ROSE-HULMAN INSTITUTE OF TECHNOLOGY

ISSUE 03
WINTER 2013-14

CHE PIPELINE

CHEMICAL ENGINEERING DEPARTMENT NEWSLETTER

in this issue

Chemical Engineering Department

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Adam J. Nolte
Department Head and Assistant Professor

Erin Phelps
Visiting Asst Professor

Sharon G. Sauer
Associate Professor

Atanas Serbezov
Professor

Staff

Frank Cunning
Technician

Lisa Harwood
Secretary

Notes from the Department Head – Dr. Adam J. Nolte

Happy New Year to all of our alumni and friends! Though the weather in Terre Haute has been cold and snowy, things were warm and bustling inside Olin Hall leading up to the Winter break. Now that school is back in session, we have only the memories of summer to keep us warm until the Spring thaw. I am personally reminded of last August, when I had the opportunity to visit the Denver area and I made a point of spreading some Rose-Hulman pride among the foothills overlooking the Colorado School of Mines.

*Dr. Adam Nolte showing his Rose-Hulman pride and confirming that the scenery above the Colorado School of Mines isn't **THAT** much better than Terre Haute!*

Since our last update, the Fall 2013 term yielded several opportunities for connecting with department alumni, including the annual homecoming open house and Advisory Board meeting. At the open house on September 21, I was delighted to meet and give laboratory tours to a number of department alumni—some on campus for their 55 year reunion! We are also extremely grateful for the helpful advice gathered during our annual Advisory Board meeting on November 15. More information about the Advisory Board can be found on Page 6.

In other news, the department received notice in the fall that our program's accreditation status has been renewed by ABET for another six years. The accreditation process involves a lot of hard (and often hidden) work by the department faculty and academic leadership, and besides the value of the accreditation status itself it is nice to have affirmation of our continual efforts to improve our program in order to graduate the best-trained chemical engineers possible.

One relatively recent addition to our program has been a course titled *Energy and the Environment*, taught for the past five years by Dr. Sharon Sauer. In this issue of the Pipeline, Dr. Sauer shares a little about the course and its objectives. As a reminder, the names, faces, and professional interests of the current department faculty and staff can be viewed online anytime on our faculty/staff page.

In this issue we are also starting a new feature: *Voices of Alumni*. Eric Anders ('99) and John Swearingen ('81) have graciously agreed to share information about their professional journeys and how they were prepared by Rose-Hulman for those careers. If you are interested in contributing your story to future issues of the newsletter, please contact us.

In addition, I have asked the department student groups (AIChE, Omega Chi Epsilon, and Chem-E-Car) to give updates on their activities.

Before I wrap up this column, I want to again invite you to share your ideas and opinions on content. I want to make this electronic newsletter a useful resource for department news, and a helpful means for staying connected to your Rose-Hulman family. On that note, we are very interested in *ChE alumni news*. Please send us any personal and professional announcements you would like us to include. Thoughts, comments, feedback, and alumni news items can be sent to Lisa Harwood (812-877-8430).

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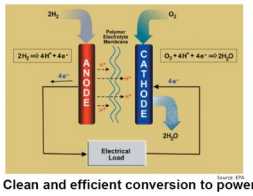
Energy and the Environment

Dr. Sharon Sauer

Over the last few decades the relationship between energy consumption and environmental changes, in particular climate change, has become a subject of great interest. The department implemented a course on the subject while Dr. Jessica Anderson Kuczenski was at RHIT as a visiting professor in 2007-08. She had done some relevant work in the field as part of her PhD dissertation and taught this course as an elective. Due to the interest level among students, the department made the decision to include the course as a chemical engineering elective in 2009. The course has been offered each winter since that time and I have had the privilege of being the instructor.

