Grove City College Chemistry eNewsLetter

Fall 2015

Departmental News

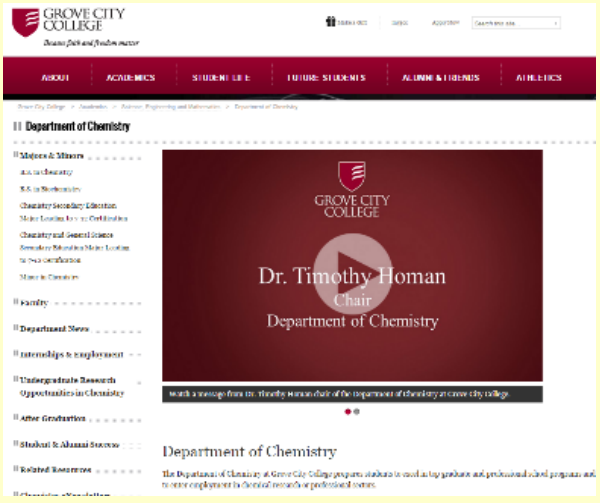
From Dr. Tim Homan, Chair

This year is bringing more changes to the Chemistry department. We welcome a new member to our faculty, Dr. Venney Wong, who will be profiled later in the newsletter. We are excited to have added her expertise in analytical chemistry to the department.

We will be saying farewell to Dr. Harold Conder at the end of this year. After 42 years of service to the GCC Chemistry department, he will be retiring. We will have a profile on him and his contributions to the department in the Spring edition of the eNewsletter.

The department added a new instrument, an electron spin resonance spectrometer, which you can read about in this issue of the eNewsletter.

The Chemistry Department, as well as the entire college, is working to adapt to the culture of 17-year olds as we seek to attract the next generation of students. Social media is so important to them, as well as gathering information online. One step we have taken to improve how the department may appear to prospective students is to add a video welcome message to our department web page. I recorded the message this summer, and you can see it by clicking "here" under the picture of our web page below.



Click here to see my welcome message.

Another step we have taken is to create a page for the Chemistry Department on Facebook. If you belong to Facebook, you can find our page by searching for "Grove City College Department of Chemistry" or simply clicking GCC FB. Dr. Shaw set up the page and is keeping it current with information about current events in the department, along with pictures of happenings to our students. We hope that this will be attractive to students looking to major in chemistry or biochemistry. Please "Like" the page when you visit, so that it will have a vibrancy that matches our program.

A step the college has taken to help attract more of the most talented students is a change to the trustee scholarship program. Starting this year, eight Trustee Fellows will be chosen to receive a scholarship which covers all of tuition, room, and board. Sixteen more Trustee Scholars will be chosen to receive an $8,000 scholarship. Beyond the monetary award, all 24 of these award recipients will be involved in a mentorship program, as well as taking part in special cultural activities available in Pittsburgh and the surrounding area. You can read more about the program on the college web site, www.gcc.edu, or just click TrusteeScholarship.

We trust that these steps will help to ensure that we continue to attract high-quality students, which will allow our department to continue to flourish in the years to come.

Faculty Update

Venney Wong, Ph.D.

Dr. Venney Wong is the newest member of the faculty of the Grove City College Chemistry Department. Originally from Malaysia, she has lived in Carbondale, Illinois, for 15 years while she was completing her undergraduate and graduate studies at Southern Illinois University Carbondale (SIUC). Her first exposure to the American education system occurred when she was in junior high school while her father completed a degree in music at SIUC. She completed her high school in Malaysia but came back to the States for her undergraduate, graduate and post-doctoral studies at SIUC.

She started doing research the second week of her undergraduate studies at SIUC. Her beloved organic professor, Dr. Daniel Dyer, took her in and mentored her for three years even though she did not know anything about working in a chemistry lab. It was here that she learned to synthesize polymer brushes from self-assembled monolayers on gold plates.

Three years into this project, she decided to remain at SIUC to continue research and pursue her doctorate. Her graduate advisor, Dr. Gary Kinsel, collaborated with Dr. Dyer and birthed a new project that became her dissertation. This project proudly earned them a patent. Sadly, the patent was not issued before Dr. Dyer passed away from cancer, so that he did not get to enjoy the honor he richly deserved for role in developing it. With the polymer brushes (also known as nanosponges), she utilized their unique properties to fractionate peptides and analyze them with Matrix Assisted Laser Desorption Ionization (MALDI) Mass Spectrometry.

