



THE DEPARTMENT CHAIR

Barrett (Barry) Eichler
Our last newsletter was written during the 2014-15 year (sorry about that), but we have been extremely busy since that time. I have been teaching my usual General Chemistry (Chem 116 and 117) and Inorganic Chemistry (Chem 222 and 341) over the past few years. I have also taken care of the Trustee's Fellows in Chemistry class, where we have performed chemical demonstration shows for prospective students for the last few years.

My research took a good turn this last summer in that my students and I developed a method to attach DNA and RNA to fluorescent quantum dots for prostate cancer detection. For years, we struggled to attach the two, but we have now found a method that is reliable and easy. This work could extend to work with antibodies and viruses. Next summer, I plan to work with cells (look what Augie has done to me – I am an inorganic chemist, for goodness sake!).

On a personal note, my family and I have taken vacations to northern Minnesota, New Orleans and Yellowstone over the past few years. My wife Kathy has moved a few doors down in the Humanities Building and added to her duties as the Humanities Division Coordinator - she is now also the Performing and Visual Arts Coordinator. Our daughter, Maddie, is 9 years old and goes to Brandon Elementary, where she is in the Gifted Education program and plays the piano and violin. After the loss of two cats in recent

years, we adopted 2 new cats (Sasha and Luna) from the Sioux Falls Humane Society to go with our "senior" cat, Lucky.

DEPARTMENT

Personnel

We have also welcomed some new faces in the Department, so I invite you to read their notes in this newsletter. Dr. Cyndey Johnson-Edler joined us from SDSU in the Spring of 2016 and is currently serving as a laboratory instructor and as the campus-wide chemical safety officer. Dr. Satya Sadhu joined us in Fall 2016 also from SDSU as a two-year sabbatical replacement for Dr. Jared Mays and Dr. Jetty Duffy-Matzner. Dr. Anna George joined us this fall from the University of Wisconsin-La Crosse and has been hired as a Science Education faculty member and has a specialization in Chemical Education.

Froiland Science Complex

We are now in the second full year of enjoying our new building the Froiland Science Complex. If you have not seen it in person yet, please stop by for a visit – it is AWESOME! This last summer was the first year that I performed research in the new building and it was a wonderful experience. The classrooms are great to teach in and the building has served our purpose well.

Research

After a slight slow-down due to building construction for summer 2016, we are going

FROM THE FACULTY

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full steam ahead with our research endeavors. Summer 2017 had us working with 14 students in the Department and all of the students presented their research at the Sioux Valley ACS Local Section Meeting and Poster Competition in September, as well as the ACS Midwest Regional Meeting in October in Lawrence, KS. Yes, again we swept the awards (top 3) at the Sioux Valley ACS poster competition, with 5 out of the top 6 spots and 1 out of the top 5 spots at the Midwest Regional Meeting. We have great students at Augustana! We are also sending 7 of those students to the National ACS Meeting in March in New Orleans.

Instruments

Last year we purchased a Shimadzu differential scanning calorimeter and thermogravimetric analyzer (DSC-TGA). This instrument is used to detect things like solvent loss, conformational changes and even decomposition, and it is used a lot in the field of polymers. The Jeol NMR had a significant software update and a new computer was installed. We also purchased an Ocean Optics near-infrared (NIR) spectrometer (spectral range 1000-1650 nm).

Curriculum

Over the last few years, we underwent a "re-approval" process by the American Chemical Society (ACS) guidelines in order for our ACS Chemistry and Biochemistry majors to meet its standards. This was a long process, but we are now (pending official approval from ACS) in compliance with ACS rules with both of these majors. We are also currently reviewing the "Augie" Chemistry major curriculum. In collaboration with the Business Administration Department, we have also put forward a proposal for a Chemistry major with a Business emphasis earlier this year and we await approval from the Curriculum Council.

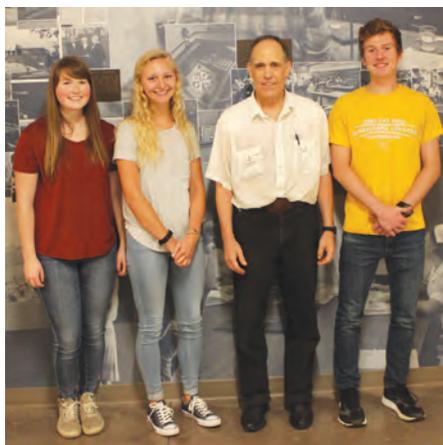
Duane Weisshaar

My Sabbatical Leave in 2015-16 allowed me to finalize the AA analysis method for Barry's quantum dots that Kim Stallings and Jake Dancler developed the previous summer. That work was published in the *Journal for Undergraduate Chemistry Research*. I also finalized the

procedures for several labs we are using in Chem 116 and 117, the 2 semester gen chem sequence. Summer 2016 I chose not to take on any research students as we prepared for moving into the new building.

