Greetings. It has been another rewarding year here at the University of North Dakota. One of the most exciting events for the Chemical Engineering Department was the creation of the Ann and Norman Hoffmann Chair in National Defense/Energetics (see related article). This endowment will provide funding to help support a new faculty line. We have also been notified that a major North Dakota NSF EPSCoR grant has been funded, allowing us to convert Dr. Parker’s position from a visiting to a tenure-track position.

The success of SUNRISE will also allow us to bring on another visiting faculty this fall. With the addition of these new faculty members, the department will be staffed at an unprecedented level where we can enhance the quality of our undergraduate program while continuing to grow our graduate program.

The focus of our summer assessment retreat was a major review of our curriculum. We have formulated a number of ideas to discuss with the Industrial Advisory Committee (see page 15) when we meet in December. It is our goal to ensure that our graduates are adequately exposed to current trends while maintaining our strong emphasis on the fundamentals. Critical thinking, communication, life-long learning and other traits essential to success are interwoven into all aspects of the curriculum. If you have thoughts on improvements to our curriculum please let me know.

by Leanna Ihry

It may not seem like much money today, but in 1954 when Norm Hoffman, ’59, had to fork over $15 to secure a dorm room at UND his first semester, it seemed like a fortune. In fact, when the woman in the housing office asked for the money, Hoffman didn’t want to give it to her. “I just wasn’t sure about college,” Hoffman said.

After a little more consideration, he handed over the money, knowing he would now have to attend or lose the nonrefundable deposit.

It’s the UND clerk who insisted on that $15 who is responsible, in part, for the $2 million gift Hoffman and his wife, Ann, gave to the University through the UND Foundation in June.

Hoffman hasn’t once regretted his $15 decision. The chemical engineering grad began his successful career in California, started his own company, Technical Ordnance, in Minnesota in 1964, and served as chairman of the board and president until he retired and sold the business in 2006.

“In Norm’s case, his accomplishments already represent an impressive legacy.

continued on page 2

Dr. Hesham El-Rewini has been named Dean of the School of Engineering and Mines at the University of North Dakota.

El-Rewini, a native of Egypt, has been a full professor and chairman of the Department of Computer Science and Engineering at Southern Methodist University in Dallas, Texas, since 2001. He led a department that is consistently ranked by U.S. News and World Report among the top computer engineering programs in the nation.

His department, along with SMU, was designated as a National Center of Academic Excellence in Information Assurance Education by the National Security Agency. He also helped create new graduate and undergraduate programs, while revamping and continually examining existing programs. “We are delighted to welcome Dr. Hesham El-Rewini to the University of North Dakota’s academic leadership team,” Weisenstein said. “He brings an incredible record of successful academic leadership to his new position as Dean of the School of Engineering and Mines.

“Dr. El-Rewini was selected from among several highly qualified candidates because of his proven abilities to help his
Hoffman Endowment cont’d

He could stop there and be satisfied. However, with this gift, his legacy will go on in perpetuity. His success will be compounded many times by the students who will benefit from his gift,” said Michael Mann, interim dean of the School of Engineering and Mines and chair of the Chemical Engineering Department.

Hoffman describes his career in an interesting way: “Have you seen the movie Air Force One?” he asked. “A scene in the movie shows the airplane being pursued by Navy planes. Air Force One expels a series of flares, which would confuse any heat-seeking missiles. Technical Ordinance makes the cartridges that kick out of the flares. This has proven to be a valuable counter-measure.”

Along with manufacturing these particular cartridges, Technical Ordnance, is an industry leader and manufacturer of detonators and initiators used primarily by the military. “Automation turned our company around. We made products for the Air Force, the Army and Navy,” Hoffman said.

“We also dealt with foreign countries,” added Ann. “Really, all our friends around the world.”

Hoffman acknowledges that some may criticize his work, “We essentially made components for fuses used in missiles, and explosive devices. If the United States doesn’t have a strong defense we’re in trouble. We owe it to our soldiers to give them the best defense possible.”

That said, he knows the statistics and believes providing this defense could be difficult in the future if something isn’t done. According to a Department of Defense study, “… the U.S. effort in research and development of energetic materials is small, fragmented and suboptimal, leaving this critical national technology at risk.” They also list “… training of replacements for the aging workforce” as a primary need.

As a way to contribute to the solution, the Hoffmans’ gift establishes The Ann and Norm Hoffman Chair in National Defense/ Energetics within the School of Engineering and Mines Chemical Engineering Department. “We had been talking about this for awhile,” said Norm, “and we knew we wanted to do this, but we didn’t know how to go about it. Then we received an invitation to a get-together at the president’s [Dr. Charles Kupchella] son’s house. I wondered if the president of UND would be there. Sure enough, he was, and that’s how we got this started,” Hoffman said.

At the Hoffmans’ request, one of the first tasks will be to build a repository of information on energetics. “The scientific knowledge in the area is highly dispersed. Some of it exists in documents difficult to obtain, while other information is in the minds of scientists and engineers working in the field. Hoffman’s dream is to collect the existing body of knowledge to preserve it for future generations,” said Mann.

Eventually, Hoffman believes UND will be training chemical engineers in energetics through research enhancements that make explosives safe. “I’m happy to give back to the University of North Dakota after what they gave me, and that’s a good education,” he concluded.

New Dean cont’d

academic units achieve national distinction and his strong commitment to student success.”

