Gordy Siers
U of MN Liaison	Dr. Satish Kumar
Cont. Ed. and Awards	Eric Hockert
YPAB Director	Sarah Hansen
Publicity	Volunteer Needed
Past Chair	Mark Arlinghaus



**American Institute of Chemical Engineers  
Upper Midwest Section  
c/o Nathan C. Johnson  
8500 177<sup>th</sup> Lane  
Forest Lake, MN 55025**