After the Leave I resumed teaching my usual set of courses that now include the 2 semester gen chem. Teaching in the new space is great, especially labs. We are in our fourth year of teaching the 2 semester sequence and this is the first time we have not made some significant tweaks to the content split. Since Chem 116 students can go to either Chem 117 or Chem 145 (Survey of Organic and Biochemistry), the first semester is a bit different from a traditional Gen Chem 1.

Last summer I made the decision to retire from full time teaching at the end



Duane Weisshaar's research group

of this academic year. The Department is working with the VP for Academic Affairs to create a part-time Instrument Technician position for me that would allow me to still play with the toys. The Department has needed this position for decades, so hopefully it will materialize. The VP has said "things look promising", but nothing substantial has been laid on the table. We are also in the midst of a search for a new Analytical Chemist that we hope will be wrapping up soon.

Last summer I worked with three students: Alissa Runia, a senior chemistry major from Montevideo, MN; Hope Maunders a junior ACS Chemistry and Anthropology major from Sioux Falls, SD; and Alex Tietz a junior ACS Biochemistry major from Fort Calhoun, NE. They served as Departmental Lab

Assistants who worked half time with Brandon doing some marvelous reorganizing of the stockroom, and half time with me developing an x-ray fluorescence (XRF) method to analyze Barry's quantum dots (QDs). While the AA method works well, it destroys the QDs and takes several hours to complete. XRF can analyze the solid QDs non-destructively and in much less time. The tricky requirement is that the standards used have to have a matrix similar to the samples. We were able to generate reasonably linear calibration curves, but QD compositions determined from these curves were significantly different from AA results (>100% error). We suspect this is due to a matrix mismatch between the QDs and the standards. I hope to continue this work this summer (one last summer of research) attempting to find a matrix match and complete the method development.

Cyndey Johnson-Edler

Hello Vikings!

As Dr. Eichler indicated I came to Augie in the Spring of 2016 from SDSU as a temporary sabbatical replacement for Dr. Weisshaar. Since then I have successfully defended my dissertation and been fortunate enough to return to Augie to teach Chem 116 and Chem 145 labs and serve as the campus Chemical Hygiene Officer. My duties allow me to regularly interact with the wonderful students here at Augie (which I love!) and offer my previous Environmental, Health and Safety experience to the Risk Management Task Force. I have sincerely enjoyed the past almost two years that I have been a part of the Augie Chemistry Department and am looking forward to the coming year.

FROM THE FACULTY

Jared Mays

Greetings from Augustana! It's hard to believe that 2017 is almost over and another year of life in the Department of Chemistry is coming to a close. I spent the first half of 2017 completing a year-long research sabbatical, funded by a Faculty Fellowship Award through South Dakota BRIN. These studies built on the previous 8 years of work by my research group and continued our investigation of novel glucosinolates and isothiocyanates and their potential uses in combating cancer. Throughout the Interim and Spring Semester, I kept myself busy advancing a number of parallel laboratory projects and drafting a manuscript of work conducted by former group members Cody Lensing '12 (Mound, MN) and Elle (Tornberg) Anderson '14 (Harrisburg, SD), in collaboration with members of Peter Vitiello's research group at Sanford Research (Sioux Falls, SD). We are very hopeful that this manuscript will be accepted for publication in the coming months.