Before his time at SMU, El-Rewini was a full professor and interim chairman of the Computer Science Department at the University of Nebraska at Omaha. There he played a central role in his department, prioritizing for major budgetary cuts, while at the same time preparing his department for external and internal reviews.

He spent 11 years at UNO, also serving as assistant professor and associate professor in the Computer Science Department.

“I am very delighted to join the UND family and I look forward to working with the very capable engineering faculty and staff to move the school ahead,” El-Rewini said. Together, we can produce engineering graduates who can compete globally, contribute to the economic development of their region and nation and advance society.

“I believe that the School of Engineering and Mines at UND can play a critical role in a much needed national effort to retain and reassert the United States’ leading role in engineering and innovation.”

El-Rewini replaces Dr. John L. Watson as dean. Watson served the position from 2001 until his retirement March 31.

WIDOW OF CHE ALUM ENDOWS SCHOLARSHIP

Carroll Gullekson graduated with a BSChE in 1950. Carroll had a long career with Johns-Manville Company, holding various positions within the company. His widow, Lillian Gullekson, felt that Carroll would have wanted to give back to his University in a way that would benefit future students. Accordingly, Mrs. Gullekson has made a very generous testamentary gift through the UND Foundation, designated to the Department of Chemical Engineering, to establish the Carroll Gullekson Chemical Engineering Scholarship Endowment. It will be Carroll’s and Lillian’s legacy to help future Chemical Engineering students fulfill their dream of an undergraduate degree from UND ChE. On behalf of the entire UND ChE family, thanks Lillian!

(please contact Deb Austreng at 701/777-4838, UND School of Engineering and Mines, 243 Centennial Drive Stop 8155, Grand Forks ND 58202-8155, if you’d like to discuss the possibility of making a similar donation)

The Chemical Engineering Department Newsletter is edited and compiled by Wayne Seames, Robin T. Parker, and Jolo Seames. Contributions were provided by all CHE faculty, staff and the School of Engineering and Mines. Printing and distribution are coordinated by Barb Westensee, CHE departmental administrative assistant. Special thanks goes to the Alumni Foundation for supporting this publication, which is also available on our web page.

http://www.engineering.und.edu/che/
This past year marked my seventh with the UND Chemical Engineering department and the fourth since we formed the Sustainable Energy Research Group—SUNRISE. For those of you used to seeing your former faculty garner UND-wide awards, you won’t see any of those awards this year. The department and senior faculty are not eligible for many of the awards (can only receive one each five years) and our junior faculty have not yet accumulated sufficient years of excellence for these awards. Rest assured, our department continues to excel in undergraduate teaching and student-centered research.

Our two semester senior plant design sequence continues to be my main teaching priority. I’m always open to your suggested problems. This year’s groups designed a coal fired power plant with CO2 sequestration, a food grade canola oil facility, aniline from benzene, a plant to produce activated carbon from fruit pits, and a biodiesel plant co-located with a sugar beet refinery. Feel free to email me by mid-November if you have an idea that you’d like us to consider for a capstone design. I also use shorter length, single unit operation type problems in the first semester class, and am always looking for new ideas for these as well.

My duties as Director of the SUNRISE research group occupy much of my time. We now have 25 faculty in 12 different departments at UND, NDSU, Mayville State, and NDSCS-Wahpeton working on more than $11 million in research. I also helped to form the department’s first spin-off company, SUNRISE Renewables (see article on page 6).

One of my most exciting events was a trip to South Africa with Mike Mann. We each gave two papers at an International Coal Conference and met with faculty from North-West and Witsersrand Universities to set up graduate student exchange programs (see page 5). Graduate students can spend up to one year at the partner university conducting research with all expenses paid! Oh yes, we also got in some sightseeing, including a trip to Kruger National Park. At Kruger we saw all of the “big 5” (Elephant, Cape Buffalo, Rhinoceros, Lion, and Leopard) and many more. My favorite is shown in the photo.

I also travelled to both San Jose and Pomona in California. Both cities host California State University system schools. We established a partnership with each school that we hope will help us attract high quality students to our graduate program. We have an acute shortage of qualified graduate students, even though we offer free tuition and assistantships to cover living expenses. This is a symptom of the overall shortage of chemical engineering students nationwide, coupled with high starting BSChE salaries and low unemployment rates. As part of this new partnership, three undergraduate students from Pomona participated in this summer’s NSF-sponsored Research Experience for Undergraduates at UND (see page 8).

If you are in North Dakota or surrounding regions and watched the opening ceremonies or other events of the Olympics on NBC, you may have seen a familiar face during one of the ads. Wayne Seames and a group of his students were selected as one of three UND research groups to feature during ads promoting UND. Dr. Seames was selected due to his work in the development of biojet fuel from crop oils. Along with 20 students working on chemical engineering projects this summer, Dr. Seames was filmed at a UND Aerospace hanger at the Grand Forks airport in front of UND’s newest training plane.
Kayla Johnson, a 2007 UND Chemical Engineering graduate, is featured in this Missouri newspaper article.

**AT WORK WITH . . .**

Brewer-to-be is getting well-rounded training

By Jeremiah McWilliams

Kayla Johnson jumped straight from college into brewer's boots.

The 23-year old native of Devils Lake, N.D., has worked since June at Anheuser-Busch Cos.' Research Pilot Brewery, a small testing, product-development and training facility tucked into the company's giant complex in south St. Louis.

Her training as a group manager is an early step toward launching a brewing career at one of Anheuser-Busch's 12 U.S. breweries.