The course provides an overview of a range of topics related to energy production and consumption and the environmental impacts. The material in the first part of the course is focused primarily on traditional means of energy production and the impact on the environment. The second part of the course is focused on climate change, climate modeling, life cycle analysis, newer energy technologies as well as developing energy technologies. Students complete one research paper related to the traditional modes of energy production and one related to the newer or more "green" technologies. This provides the opportunity for them to investigate a subject of their choosing in more depth.

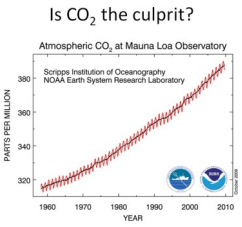


Clean and efficient conversion to power
No pollutants – only water as byproduct

A variety of readings are assigned ranging from short news articles to scientific literature. The particular articles change each year in order to keep the course content current. The students write a short one to two page response indicating their thoughts and opinions regarding what they read. The topic is then discussed in class. Discussion is a significant part of the course with each student given the opportunity to share their thoughts and is encouraged to do so. In addition, a variety of videos relating to current energy topics are also shown in the class and discussed.

Some recent topics of discussion have included the following: the Deepwater Horizon oil spill in the Gulf of Mexico, the Fukushima Daiichi nuclear disaster, mining of the tar sands in Alberta, Canada, the controversy surrounding coal mining expansion in New Zealand, the environmental impacts associated with the increase in energy production and usage in developing countries such as India and China, using fracking in the retrieval of natural gas in the US, and the possibility of using oil shale as a means to obtain petroleum fuels, among others.

One goal of the course is for the students to walk away having been exposed to and thought about the pros and cons of a variety of energy production methods. Many facts regarding usage, fuel reserves, and emissions are presented. It is left to the student to conclude whether or not significant climate change is occurring, whether or not the increase in the average global temperature is in part due to anthropological causes or part of the natural climate cycle of the earth, and how "green" are the newer technologies.



Call for Senior Design Project Consultants from Industry

On March 10 the students from the graduating senior class will start working on their design projects. Students will have 9 weeks to complete the projects. The projects are:

- Biofuels from Algae Pilot Plant
- Dicyclopentadiene (DCPD) Plant
- Propylene Production via Propane Dehydrogenation

We are looking for alumni who are willing to serve as project consultants. Each consultant will be paired with a design team of 4 students. Our expectations are that the consultant will participate in a weekly one hour on-line project meeting with the team. The meeting will be led by a student project manager and facilitated by the course instructor. Students will report on their progress. The consultant and the course instructor will provide feedback to the team and will answer questions.

If you are interested in becoming a design project consultant, or would like to have more information, please contact Dr. Atanas Serbezov.

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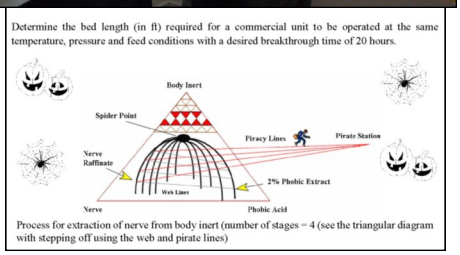
Holiday Snaps

This is definitely worthy of a "caption contest". Submit your best caption here!

Dr. Atanas Serbezov, Dr. Hossein Hariri, and Dr. Kim Henthorn "get in the Halloween spirit" for their Fall Design I class.



Everyone got a treat from Santa this year!

Students enjoying the Senior Holiday Party — look at all that yummy food!

Department secretary Lisa Harwood doing her best reindeer impersonation.

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American Institute of Chemical Engineers

The American Institute of Chemical Engineers (AIChE) chapter at Rose-Hulman exists to provide resources to help students develop professionally, succeed academically, and learn of the vast opportunities that exist for professional chemical engineers.

Elias Eteshola, President, AIChE

This past year, our chapter has held several on- and off-campus events, including hosting a welcome cookout, bringing in a company representative to help students tailor their resumes for the career fair, and bringing in industry representatives to hold professional development information sessions. There have also been some rewarding and fun events such as participating in the Rose Day of Service and unwinding with professors outside of the classroom at a happy hour at 7th & Elm. We have also had students take plant trips to local industries to see the applications of the concepts they are learning in the classroom.