This past summer, research projects conducted by members of my group were successful in advancing several distinct sub-projects, both building on preliminary data I collected during my sabbatical. Claire Fanta '20 (Creighton, NE) and Katie Tlusty '19 (Waseca, MN) worked together on a project to prepare and evaluate a panel of substituted-biaryl isothiocyanates. Although both students were new to the Mays Group and undergraduate research, they proved to be quick learners and worked diligently toward their goal. By the end of the summer, their partnership resulted in a panel of 45 isothiocyanates, each of which required 4-5 synthetic steps. Somehow, we were able to squeeze in one preliminary round of antiproliferation assessment for 27 of these analogues and were excited by the resulting data. Work conducted by Carl Lang '18 (Lennox, SD) built on previous studies by Ellen Voigt '17 (Rapid City, SD) relating to the photochemical generation of isothiocyanates from non-glucosinolates. Carl was able to systematically evaluate several of the experimental variables and make

significant progress on the project! Together, these three students were a joy to work with and I was proud of all of their accomplishments, including: (1) Claire and Katie's 2nd place poster at the South Dakota Undergraduate Research Symposium (Pierre, SD), (2) Claire and Katie's 3rd place poster at the Sioux Valley American Chemical Society Symposium Poster Competition (Sioux Falls, SD), and (3) Carl's 2nd place poster at the Sioux Valley American Chemical Society Symposium Poster Competition (Sioux Falls, SD).

The past year has also involved significant alterations to Augustana's curriculum for the ACS Biochemistry major. My former junior/senior-level course, CHEM 330: Biochemistry & Medicinal Chemistry, was split into a two-course sequence. In Fall 2017, students enrolled in our first section of CHEM 305: Biochemistry, which we plan to offer yearly and serves as our foundation course in biochemistry. Then, CHEM 330: Medicinal Chemistry will be offered in spring terms and will build on the content from Biochemistry. This restructuring and expansion has required a complete overhaul of course goals and content coverage to provide a more cohesive and well-paced experience for our students.

This coming Interim, I will again be offering a course for Civitas, Augustana's Honors Program. This course was designed to address Bonhoeffer's theme of "pertinence" and is titled, "Taking Our Medicine?: An Evaluation of Drugs and the Pharmaceutical Industry." In this course, (prescription) drugs were the central focus and class topics provided the platform to understand and evaluate 1) the history of drugs, 2) drug development strategies and approaches, 3) considerations relating to the pharmaceutical industry (e.g. pricing, marketing, generics), 4) the nature of diagnosis and prescription, and 5) factors affecting drug use and abuse. This intentionally-interdisciplinary course was reliant on examining the multiple perspectives and considerations relating to the science of drugs, their role as a product or commodity, and the way(s) in which they reach patients and affect their behavior.

On a personal note, life outside the confines of Augustana remains as busy as ever! My wife, Jennifer, and our three children, Elliot (8), Aurelia (6), and Rosalind (4) are always on the run; between Taekwondo practice, gymnastics practice, (pre)school pickup/dropoff, and everything else, the days go by all too fast. We're all looking forward to the spring and being able to spend more time outside once the weather warms up!

Anna George

I had the privilege of joining the Augustana Department of Chemistry and Biochemistry this past semester after moving to South Dakota with my husband the previous year and spending that academic year at home with our, now two-year old son. Prior to moving to South Dakota, I was a member of the Chemistry and Biochemistry faculty at the University of Wisconsin-La Crosse as their chemical educator. Prior to earning my doctorate in Chemistry from the University of North Texas, I was a high school chemistry teacher in Plano, TX for 4 years and Joshua, TX for the year prior to that. I have earned baccalaureate degrees in both chemistry and biology with a master's degree in secondary education with certifications in gifted education and technical writing.

I am currently serving as the science educator for students interested in teaching science at the middle or high schools level. In this capacity, I taught the secondary science methods course as well as worked with Dr. Martha Gregg and Dr. Sun Li to prepare a grant application to the Noyce Program from the National Science Foundation. This project has the potential to provide to support to students aspiring to teach mathematics or science at the secondary level in their last two years of their academic preparation. In addition to working with secondary science majors, I also taught first semester general chemistry this term and am preparing to teach CHM 130 this January with Drs. Strandjord and Klose.

FROM THE FACULTY

Andrew Strandjord

I continue to teach Organics Chemistry (Chem201) and A Survey of Organic and Biochemistry (Chem145). We had over 90 students in Chem145 last spring and the numbers look to continue to grow as we increase the number of nursing and sports science cohorts at Augustana. The new chemistry labs worked out exceptionally well for both of these classes. The layout and organization made for a much improved learning experience for the students.

I will teach Chemistry in Our World (Chem130) again this Interim. This is a class for students who rarely (if ever) get over to the science building. We learn some general chemistry, organic, chemistry and biochemistry as it relates to everyday life in our world. Part of the learning experience for this class is to branch out beyond Augustana and see chemistry in action at several sites across Sioux Falls, including: Sanford Research, Poet Research, Fernson Brewery, and the Sioux Falls Crime Lab. This will be the last year I will be teaching this course because we are taking students to Germany during interim in 2019. We will spend 3½ weeks travelling across Germany visiting and leaning about the industrialization of chemistry (woohoo).