The training - designed to get hands dirty and feet wet - includes managing yeast, refining taste buds and brainstorming a new beer (in Johnson's case, a caramel apple porter).

**Are you the envy of all your friends now?**

Absolutely. They think that I have the coolest job ever.

**Was this a long term-goal, to get into the brewing industry?**

Growing up, I had a best friend whose family distributed Bud. So it's always been a very respectable company in the community. I got involved in school, and I was really looking for something in food science. I did a nine-month internship with Anheuser-Busch (in corporate engineering during her junior year of college). This place is great. I learned a lot about brewery design and what it takes to design an A-B facility. . . . It really struck my interest.

**What's a typical day?**

There is not a typical day. We've got a few different areas. We've got the brewhouse, fermenting, the beech-wood aging cellars, filter and packaging. We spend a few months in each area. So right now I'm in brewhouse. We're in charge of writing recipes, all our raw material management, like weighing out hops, what grains do we need. We're in charge of all our programming. I'm getting transferred next month while we're starting fermenting. Then I'm in charge of yeast injection. Then I'll probably go down to the beech-wood aging cellars. . . . It's a day of trouble-shooting every day.

**What's your favorite part of the job?**

Tasting. (Laughs) We taste beer at every step of the process. We'll taste the wort right after it comes out of the brewhouse, we'll taste right after alpha fermentation . . . we'll taste it before it's filtered, after it's filtered. And I think it's very important to see how our process is going, what needs to be changed.

Our bosses don't micromanage us at all. It's our responsibility to hit our targets, and it's also our responsibility to explain why we didn't hit them. We take complete ownership of what goes on in our area.

**By targets, you mean quality?**

Both quality, and hitting color targets. Make sure it looks good. In fermenting, make sure the right amount of yeast is added.

**Did your degree (in chemical engineering at the University of North Dakota) lead into this pretty well?**

Is that a pretty tight match, or is it all new?

I think it's a very good background education. Brewing is an art and a science. It's not really something you can learn in school. It's something you experience at work.

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Hello again. I am sure all of you have been waiting anxiously to hear what exactly has been happening with Dr. Muggli this past year. Questions such as the following have been tormenting many of you: Did that high-throughput reactor pan out? What were the exciting highlights from statistics class? Doesn’t he have something like ten kids now? Well, in a few short minutes of reading, you will have the answers.

I continue to teach the junior chemical engineering laboratory, undergraduate and graduate statistics, and engineering ethics. I am looking forward to a slightly modified teaching schedule this year, as we are making some improvements in the curriculum. First off, those of you who have mocked the long-winded ethics course title (The Role of Engineers and Applied Scientists in a Global Society), will no longer have reason to laugh. The new course title is shorter, better, with no global society - and just for an element of revenge to those course-title detractors, I will not give out the new course title just yet. You’ll have to wait for next year’s letter (I like to put one big cliffhanger in my letters each year…keeps ‘em coming back, you know). Anyway, this spring I will be teaching a new three-credit course on statistical and numerical methods. I am excited to expand the statistics in the undergraduate curriculum and teach some of the numerical methods that are useful to chemical engineers.

Research is going very well and is keeping me quite busy. We are continuing to work in photocatalysis, based on the NSF award we received last year. For that project, we built a high-throughput reactor that allows us to increase our catalyst testing productivity by a factor of about twenty. I just recently presented the results of this research at the International Congress on Catalysis in Seoul, Korea and I was pleased with the interest in it. Currently we are preparing two papers for publication in this research area. The success of this work is due to my industrious graduate student, Jordan Grasser, and his many minions of undergraduate helpers (Ben Stover, Mitch Olsen, Steve Bierschbach, Jakob Kaup, John Grabanski, and high-school student Danielle Thomas). One of our recent M.S. graduates, Chris Flakker, won the university’s award for most outstanding master’s thesis for his work in photocatalytic oxidations in a fluidized bed reactor (see page six).

In another research area, we are looking at catalytic reactions pertaining to biofuels (cracking, aromatization, alkylation, etc.). I’ve been co-advising students with Wayne Seames under a grant from the FAA as well as with a joint project with the EERC. We have some very nice results from the work of two soon-to-be M.S. graduates, (Swapnilkumar Ghandi, and Swastika Bithi). I am looking forward to publishing their results once we have made sure to protect the intellectual property contained in their work.

On a personal note, my wife Dina and I were excited at the birth of our newest daughter on September 9 of last year. Now at 10 months old, she is crawling, pulling up on furniture and is amazingly ready to give hugs to just about everyone who holds her. Her sisters, Alissa, Naomi, and Gianna are very excited that she is part of our family and her brother, Louis, can’t keep away from her.

Department establishes graduate partnership with two South African Universities

U.S. Chemical Engineering graduate students enrolled at UND can spend 6-12 months, all expenses paid, at North West University or Witwatersrand in South Africa thanks to a new program established by the department during the past year. Faculty at these universities conduct sustainable energy research that complements the work we are doing in our department. The research performed will count towards the students thesis or dissertation.

Under this exchange program, South African students will be coming to UND as well. We hope to be able to host our first South African students this coming year.
Christopher Lee Flakker received the University of North Dakota’s 2008 distinguished thesis award during an April 28th ceremony held at the Ina Mae Rude Center. His thesis entitled, "Determination of Key Parameters Affecting Titanium Dioxide Activity, Carryover, and Attrition in a Fluidized Bed Photoreactor" earned him a master's degree in chemical engineering under the guidance of Darrin Muggli. It also earned Flakker a place in the UND Graduate School’s hallmark hall.