The chapter has been undergoing some reconstruction to help better get the AIChE name out into the community. Some of those changes include a major overhaul of the chapter's website and the addition of a webmaster chair. The executive board also hopes to add a social chair to help spread awareness of our activities and information pertaining to chemical engineering on social media platforms such as Facebook, LinkedIn and Twitter.

If you or your company would like the opportunity of interacting with our chapter, please contact Dr. Adam Nolte. The Rose-Hulman AIChE chapter would like to acknowledge Marathon Petroleum Corporation for their recent financial support of our chapter.

Chem-E-Car

The national AIChE organization holds an annual Chem-E-Car competition where students from across the country design small-scale automobiles that operate through only chemical mechanisms. During the competitions, which are organized on both regional and national scales, the cars must drive a fixed distance carrying a certain payload and stop without any mechanical brake or timer assistance. The team is judged by how far its car is from the finish line, along with a poster describing the unique features in the car. The size of the designed car cannot exceed certain specifications and it must operate using "green" methods. The top five teams in a region go on to the national competition. Rose-Hulman's team has only been active for the past two years and has already competed in regional competitions in Akron (2011) and Cincinnati (2012). We are hoping that 2013 will be the year we qualify for the national competition.

Chandler Bass, President, Chem-E-Car

The Rose-Hulman 2013 car is completely redesigned from the previous years' models. The vehicle is still under a large amount of development, however, so details are subject to change. Rather than use a hydrogen fuel cell as we had in the past two years, the team has investigated multiple types of batteries as the primary power source. The team selected a lead-sulfuric acid battery as the power mechanism for the new car. We are also working on a precise stopping method in order to make the car more competitive. Two primary mechanisms are under investigation at the moment: an iodine clock reaction and a pressure-triggered power regulator.

The Rose Chem-E-Car team is proud to welcome six new members to the team this year. We are planning to attend the 2014 regional competition, set to take place at the AIChE 2014 North Central Student Regional Conference at Michigan State University on April 11-12.

The Rose-Hulman Chem-E-Car team would like to acknowledge Dow Chemical and Marathon Petroleum Company for their generous support of the team. If you or your company would like to learn more about the Chem-E-Car team, please contact the team advisor, Dr. David Henthorn.

Omega Chi Epsilon

Omega Chi Epsilon, or OXE, is a national academic honor society for chemical engineering students. The organization was founded in 1931 at the University of Illinois to promote the goals of recognition, investigation, service, comradeship, and professionalism in chemical engineering.

Jacob Ballard, President, OXE

One of our main responsibilities as a club is the maintenance and continual improvement of the design lab in the chemical engineering department. Some past projects have included organizing the library of reference books and improving the bulletin boards. We have recently purchased a coffee maker for students and faculty. OXE is also responsible for collecting senior input and awarding the annual outstanding student and professor awards. Outside of these responsibilities, we strive to foster comradeship among our members. Our first event of the year was a back to school social where members discussed their summer work experiences.

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Voices of Alumni

Eric Anders

Senior Process Engineer
Taghleef Industries

After graduating with honors in 1999, Mr. Anders took a job as a process improvement engineer with Milliken and Company at their Elm City Plant, located in LaGrange, GA, making automotive textiles. From there, he had the opportunity to take on several different roles within the company, such as Automotive New Products Manager for Milliken's Elm City and Duncan Stewart plants, Advanced Production Manager for Duncan Stewart, Senior Development Engineer at Milliken's Design Center, and his last role was as a Senior Process Improvement Engineer at Milliken's Valway plant on a line which chemically coated air bags for various automotive companies.