Her other interest in chemistry is the area of Forensics. She interned at the Illinois State Police Crime Lab for a semester, shadowing a drug chemistry forensic scientist during her undergraduate studies. Little did she know that later she would be teaching a forensic course at SIUC.

Currently, Dr. Wong is relishing the work it takes to prepare for the Analytical Chemistry and Instrumental Analysis classes she is taking over. She is teaching Analytical Chemistry (CHEM 227) this Fall, along with the labs for SCIC 203 (the chemistry course for non-science majors). In the Spring, she will be teaching Instrumental analysis (CHEM 406).

Student Summer Research

Many of our students had great opportunities to work in industry or carry out research in academia in the summer of 2015.

Jocelyn Seaton working at Hoffman-LaRoche in Switzerland.

Jocelyn Seaton (BIOC, ’16) worked for Hoffman-LaRoche in Switzerland, searching for oligonucleotides to prevent cancer proliferation.

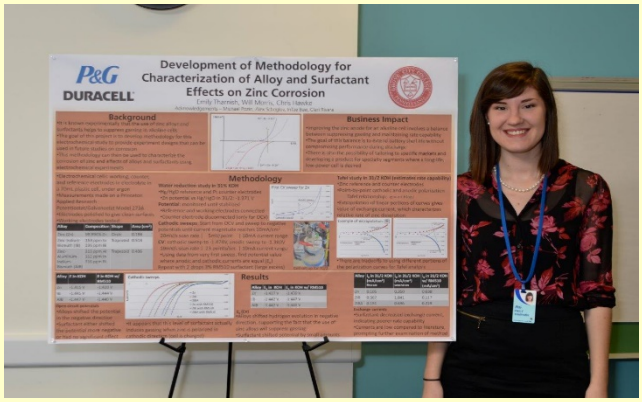
Rachel Zdaniewicz (BIOC, ’16) had a position as an operating room intern, assisting surgeons in the operating room.

Tim Bergquist (BIOC, ’16) worked at the University of Washington using bioinformatics to predict which mutant variants would be most likely to cause serious threats to health.

Alex Abel (CHEM, ’16) had an internship at the Lubrizol Corporation synthesizing new chelating agents.

Lauren Whitmire (CHEM, ’16) worked at Reaxis, Inc., synthesizing, testing, and optimizing new polymer catalysts.

Lauren Hake (CHEM, ’16) worked for Armstrong World Industries developing quality control methods and preparing a 67-page manual to use in GCMS analysis.



Emily Tharnish presents her work at Duracell.

Clare Clifton (BIOC, ’18) was selected for a highly competitive internship with the Lupus Center for Excellence (Allegheny Health Network) developing flow cytometry methods to identify diagnostic lupus biomarkers.

Matt Genzink (CHEM, ’18) worked on a research project at Calvin College where he developed better empirical nuclear screening constants for use in molecular modeling.

Rebecca McLaughlin (BIOC, ’17) had an REU position at Duquesne University, using experimental and computational tools to predict peptide fragmentation pattern.

Becca Caswell (CHEM, ’17) worked for Waters Corporation optimizing sample preparation protocols.

Nathan Rutter (BIOC, ’17) had a Research Experience for Undergraduates (REU) position at Duquesne University creating a protein-protein interaction model for drug design.

Emily Tharnish (CHEM, 17) had an internship at Duracell studying zinc corrosion with cyclic voltammetry to determine corrosion potentials and exchange currents.

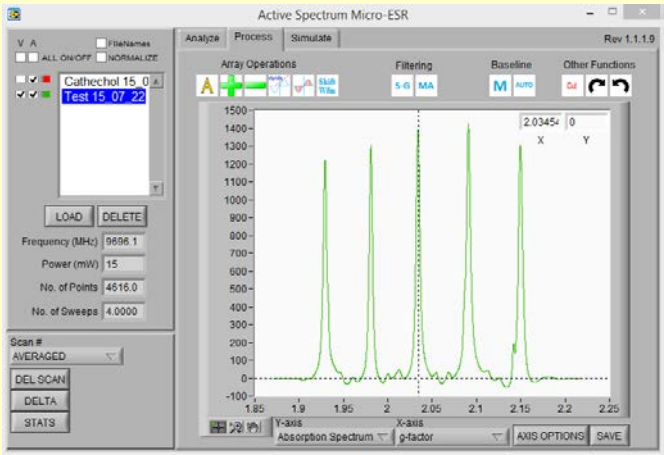
Clare Clifton (3rd from the left in the top row) is pictured with the other interns and mentors from the Allegheny health Network Lupus Center of Excellence summer research program.