Chris is the third UND ChE sponsored student to win a UND-wide outstanding thesis or dissertation award in the past four years. The other ChE graduates in this hallmark hall are April Hoffart ’04, M.S. and Yongxin Zhao ’06, Ph.D.
Another year has come and gone. It's hard to believe that I have been at UND five and a half years! It has been an exciting time to be in the department as we have continued to grow. We have added faculty and continue to increase our research. I firmly believe, however, that we continue to offer the same personal attention to the students which has been our hallmark. On a personal side, this past year I was promoted to associate professor and received tenure. I was extremely relieved to hear this as my wife would have done many unfortunate things to me if I made her leave North Dakota!

Life continues to treat my family very well. Our son is now 2.5 years old and is living up to the terrible twos! He is into absolutely everything and is talking up a storm. It really is amazing to see him develop and learn new things.

This year we made two purchases to take advantage of the beautiful summers – a camper and a fishing boat. We did what any good North Dakotans would do and parked them in northern Minnesota! We're currently on Bowstring Lake (60 miles ENE of Bemidji). We try to get out as much as possible.

The upcoming school year is rapidly approaching. This fall I am teaching Stoichiometry (my favorite class to teach) and a joint undergrad/grad materials and corrosion class. In the spring semester, I will teach Thermodynamics (everybody's favorite class to take) and a graduate level class in polymer engineering.

I have also continued to pursue research. My main interests lie in synthesizing new polymers with designed architectures and testing their properties. Although I am currently involved in several projects, the bulk of my research effort centers on producing new and improved polymers from agricultural products. A group of us (Drs. Muggli, Tande, and Seames) have recently been awarded a USDA grant to study the production of a number of polymers produced from various crop oils. I currently have three master's students and will be coadvising three Ph.D. students starting this September.

I had two students graduate with master's degrees. Dharmender Kumar graduated in November 2007, while Pratik Bhandari graduated in May 2008. I will also have several more students graduate within the next couple of months. I have continued to write research proposals and I've published one paper this year with two additional papers submitted for publication.

ChE Alum inducted into the SEM alumni academy

John T. “Jack” Crystal joined 33 other UND distinguished alumni last September, when he was inducted into the School of Engineering and Mines Alumni Academy. Jack graduated with a bachelor’s in 1969 followed by a master’s degree in 1970. He then went on to work at E.I. Dupont before being commissioned as an Air Force Officer. After serving four years, he settled down at Exxon where he spent more than 30 years of his career. At Exxon, Jack moved up the ranks quickly holding positions as a design engineer, senior advisor of worldwide polyolefins, and technology manager of Asia Pacific, polyolefins.
Native American Freshman Experience program held for the second year

Five students and one instructor from the United Tribes Technical College, were on campus in July for the Native American Freshman Experience Program, sponsored by the SUNRISE research initiative. This program, now in its second year, is intended to ease the transition from tribal colleges to UND and to expose students to research in the areas of sustainable energy and environmental science.

During the week-long program, students were assigned to a faculty mentor, in whose lab they spent time learning about research and conducting experiments. Later in the week, students worked with the PowerON student group, helping to design experiments for middle school students in rural North Dakota. While on campus, students also toured the Human Nutrition Research Center, the UND American Indian Center, the Center for People and the Environment, and the Energy and Environmental Research Center.

Partnering with Cal State Schools

Our department initiated a partnership program with two California state university campuses - San Jose State (SJSU) and Cal Polytechnic at Pomona (CPP). These are non-research intensive universities that have lots of students and lots of space, but limited funds and time for research. Under this program, research projects initiated at UND will be executed at SJSU by master’s students or CPP by undergraduate students. Faculty at the California schools will provide day-to-day mentoring, while overall project direction will be provided by UND faculty.

Faculty at CPP and SJSU will also help to recruit undergraduates to participate in the department’s Research Experiences for Undergraduates program jointly operated with UND Chemistry. This summer, three CPP students participated in the program (see photo). The overall goal is to increase the number of U.S. students who pursue graduate studies in chemical engineering at UND.
It's hard to believe I've been at UND for two years already - I feel like I just started. I guess time flies when you're having fun. My second year here was busy, but productive. I taught Lab IV, Transport Phenomena, and Separations at the undergraduate level, all for the second time. I also taught a graduate level transport phenomena class for the first time. Overall, I feel like I’m learning the ropes pretty well (thanks to several great mentors) and I really enjoy my interactions with our students.

In this upcoming year I'll have a few changes to my schedule. I’ll hand over both transport courses to Dr. Parker, who plans to redesign the undergraduate class from the self-paced format with which its been taught for many years. I’ve enjoyed many aspects of that approach and thought it taught the students valuable time management skills. But, I’ve also found that the students usually either really liked it or hated it, and often asked for more structured in-class time. I’m sure Dr. Parker will find a very effective happy medium. In exchange for transport, I’ll pick up Unit Ops next Spring and I’ll take on some of the material for Plant Design I next fall. I’m looking forward to both of these classes and hope to continue our high standards of teaching excellence.

Research continues to move forward in two primary areas. First, is our work studying architectural effects in polymeric membranes. After a longer than planned (isn’t it always?) learning curve, our group has now started to synthesize high quality membranes for gas separations and reverse osmosis. The first graduate student to work on this project, Irfan Shaikh, should be wrapping up his work and defending his thesis this Fall. An undergraduate student, Kyle Hellevang, worked on this project as part of the REU program this summer and will continue working this Fall.

