

The

# MOLECULAR SIEVE

An annual newsletter for alumni and friends of the Andrews University Department of Chemistry and Biochemistry

An American Chemical Society Approved Program since 1976

Fall 2011

## Halenz Hall and Stockroom Renovation

### In This Issue:

- 1 Renovation
- 2 Renovation  
AU Chem Services
- 3 Research Core
- 4 Lisa Ahlberg ('91)  
Joins Department  
Scholarly Activities
- 5 Future Plans  
Forensics Lab
- 6 Graduates  
Donors
- 7 Chem Sem  
Chem Club News
- 8 Alumni News
- 9 Alumni Funding  
Instrumentation
- 10 Chair  
Alumni Parade

### Faculty:

Lisa Ahlberg, PhD  
Ryan Hayes, PhD  
Getahun Merga, PhD  
Desmond Murray, PhD  
David Nowack, PhD  
David Randall, PhD

### Staff:

Dana Johnston, MS  
John Rorabeck, MS  
Nancy Shepler

As you have probably heard, 2011 has been a time of substantial and truly exciting physical improvement to the Andrews campus. The opening of Buller Hall coupled with the renovation of Nethery Hall enhances the learning environment for our students, the completion of a second women's dorm provides more housing, and the re-establishment of a Griggs Hall in the Lake Union buildings integrates Griggs University and International Academy with Andrews University.

We feel blessed to report that Halenz Hall, named for an influential chemistry professor at Emmanuel Missionary College, and the home of the chemistry department since 1974, also saw a major improvement to the physical plant.

In 2010, the university committed to a multi-year project to upgrade the building's heating, ventilation, and air conditioning (HVAC) system. This represents a substantial commitment by the university to Christian SDA science education, for which we are grateful. The ultimate goal of the project is to improve the air quality in the building and to more than double the hood space in the organic chemistry teaching laboratories. The planned additional hood space reflects modern organic chemistry lab teaching practices where most reactions are conducted in fume hoods for health and safety reasons. The renovated HVAC system is anticipated to reduce heating costs for the

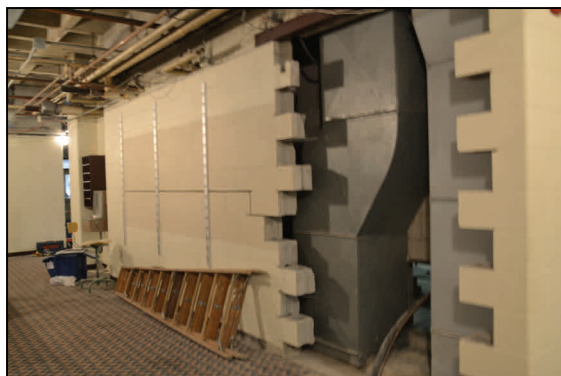


Ceilings were removed to allow all ductwork to be upgraded. New wiring for an alarm system was also installed.

university as well by employing "smart" computerized HVAC valves.

During the summer of 2011, the ductwork on the second and third floors was replaced. It was necessary for the department to vacate this area while the work was done. At the literal and figurative heart of the chemistry building are the second and third floor stockrooms which we spent the first few weeks of the summer completely emptying. Our friends in biology graciously agreed to host the office for the summer. Though renovating the stockrooms was not part of the original project, Dr. David Nowack, chair of the

*(Continued on page 2)*



Several walls were opened to allow access to ventilation chases.



Dr. Nowack looks on as the crew installs our high-volume air handling system in the 3rd floor stockroom.

## Stockroom Renovation

## AU Chem Services



Margarita Mattingly, chair of the Department of Physics, and her physics colleague, Brendan Cross, admire the new stockroom with Keith Mattingly, dean of the College of Arts and Sciences.

Andrews University Chemistry Services (AUCS) began operating in March of this year in response to an industrial customer's need to have our department handle storage and shipping of some proprietary chemical products. These are dendrimers that Ryan Hayes helped to develop while he was employed in industry before joining the faculty here in the Department of Chemistry and Biochemistry.