After five and half years with Milliken, Mr. Anders and his wife wanted to return closer to their parents, so they began looking for jobs in the Terre Haute area. In October, 2004, Mr. Anders was hired as a process engineer with AET Films (now named Taghleef Industries) at their Tubular plant located here in Terre Haute, which produces food-grade polypropylene films. After being promoted to Senior Process Engineer in 2010, Mr. Anders saw his duties expand to include numerous customer visits, increased interaction with AET's R&D Center in Newark, DE to develop and trial new products, and mentoring roles with other engineers and operators in addition to daily problem-solving and improvement activities. Mr. Anders continued to increase his problem-solving toolbox while at AET, earning his Six Sigma black belt from Villanova University in 2005, and Kepner-Tregoe certification in 2006.

Here is what Mr. Anders had to say about his preparation at RHIT for the diverse roles he has had in industry: *"Rose-Hulman prepared me for real-world professional activity in myriad ways. The rigor of the program not only instilled in me the discipline and dedication required to be successful in solving the challenging tasks I've encountered in the manufacturing environments I've been in, but also gave me the occasion to improve my time management skills through balancing campus activities with school workload; the design projects and labs gave me the opportunity to learn to work cohesively with others who have differing personalities, backgrounds and methods of solving problems; the on-campus activities which are available afforded me the chance to take on leadership roles outside the classroom and to recognize the value of participating in programs outside of Work"as good stress relievers. These are just a handful of examples that explain how Rose-Hulman facilitated my development as a problem-solver and teammate so that I was well-equipped to go out and make a positive, meaningful impact in any professional path I chose."*

John Swearingen

Vice President
Health, Environment, Safety & Security
Marathon Petroleum Company

Mr. Swearingen graduated with a bachelor of science degree in chemical engineering from Rose-Hulman Institute of Technology in 1981. He completed the Wharton School Advanced Management Program at the University of Pennsylvania in 2006.

Mr. Swearingen joined Marathon in 1981 as a process engineer at the Robinson, IL, refinery. After various assignments at the refinery, he transferred in 1987 to the corporate refining staff group in Findlay, OH, to assist in capital budget development and long-range planning. From 1989 to 1992, he worked at the Indianapolis, IN, refinery and held various technical and operations management positions. Mr. Swearingen then relocated to the Garyville, LA, refinery as technical services manager in 1992, and in 1994 returned to Findlay as refining engineering manager on the corporate staff. With the formation of the Marathon Ashland Petroleum LLC* joint venture in 1998, he was named to the position of Asset Development manager with responsibility for capital budget development and strategic planning for the refining group. Mr. Swearingen became manager of the Illinois Refining Division, Robinson, IL, in November 2001. In January 2009, he was appointed president, Marathon Pipe Line LLC. He was named to his current position on July 1, 2011.

Mr. Swearingen chaired the American Petroleum Institute General Committee on Refining in 2007; served on the board of directors for the Association of Oil Pipe Lines in 2010-2011; is on the Rose-Hulman Chemical Engineering National Board of Advisors; and is a member of the American Institute of Chemical Engineers.

Here is what Mr. Swearingen had to say about RHIT: *"I always felt that Rose did an outstanding job in preparing me on the technical aspects of the various positions I've held. And not so much in the details or specifics, but in being able to reason through complex, technical issues from a first principles standpoint to identify and understand the core aspects. Along with the engineering and technical background, Rose also prepares you well for tackling the broader issues that you face as an executive or senior company leader. Whether they're commercial or business issues, public policy, leadership or stakeholder relations, I've found there are usually parallels in approaching these issues the same as with technical problems. Engineering is really about a way to think and reason, how to innovate and implement, always with an eye to the end game and just what it is you're trying to accomplish. Rose was an exceptional experience for me in cultivating those mindsets and being able to apply them effectively."*

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ChE Advisory Board Members (2013-2014)

Joe Alford

Eric Anders

Cameron Bagley

Brad Berron

Todd Brown (2013 Meeting Chair)

Rich Hale

Lisa Hall

Greg Hevron

Kyle Kamischke

Jason Karlen

Dustin Martin

Bernard McGarvey

Steve Meyer

Bruce Parker

Tony Poparad

Sarah Sanborn

John Swearingen (2014 Meeting Chair)