My other primary research area is in biobased polymers and composites and is being performed in conjunction with the crop oil conversion program led by Dr. Seames. This work has gained some momentum over the past year and commercial interest in the project has grown. The USDA has awarded our group a three-year $370,000 grant to carry out this work and we have been busy this summer applying for more funds. Mitch Braegelmann has led the lab effort in this area and plans to complete his master's thesis in the Spring semester. Taking his place will be three Ph.D. students starting this fall. If you know Mitch, you’ll agree that three Ph.D. students are roughly the equivalent to one Mitch.

Mitch Braegelmann brings home a $2500 scholarship from the prestigious Tau Beta Pi Engineering Honor Society’s Laureates program. This scholarship program was established to award those with outstanding academic accomplishments, as well as considerable campus and community involvement. Mitch’s research in SUNRISE - a UND university led renewable energy program, his leadership skills as a football captain and his volunteerism spirit within his community was quickly recognized. He is only one of sixty Laureates to receive this honor since 1982. Currently, Mitch is working on his thesis titled “Separation and Purification of Fatty Acids from Cracked Crop Oils”, and plans to graduate with his M.S. this Spring.
Dr. Steven Benson joins the Chemical Engineering department as our eighth faculty member on October 1, 2008. Funding for Steve’s position comes from our SUNRISE research programs.

[robin—insert Q&A and picture for Steve here]

SUNRISE Continues to Grow

In 2004 the UND Chemical Engineering and Chemistry departments jointly formed the Sustainable Energy Research Initiative and Supporting Education group. The group continues to grow and today includes 25 faculty members in 12 separate departments at four North Dakota University System Institutions. SUNRISE research is focused in three areas:

1. The conversion of crop oils into fuels, chemicals, and Polymers
2. Technologies for the sustainable use of coal
3. Technologies to harvest energy from diffuse sources (wind/solar/hydrogen)

SUNRISE Renewables (see page 6) was formed as a spin-off company from SUNRISE in order to develop and commercialize SUNRISE crop oil conversion technologies.

All seven current ChE faculty members participate in SUNRISE and ChE Professor Wayne Seames is the Director of the group. Since 2004, SUNRISE has been awarded over $25 million in research and commercialization funding. Over 150 students have worked on SUNRISE research as part of their educational experience.

Meet Steven Benson, ChE’s Newest Professor
Another busy year! I got to teach the same set of courses - Reactor Design, Unit Ops, Lab I, and Grad Separations - so I was able to focus on updating and enhancing the course material. Lab I students received a set of “good” and “bad” sample lab reports as examples of what to do and not do when writing a report. For some reason, writing the “bad” report was a lot more fun. In Unit Ops I finally remembered before, instead of after, the unit on mixing and agitation, that talking about mixers and blenders was a great excuse to make milkshakes in class. Reactor Design got a makeover as all my old handwritten notes got transferred into an electronic format that could be presented to distance students. This worked much better for the local students.

Over the course of the year, I took over from Dr. Seames as the ChE graduate program director and am learning all the intricacies of the admissions process, tuition waivers, and programs of study. Whoever knew the graduate school had so many different forms? I’m looking forward to the beginning of the Fall semester when I can meet the new graduate students that I’ve only gotten to know so far through application forms and emails. This Fall we’ll have new students from Cameroon, Ecuador, Kenya, India, and the United States. The food at this year’s grad party should be excellent!

My research also continues to keep me busy. Current research projects that students are working on include: atmospheric modeling of trace elements in coal combustion plumes (Chen Zhu), laboratory chamber measurements of trace elements from coal combustion (Sanjoy Bhattacharia), and aerosol size distribution modeling methods (Adam Mohs). Adam is my first student to graduate from UND, having recently managed to defend his M.S. thesis, get married, and start a new job with Hutchinson Technology all within a few weeks time. I’m also continuing to work with faculty in the department of Teaching & Learning to create an educational air pollution computer game for middle and high school science students.

Two members of the team were awarded promotion and/or tenure. This is a recognition of the high level of excellence of each faculty member and of the Department as a team of engineering scholars committed to excellence in teaching, research, and service activities.

Dr. Wayne Seames was promoted early to full Professor.

Dr. Edward Kolodka was promoted to Associate Professor and awarded tenure.

The practice of awarding tenure to faculty is an ancient and highly respected practice amongst the world’s leading universities. Faculty must demonstrate, over a period of time, that they have the capability, ability, and motivation to meet acceptable levels of achievement in teaching, research, and service activities. Tenure provides faculty with the freedom to pursue scholarship in the manner they feel is most appropriate, without fear of losing their position. It does not give faculty the right to engage in incompetent teaching or research nor to engage in criminal or other inappropriate activities. For engineering faculty, tenure is a vote of confidence from the University that they will continue to strive and achieve excellence in academic activities.
FACULTY PUBLICATIONS


Note: UND ChE Students in italics

FACULTY RESEARCH HIGHLIGHTS

- Wayne Seames and Brian Tande received $110,000 in funding from the North Dakota Soybean Council for 2007/08 research associated with fuels, chemicals, and polymers from soybean oil.

- Ed Kolodka received $13,397 from the UND Faculty Seed Grant Program for his project, “Preliminary Investigation of the Synthesis of Commodity Polymers from Crop Oils.”

- Wayne Seames, Darrin Muggli, and Brian Tande received $400,000 from Bayer CropSciences to study the conversion of canola oil to fuels, chemicals, and polymers.

