

# UNK



Published Fall 2015

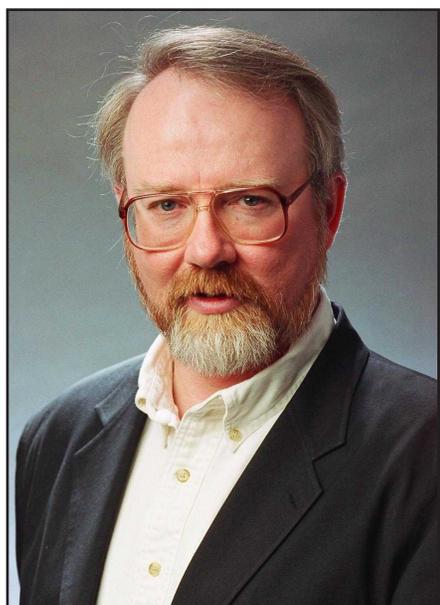
## 2015

## Letter from the Department

In the past year, we have added Prof. Allen Thomas to the department, as our fourth organic chemistry professor and our 11th member of our department. We are excited that he is here and on page 3 you can get to know him better. We have been busy adding new instruments to our department; we have purchased an ITC (isothermal titration calorimetry) and HPLC prep. (high pressure liquid chromatography preparation) instruments. The HPLC prep will be used to clean up samples that are synthesized, such as Dr. Thomas will be using it to clean up samples that are going to be used for Alzheimer's research. The ITC is used to examine how small molecules are bound to larger biomolecules such as proteins. Dr. Amanda Glass will be using this instrument for her research with proteins. Additionally, we have 3 professors that have secured funding this past year: Dr. Amanda Glass was awarded the EPSCoR FIRST award, Dr. Mahesh Pattabiraman was awarded the ACS Petroleum Research Fund, Dr. Hector Palencia was awarded the Undergraduate Research Experience at Small Colleges and Universities, and Drs. Scott Darveau and Chris Exstrom were awarded EPSCoR NASA Space Grant award. Finally, our latest success rates for the last ten years for students getting into post secondary schools for health science related fields (Medical, Dentistry, Pharmacy, etc.) is 93%. Congratulations to all of our students!



Dr. Scott Darveau, Chair of the Chemistry Department



## Don Fox Lecturer, Fall 2014

**Alan Luedtke, Ph.D.**

Alan Luedtke obtained his undergraduate degree in chemistry from UNK in 1977 and his graduate degree in physical organic chemistry in 1983 from the University of New Orleans. After graduation he worked at the U.S. Food and Drug Administration Natural Toxin Research Center, DuPont Fibers, INVISTA, and Innovative Chemical Technologies. He gave a presentation entitled "Commercial Chemistry - is there anything interesting in it...other than money?"

In his presentation, he went over the research he has been involved in over much of his career in industry such as expanding the analytical capabilities of the Innovative Chemical Technologies, development of new specialty coatings and novel fluorosurfactants, and understanding the physical chemistry of stain resist agents for polyamide fibers.



## Chemistry Club Picnic



Our chemistry club picnic was held on Aug. 28, 2014 in Harmon park. Left picture: (starting from right) Nick Ellis, Jeramie Jergins, Dr. Cao, Dr. Glass, and Andy Glass. Center picture: Dr. Thomas, Dr. Pattabiraman, Dr. Palencia, Dusty Broxterman, Kevanie Damit-Og. Right picture: Bethany Lueck, Aspen Clements, Dr. Exstrom

## Meet a Graduating Senior

### Aspen Clements

Aspen is a UNK Chemistry major from Gering, NE who became interested in chemistry in high school. Her high school chemistry professor was “phenomenal” and taught applied chemistry in creative and interactive ways.

#### Memories and Research at UNK

One of her most memorable UNK chemistry moments was coming to the realization that electrons are not simply “particles” orbiting the nucleus. During her undergraduate career in chemistry, she has been very active in research. Working with Drs. Exstrom and Darveau, she has participated in their Solar Cell research by synthesizing and characterizing iron pyrite. She also worked on a project with Dr. Pattabiraman where she used cyclodextrin to create a stereospecific chemical environment to generate heterodimerization reactions.