When I moved to Sioux Falls I purchased (online) a fixer-upper out at the edge of town. My wife and I are close to finishing up the "reclamation". Note: do not buy a house online without seeing it first in person! I also became a grandfather this year. My oldest daughter welcomed a son into the world this past November.



SMACS

The Student Members of the American Chemical Society (SMACS) have been very active over the last year. They built an award winning float for the Viking's Day parade, initiated several outreach programs to local schools and clubs, performed science demonstrations at a number of Augustana events, organized several social and fundraising events for members, and put on a panel discussion where former Augustana student came back to campus to describe opportunities in life and chemistry after graduating. This year's members includes a record number of first year students who are very active in the organization and are looking to increase the scope and participation within the SMACS group.



FROM THE FACULTY

Andrew Klose

I am the resident physical chemist, and as the newest (tenure-track) member of the department many of you may not know me - so I'll introduce myself! I am originally from Jamestown, ND, and earned my PhD from Michigan State University. After a stop as a postdoc at NIST in Boulder, CO, I came to Augie in the fall of 2015. In the classroom have enjoyed teaching physical chemistry, nuclear chemistry, and general chemistry. Andy Strandjord and are planning to each a study abroad course next interim: The History of the Chemical Industry in Germany. Andy is leading the charge, and I am happy to help get this exciting new course off the ground!

My research centers around precision laser spectroscopic measurements both on and off campus. Here at Augie, we perform cavity-enhanced spectroscopy for analysis of trace gases. Our group also collaborates with researchers at the National Superconducting Cyclotron Laboratory at Michigan State University where we are interested in laser probing of radioactive isotopes. I have enjoyed working with Augie students and getting the research activities up and going.

My wife, Kristen, and I have three girls, Brittany (5), Erika (3), and Natalie (2 months). As you can imagine we're very busy with the kiddos! We enjoy spending time outside, and with our extended family in the Sioux Falls area.

SIoux VALLEY SECTION OF THE AMERICAN CHEMICAL SOCIETY

The Sioux Valley Section of the American Chemical Society held their annual Undergraduate Chemistry Research Symposium at Augustana University this fall. ACS members from all across South Dakota and Southwest Minnesota attended. The symposium included a poster session for undergraduate research students, a panel discussion on post graduate opportunities, and dinner. The panelist included people from Sanford Research, the SDSU graduate program, and Poet Research. Augustana students won 3 of the 4 awards (and money) for best research posters.



A clean sweep of the awards



Faculty and students at the banquet



Chemistry Staff Contact Information

Jetty Duffy-Matzner

Organic

jetty.duffy@augie.edu
605.274.4822

Barry Eichler

Inorganic & Department Chair
barrett.eichler@augie.edu
605.274.4814

Anna George

Assistant Professor of Chemistry
anna.george@augie.edu
605.274.4817

Cyndey Johnson-Edler

Chemical Hygiene Officer
Chemistry
cyndey.johnson-edler@augie.edu
605.274.4712

Jared Mays

Medicinal & Biochemistry
jared.mays@augie.edu
605.274.4815

Andrew J.G. Strandjord

Organic Chemistry
andrew.strandjord@augie.edu
605.274.5496

Marlys Vant Hul

Natural Science Division Coordinator
marlys.vanthul@augie.edu
605.274.4710

Duane Weisshaar

Analytical
duane.weisshaar@augie.edu
605.274.4812

2018 CHEMISTRY ALUMNI FILE UPDATE

What's ν (nu) With You? Fill us in on what's happening in your life. If you find that any of the information mentioned in this newsletter is inaccurate, please let us know.

Name: _____
 FIRST MAIDEN MARRIED

Year Graduated: _____ Phone: _____

Address: _____

Email: _____

Occupation/Place of Employment: _____

Graduate/Professional School Preparation in Progress or Completed: _____

Personal News/Professional News you want us to know: _____

If you know of potential students for Augustana University, please provide us with their name, address and phone number so that we may contact them.

Name: _____

Address: _____

Phone: _____

Name: _____

Address: _____

Phone: _____

Mail to: **Department of Chemistry**
Augustana University
2001 S. Summit Ave.
Sioux Falls, SD 57197

Or email information to: marlys.vanthul@augie.edu