- Frank Bowman received funding from the Electric Power Research Institute (EPRI) and a UND Graduate Research Summer Professorship to study the atmospheric transformations of trace elements released during coal combustion.

- Michael Mann and Hossein Salehfar were recently awarded a $300,000 contract by the Department of Energy. The main emphasis of their grant, “Development of a Renewable Hydrogen Production and Fuel Cell Education Program” will be to develop case studies and laboratories to enhance the undergraduate curriculum.

- Brian Tande, Wayne Seames, Ed Kolodka, and Darrin Muggli were awarded a three year, $367,000 grant from the U.S. Department of Agriculture to develop polymers and composites from crop oils. The program, titled “Bio-based Polymeric Materials from Cracked Canola Oil” will focus on converting canola oil into several polymers commonly used in building materials, coatings, adhesives, and many other products traditionally derived from petroleum or natural gas.
Reginald Parker, Assistant Professor

During the past 12 months, I can best describe my experiences as challenging mixed with innovation, production and collaboration. Last year, my wife Robin and I moved here from Tallahassee, Fla. And so, the move and acclimating to N.D. was a challenge. Surprisingly, we learned quickly the importance of a good pair of long johns and a remote starter.

I have seen innovation in terms of research and classes. In the Fall, I taught chemical engineering dynamics and process control and Lab III during the Spring. In process controls, we designed controls for a carbon nanotube reactor. In Lab III we added several new experiments, which exposed students to state of the art technology. This includes: new materials in dye sensitized solar cells, the use of piezoelectric materials as an energy source, and electric discharge treatment of composite materials. I look forward to adding transport phenomena to my course load this semester.

The research group has been productive. I had my first UND master’s student, Dennis Sisk graduate. Dennis’s thesis entitled "Design Requirements of a Sustainable Habitat for Off Grid Operations" examines the use of solar in developing countries including Zimbabwe, China and Mexico, as well as in space habitats. I also enjoyed working with six undergraduate students. It was very inspiring to see so many young minds truly intrigued by developing technologies and strategies for solar technology.

It was good to work so closely with students as a mentor, advisor and a professor. This is the hallmark of being a UND-ChE faculty. Coming to UND from another University, I was impressed at the quality of this program, the personal attention given to students and the camaraderie among faculty.

I am looking to graduate my second M.S. student this upcoming Fall semester who’s thesis work is on optimizing a nanobiocomposite dye sensitized solar cell.

The atmosphere of innovation and productivity has been enriched through my collaboration with outstanding UND faculty. Further, advising and teaching “knowledge hungry students” has proven to be a good fit for myself and my family. If this is what is known as “the same”, I look forward to more of the same.

GRADUATING M.S./Ph.D. STUDENTS

Adam Mohs, M.S. ChE, Aug. ‘08 Thesis: Eliminating Dispersion in Moving Center Sectional Method Aerosol Size Distributions; Advisor: Dr. Bowman

Dharmender Kumar, M.S. ChE, Dec. ‘07 Thesis: Understanding the Effect of Wood Swelling On the Failure Of Epoxy/Wood Bond Under Wet Conditions; Advisor: Dr. Kolodka

Pratik Bhandari, M.S. ChE, May ‘08 Thesis: EPR Modified PLLA For Food Contacting Applications”; Advisor: Dr. Kolodka


Greg Fix, M.S. ChE, Dec. ‘07 Thesis: Mechanisms and Environmental impact of fine fragmentation of coal fly ash, Advisors: Drs. Seames and Mann

Gopal Bandyopadhyay, Ph.D., Dec. ‘07 Dissertation: Ground Heat Exchangers: Analytical and Numeric Modeling and Experimental Verification; Advisor: Dr. Mann

Prasad Chavan, M.S. ChE, Dec. ‘07 Thesis: Performance Evaluation and Emissions Characterization of Biojet Fuels Dervied form Soybean Oil and it Derivatives in a Gas Turbine; Advisors: Dr. Mann and Dr. Seames

Mohammed Hussain, M.S. ChE, Dec. ‘07 Thesis: Testing of Lithium Silicate and Hydrotalcite as Sorbents for Carbon Dioxide Removal from Coal Gasification; Advisor: Dr. Mann

Michael Dennis Sisk, M.S. Env. Eng., Aug. ‘08 Thesis: Design Requirements for a Sustainable Habitat for Off grid operations; Advisors: Dr. Parker, Dr. Gullicks, and Dr. Mann
Tom Owens Endowed Chair Fundraising Campaign

As most of you are well aware, Tom Owens had, during his long tenure at UND, an extraordinary impact in the lives of the engineers that were trained as students in this department. His impact was recognized with numerous honors, culminating in 2000 when Tom was selected as the North Dakota Teacher of the Year for being the most outstanding undergraduate instructor in the state. Tom was more than just a teacher, he was a mentor, a coach, a cheerleader, and sometimes a father-figure for the students he trained and also for the faculty who served with him during his tenure as Chairman of the Department.

A few years ago, the department decided that the best way to honor Tom in a lasting way was to create an endowed chair in his name. The chair position named after him would not only be a tribute to Tom, but to his ideals. It would be an engraved reminder of the contributions from this remarkable individual.

When fully funded, this endowment would allow us to add an additional faculty member. As former President Kupchella used to say, when you endow a scholarship, you impact the life of one student. When you endow a faculty chair, you impact the lives of hundreds of students.