#### Additional Research

Away from UNK, she participated in a Research Experience for Undergraduates at New Mexico Tech where she worked with the National Radio Astronomy Observatory. Here she studied the Sagittarius B2 Super Cluster in the center of the Milky Way by looking at vibrational excitation of deuterated ammonium and using this to study the formation of stars.

#### Future Plans

This past Fall, Aspen applied for graduate school where she would like to study astrochemistry with an emphasis on chemistry. She has been accepted at the University of Arizona, University of Illinois Urbana-Champaign, and the University of Virginia (her top choice).





## Meet our New Faculty Member

### Prof. Allen Thomas

Where are you from? I'm originally from the North Texas area, near Dallas. We moved around a bit growing up, so I don't really have any one town in Texas that I call home, other than Dallas. However, I lived near Boulder, Colorado for the past 14 years before moving to Nebraska, so that area feels quite a bit like home, too.

What was your favorite part about working in industry? Other than the salary? Seriously, I enjoyed the team work. No one worked in a vacuum there, as we all depended on each other to move projects along. Also, working with highly talented scientists to solve challenging problems was a constant learning experience.

What are your favorite things to do when you are not in the lab or teaching? I enjoy running for exercise. My wife and I watch a lot of movies and a few TV shows. Cooking is probably the hobby of

which I'm most proud. I fix some kind of fancy dinner at home at least once a week. I took a BBQ course to become a "BBQ master", and I've been told to open a restaurant by former coworkers and friends.

Maybe if teaching doesn't work out....

What is your favorite part about being a professor? So far, I'd say it's the feeling I have when the class is "getting it".

#### Research Summary

My research interests are still evolving as I transition from industrial research to academic. I'm currently interested in drug delivery across the blood-brain barrier. One of the biggest challenges in treating brain diseases is getting drugs into the brain to do what they are supposed to do, because the brain is pretty good at keeping toxic molecules out. My research is focused on making molecules that mimic natural amino acids, which easily cross the blood-brain barrier, in order to use these mimetics to deliver drugs to the brain. You can think of it as a Trojan horse approach to sneaking drugs into the brain.



## Recognition of Our Graduates

Students listed have a Chemistry major or minor. Students that graduate with a Chemistry major have an asterisk (\*).

### Fall 2013

Tyler Lee; Doniphan, NE\*  
Morgan Strand; St. Francis, KS\*  
Alexander Harness; Kearney, NE  
Lingyun Yang; Kearney, NE\*  
Kyle Smith; Blair, NE

### Spring 2014

Angela Bamesberger; Kearney, NE\*  
Noah Broekemier; Central City, NE\*  
Noland Broekemier; Central City, NE\*

### Spring 2014 Continued

Adam Kahle; Dorchester, NE  
Sean Nelson; Kimball, NE\*  
Richard Poppe; North Platte, NE  
Andrew Sankey; Kearney, NE  
Mengnan Wang; Kearney, NE\*

### Summer 2014

Wendi Mao; Hengshui Hebei\*  
Zach Porter; Kearney, NE\*



## Recognition of Our Graduates Continued

Students listed have a Chemistry major or minor. Students that graduate with a Chemistry major have an asterisk (\*).

### Spring 2015

Ryan Callan; Ord, NE\*  
 Aspen Clements; Kearney, NE\*  
 Kevanie Damit-og Quintero; Kearney, NE\*  
 Colby Douglas; Kearney, NE  
 Lonnie Filip; Kearney, NE\*  
 Tad Fuchs; Kearney, NE  
 Michael Hanrahan; Kearney, NE\*  
 Lauren Hoeft; Kearney, NE\*  
 Anthony LaRosa; Grand Island, NE\*  
 Shanna Leise; Kearney, NE  
 Bethany Lueck; Kearney, NE\*  
 Taylor McPeak; Kearney, NE  
 Molly O'Brien; Kearney, NE\*

### Summer 2015

Jesse Houdek; Chapman, NE\*