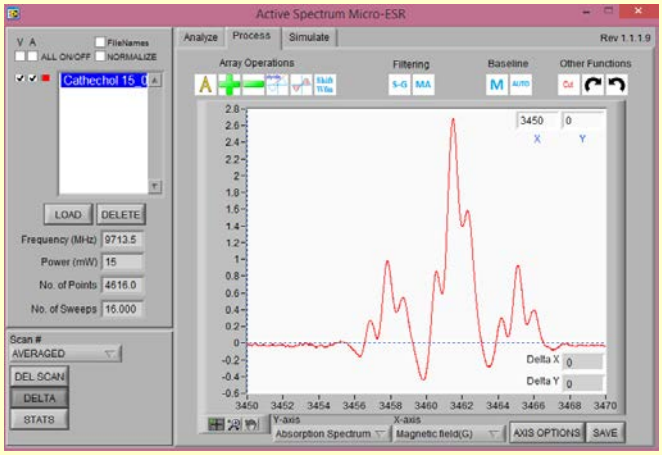
Chemistry adds Electron Spin Resonance Spectrometer

This year we were able to add an electron spin resonance (ESR) spectrometer to our department's resources. We purchased a benchtop Micro-ESR from Active Spectrum, which the manufacturer advertises as "the world's smallest and least expensive ESR spectrometer." It has a Windows PC built-in to the instrument.

In the picture to the right, a standard sample provided by the manufacturer is being analyzed, and what is seen on screen is the characteristic signal in ESR, the derivative of the absorption spectrum. The manufacturer provides very user friendly software to process the data. To the right, the software has been used to integrate the derivative spectrum to generate the more typical absorption spectrum.

Dr. Augspurger has replaced an experiment in the PChem lab which used a very simplified ESR apparatus with the new Micro-ESR. The students synthesize anions from dihydro-quinone, methyl-dihydroquinone, t-butyl-dihydroquinone, and catechol, and use the resulting spectra to deduce information about the electronic structure. Shown below is an example spectrum of the catechol anion, and the "triplet of triplet" structure seen below proves that there must be two sets of two equivalent protons. That can only be true if the anion is characterized by resonance.





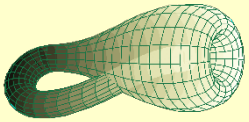
This instrument will also prove valuable to Dr. Kriley's research where new transition metal compounds are synthesized. It can be similarly useful in determining the electronic structure of the electrons on the transition metal. He also plans to incorporate it into the Inorganic Laboratory course in the future.

Generous Alumni Donations to the Chemistry Department

As we've moved into the beautiful new STEM Hall, we have been looking to add some memorabilia to enrich its environment. We have been aided in this process by some generous gifts from alumni and former faculty.

Jerry Carlson (CHEM, '54) donated three reproductions of paintings by Charles Meer Webb from the originals in the Fisher Collection of Alchemical and Historical Pictures in Pittsburgh. Dr. Kriley had them framed and one of them is pictured with Jerry on the right. It is hung on the second floor, directly across from the General Chemistry lab. The second is next to it, further down the hall, and the third in hung in the basement outside the research lab.

We have already filled a display case with several old laboratory items that were found in Rockwell. Jerry and his wife Lucille (Valli) Carlson brought us another gift this fall, a Klein Bottle. A Klein bottle is physical representation of a three-dimensional surface with only one side, similar to how a Mobius strip has only one side. Lucille gave this to Jerry as a gift in the early sixties. It sits in the picture to the left on the bottom shelf between Jerry and Lucille, and I've shown a sketch of one below.



Several items on the shelf had already been donated by Dr. and Mrs. Naegele. Mrs. Naegele recently donated a few more items, which are pictured at right: a copper beaker, two copper pitchers, and a copper steam bath. We are so grateful for these generous donations that allow us to preserve some of the rich history of chemistry.