This dream will only become possible with your help. Our goal is to raise $3 million, which would support a position in perpetuity. Currently, we have raised $273,433 with another $9200 in pledges. We still have a long way to go. We need everyone’s help to be successful. Please be as generous as you can! If it would be more realistic for you to pledge an amount over 3-5 years, instead of giving one lump sum, that would be fine.

Thank you, for your continued generosity and support of this fund.

For further information concerning the Tom Owens endowed chair in Chemical Engineering please contact Kristi Brindle at (303) 888-8317, risti@heftagroup.com, Deb Austreng, Development Officer at (701) 777-4838, debaustreng@mail.und.edu, or the Chemical Engineering department.

Mann appointed as Interim Dean

With the retirement of John Watson as Dean of the School of Engineering and Mines, ChE Department Chair Michael Mann filled in as Interim Dean of the School of Engineering and Mines April 1st to June 30th.

Dr. Mann previously served as a Group and Project Manager at the EERC, where he supervised groups ranging in size up to 29 professionals. In his appointment announcement, UND Provost Greg Weisenstein said this about Mike, “As an accomplished teacher, researcher, and manager, we are delighted that Dr. Mann has agreed to serve as Interim Dean of the School of Engineering and Mines. He is a highly respected faculty member and department chair in the School, and brings a wealth of talent to this critical leadership position.”

Seames Delivers UND-Wide Lecture

Wayne Seames was selected as the featured speaker at UND’s prestigious 17th annual Elwyn B. Robinson Lecture. The Robinson Lecture series began in 1991. The Lecture, together with the Library’s compilation of a bibliography of faculty and staff publications, is designed to recognize the scholarly and creative accomplishments of the UND community.

Dr. Seames’ talk was entitled “Energy and Modern Human Civilization”.

Shown here from left: Director of Libraries Wilbur Stolt, former President Charles Kupchella, and Professor Seames.
undergraduate enrollment continues to grow. We have been aggressively recruiting both new freshman and transfer students. This year’s enrollment numbers are up by 19 students. We hope to continue increasing these numbers to provide you with a larger pool of students to make your hires. This year, I have had to tell a number of you when you were recruiting: “Sorry, we don’t have any graduates for you”. On the positive side, this reflects full placements of our graduates.

We continue to promote experiential learning for our students. More than 85% of our graduating seniors during the past three years have been involved in either co-ops, internships, or sponsored research programs. We continue to stress the importance of obtaining and promoting work experience with our students. Thank you to those of you who helped create these opportunities.

Our research program continues to grow as indicated by significant increases in research expenditures, publications, and student involvement. A strong research presence combined with our reputation for excellence in teaching is critical in establishing the UND Department of Chemical Engineering as a UND Signature Program. By improving our national reputation, we can enhance our ability to recruit top-notch students and faculty, improve employment opportunities for our students, and continue to attract funding to support the department’s mission.

On a personal note, I have been continuing my research in renewable and sustainable energy. Projects for this year include hydrogen production through hydrolysis, modeling of a new gasifier design, greenhouse gas inventory for the City of Grand Forks, and involvement in the development of our crop oil refinery.

I have been involved in two new committees focused on climate change. The Green³ Grand Forks Resource Committee was formed by Mayor Brown in response to the city’s signing of the Mayor’s Climate Protection Act. The second, the Council on Environmental Stewardship and Sustainability was formed by President Kupchella in response to his signing of the American College & University Presidents Climate Commitment. By signing these agreements, both the city and the campus have agreed to make substantial reductions in their contribution to greenhouse gas emissions. I have been working with the committees to develop action plans.

I also spent 4 ½ months as interim Dean, bridging the gap from April 1st when John Watson retired, until August 15th when Hesham El-Rewini took over as our new Dean (see page 1). While this took a lot of time away from the department, it helped me gain a better perspective of how things work on campus. This experience will be useful as we continue to move the Chemical Engineering Program forward.

Thank you for your continued interest and support of the department.

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**Industrial Advisory Committee**

As part of our quality assurance program the Department uses a diverse group of Alumni as an advisory committee which meets every two years to review the Department’s activities. Current members of the Advisory committee are:

- Dr. Tom Owens, Committee Chairman, Professor Emeritus, UND Chem Eng
- Christopher Campbell (BSChE ‘02), Ph.D. Northwestern University
- Tom Erickson (MSChE ‘90/BSChE ‘88), UND/EERC
- Dylan MacClean, (BSChE/DEDP ’03), Blandin Paper
- Claudia Miller (BSChE ’86), Dakota Gasification Company
- Fred Moesler (BSChE ’89), Cargill-Dow
- Kathleen Spilman (BSChE ’81), KEITU Engineering
- Joann Lighty, Chair of Chemical Engineering, Univ of Utah
Meet Deb Austreng, SEM Development Officer

It is my honor and privilege to introduce myself to you as your development officer for the School of Engineering and Mines. I work closely with Dean Hesham El-Rewini, and regularly engage with chemical engineering faculty, staff and Department Chair Mike Mann.

As a Grand Forks native, UND is ingrained in my heart as it is for many of you. It is this community that I have made my life home, along with my work home at the School of Engineering and Mines.

During my first year, I’ve come to understand that the faculty and alumni share my love for North Dakota, and it's people and the excellent opportunities for education that abound here at UND. I have also learned that within the School of Engineering and Mines are talented students and faculty who are driven to create solutions to the world's most pressing problems related to the earth, energy, materials and environment.