The Rose-Hulman ChE Advisory Board is a group of alumni and friends of the department with experience and expertise in various industrial and academic sectors. Members of this group meet annually on campus with the department to provide feedback and advice on our program. The ChE Advisory Board is a critical and valuable part of our team. Its members provide assistance in assessing our goals, planning for the future, and ensuring the relevance and effectiveness of our program. The membership of the advisory board changes from year to year; we attempt to maintain a diversity of industrial sectors, corporate representation, and alumni graduation years.

Alumni News

Jessica (Farmer) Albert (‘04) is a new process improvement engineer at The Lubrizol Corporation in Houston.

Jeff Burgan (‘77) has been elected to the board of directors for the Lambda Chi Alpha Educational Foundation, supporting leadership development and education programs.

Damon Ground (‘82) has joined Watlow as chief marketing officer. He formerly worked at TSI Inc., Hutchinson Technology, and 3M Corporation.

Chris Mack (‘82) has ridden an innovative wave through lithography. Click here for the full story.

Sarah Sanborn (‘04) was recognized at homecoming as a Distinguished Young Alumni Award winner.

Robert L. Wilkins (‘86) has been confirmed by the U.S. Senate as a judge for the U.S. Court of Appeals. Click here for the full story.

Alumni Marriages

Bridget Goergen (CHE ‘10; MSEM, ‘11) and **Daniel King** (BE ‘10; MSBE ‘11) were married on August 31, 2013 in Alexandria, Minnesota. Bridget is a process engineer for GEA Corporation in Columbia, Maryland. Daniel is a product development engineer at ACell Corporation in Columbia. Congratulations!

Alumni Babies

Adam Hirsch (‘07) and wife, **Jennifer (Frey) Hirsch** (‘07), welcomed a daughter, Hannah Marie, on July 25, 2013. Congratulations!

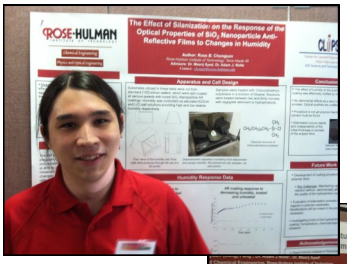
Christina (Muhlenkamp) McGraw (‘09) and husband, Matthew, welcomed their first child, Megan Marie, on July 6, 2013. Congratulations!

Student News

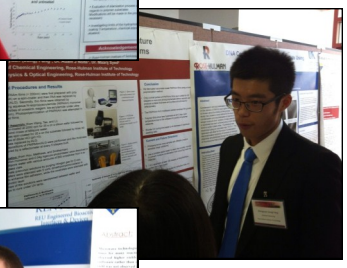
Congratulations **Rachel Johnstone** on being chosen to the first-team, all-district squad in Women’s Soccer. You should be very proud of your athletic and academic accomplishments. All of us at Rose-Hulman certainly are!

Katherine Moravec has gained research experiences at the National Stem Cell Institute. Click here for the full story. The department would also like to congratulate Kat on being selected as the 2013 Homecoming Queen. Good job Kat!

Several students participated in the October IRC poster sessions, including **Ross Chongson**, **Matthew Conrad**, **Zhengyuan (Jung) Fang**, **David Harvey**, **Gregory Horne**, **Brent Hukill**, **Dustin Lehmkuhl**, **Leah Markowitz**, **Casey Mihal**, **Katherine Moravec** and **Ziyang Yin**. Well done to all!



Ross Chongson



Zhengyuan (Jung) Fang

David Harvey

Ziyang Yin

Designating the Chemical Engineering Department as the recipient of your financial gift to the Institute helps us continue to offer cutting-edge educational equipment and learning experiences to our students. Click here for more information on the various ways to give, or contact Jennifer Kenzor in Institutional Advancement. Thank you for your support!