Gifts to The School of Engineering and Mines allow our students and faculty to take on the important challenges that inspire them. State funding alone can no longer support the advanced technology and expertise required for the experiential education and innovative research that make SEM distinctive. Private gifts enrich the educational experience and provide scholarships, classroom and laboratory equipment, faculty development, academic programs, new facilities and student activities.

I would be honored to guide you in any way you'd like to be involved with the School of Engineering and Mines Department of Chemical Engineering. I know you have read through this newsletter and see that there is so much happening here. This department is making an impact in so many lives. Please feel free to call, email, or stop in to visit when you are back on campus. It would be my pleasure and honor to get to know you.
SPRING 2008 B.S. ChE GRADUATES

Top Row: William Line, Wade Morman, Matthew Johnson, Jacob Lee, Thomas Finneman, Thomas Hansen, Mitch Braegelmann
Bottom Row: Jordon Hauge, April Wright, Leah Millner, Becky Gill, Sara Stroh, Elizabeth Anderson, Chad Haugen

(Chris Henry not shown)

December 2007 B.S. ChE Graduates
Andrew Rye and Tyler Bohan

CHEMICAL ENG ASSOCIATED
MERIT AID SCHOLARSHIPS

Spenst Wendy Sellheim Mem Endowment ($500 each)
Elizabeth Anderson, Alexa Azure

Kube Mem Chem Engineering Scholarship - $250 each
Ben Stover, Travis Waind, Bill Line, Jordon Hauge

Cooley Albert ChE Scholarship
Kyle Hellevang ($500), Chad Haugen ($300), Bryce Harrison ($400)

Gullekson E. E. ChE Scholarship:
Karen Eskelson ($400), Rebecca Gill ($400), Mitchell Olson ($400)
Jakov Kaup ($200), Steven Bierschbach ($200)

Severson Scholarships - $900 each
Stacy Bjorgaard, Jennie Jorgenson

Leach Scholarship - $900
Max Melmer

Wolff Scholarship - $1000
Leah Millner

Golde Scholarship - $750
Paul Millner

On behalf of the faculty and students, we would like to express our sincerest appreciation for the scholarship funds set up by the alumni and friends of ChE and SEM. As tuition costs continue to rise, along with fees and books, our ability to make meaningful scholarships to our students decreases. If you are thinking of contributing scholarship monies, please identify the funds as directed towards students in ChE if you want to insure that you are supporting the next generation of engineers.
Alumni Contribution Report

Thank you for your contributions to the department. They allow us to do so many things that would otherwise not be possible. Most of our endowments took a hit with the decrease in the stock market, so your donations were doubly appreciated this year. As you can see by the report, a major portion of our alumni funds were used to help Drs. Tande and Parker get established at UND. We were also able to make substantial improvements to the Souby Lab (the undergraduate computer lab) adding six new machines and upgrading their printer. We continue to provide scholarships through the various endowments so graciously supported by our alumni. We thank you and hope you will continue your generous donations.

Donations
- ChE discretionary fund $14,927
- Scholarship funds $3,250
- Owens Foundation $54,341

Investment Results
- Other general endowments ($8,342)
- Scholarship funds ($26,365)
- Owens Foundation ($7,191)

Expenses
- Scholarships (ChE administered) $6,700
- New faculty start-up $25,000
- Cost share on grants $2,500
- Software / Aspen $2,500
- Souby Lab / computers $8,000
- Department equipment upgrades $3,000
- Other/Misc. $4,193

Our thanks to the following individuals who made contributions supporting the UND ChE department this past year. Your donations go a long way in helping us meet our educational mission.

If you intend to donate to the Chemical Engineering Department and/or a specific need within the department, please note that on your donation card or attach a note to ensure your gift is designated for the department and/or the need you wish to support. If you made a donation but are not listed here, please feel free to contact us at one of the numbers/addresses below.

Thank you!

Joseph Amos
Julie J Edwards
Kristi Jean
Kristine Brindle
Lawrence Mann
Leonard Greenberg
Lisa Pagel
Mark Jesh
Mark Thoma
Marvin Cooley
Mary Hilpisch
Michael J Pedersen
Michael Vetter
Mike Mann
Muhammad Amanullah
Norman H Hoffman
Paul Fry
Paul Havig
Peter Wiederoder
Raju Natarajan
Randal S Sauer
Richard Peloquin
Richard Westberg

Robert Brugman
Robert Ness
Ronald Lehrer
Rose Forbes
Rosemarie Scanlan
Ryan Popinga
Sandra L. Weekley
Sarah Bradford
Scott Larson
Scott Shleiff
Sheila Galegher
Sonia Jacobsen
Steven Erhardt
Sumitra Ness
Theo Kestner
Thomas Owens
Timothy Bohan
Timothy Meland
Timothy Narum
Virginia Franta
Wayne Seames
Winton Bakke

2007 - 2008 ALUMNI CONTRIBUTORS

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mikemann@mail.und.edu

Deb Austreng: 701-777-4249
debaustreng@mail.und.edu
DEPARTMENT OF CHEMICAL ENGINEERING

UPDATED INFORMATION

Please stay in touch! Remember, UND/ChE alumni’s never really leave the Department after graduation, they just do less homework!

NAME: __________________________

UND Degree/Year: __________________________

EMPLOYER: __________________________

email address: __________________________

Home Address: __________________________

Work Address: __________________________

Home Phone: __________________________

Work Phone: __________________________

Check here if you would like someone to contact you with more information about contributions supporting the Chemical Engineering Department or the Tom Owens Endowment.

Please send to: Department of Chemical Engineering
departmentofchem@und.edu

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