The motivation behind AUCS is to provide chemistry-based services to customers while also providing valuable experiences for our students and faculty. We see this as part of an outreach activity that helps others know about Seventh-day Adventists, Andrews University, and our unique chemistry department. The concept is that AUCS can develop into an operating unit of the chemistry department in the way that Physics Enterprises is a part of the physics department.

One of reasons we have been able to start AUCS is due to the personnel and experience of the chemistry department faculty and staff. Hayes and David Randall bring many years of industrial and business experience, and Dana Johnston possesses a unique skill set integrating business and chemistry—these human resources have allowed this opportunity to take root. Johnston has already used her excellent administrative abilities to organize and improve many functions with our industrial partner as we serve as a storage and shipping center for some advanced nanomaterials. Hayes's intimate knowledge of the chemicals has allowed him to go beyond the shipping and storing functions to actually synthesize popular dendrimers whose stock needed to be replenished.

We are currently exploring other molecules that we could possibly add as products to sell. Desmond Murray's expertise with organic synthesis points us in one promising direction. Please pray for this fledgling project as we continue to look for more ways to expand and create more business opportunities that will help educate and train our students while providing employment opportunities for them as well.

department, realized that this was an opportunity to install new shelving, counters, and cabinetry. In July, the plan for the project came together and he worked urgently with the departmental alumni and friends, university administration, and Physics Enterprises to obtain the \$75,000 needed for the project. We are grateful for the timely support of so many of our alumni and friends.

On the first Friday afternoon of the school year, students, from freshmen to seniors, worked side-by-side with faculty and professors emeriti to move back into the stockroom: putting shelving units in place; fastening them together; restocking the shelves with chemicals and glassware. The work crew then met for a simple haystack supper across from the science complex at the maple grove.

Dr. Nowack comments, "I am grateful for the 'can-do' spirit of the faculty and staff. The move-out and move-in involved a lot of work and detail. Everyone pitched-in."

~ David Randall

~ Ryan Hayes



Satoshi Thiele and Jonathan Lee begin putting the chemicals on the beautiful new shelving units.



Erica Evans and Ryan Hayes working on a project for Andrews University Chemistry Services using the new fluorescence spectrometer.



# Andrews Chemistry & Biochemistry Research at the Core

Fundamentally, chemistry is an experimental science. Teaching chemistry at any level from grade school to graduate school necessarily involves engaging students in hands-on laboratory experiences. Chemistry is best learned by doing.

With this in mind, our department has steadily increased its research capabilities and productivity through acquisition of new instruments, increased faculty output, increased involvement of students in research during the school year and in summer research opportunities. For example, since our last issue of *Molecular Sieve*, the department has acquired a new Cary Eclipse Fluorescence instrument and a new Agilent 1260 HPLC.

In terms of faculty research, a higher percentage of faculty are now actively involved in research both during the school year and during the summer. Faculty research areas span from biochemistry (*Nowack*) to nanochemistry (*Merga*), and from computational chemistry (*Randall*) to synthesis (*Murray*, *Ahlberg*) and spectroscopy (*Hayes*, *Randall*). More detailed description of faculty research interests can be viewed at <http://www.andrews.edu/cas/chemistry/research/>

Currently, *Luis Garibay*, a junior chemistry and mathematics double major, is working on two projects with Dr. Randall. One project involves looking for greener alternatives to potassium dichromate as a standard reference material for high precision redox titrations. They have discovered that potassium iodate is an excellent alternative and plans are to incorporate it into the 'famed' quantitative analysis course. The second project investigates the ability of computational chemistry (at the density functional level) to predict the  $pK_a$ 's of compounds. Lidocaine, a common dental anesthetic, is the molecule currently under investigation. These projects, like many others in the department, are supported by the Andrews University Undergraduate Research Scholarships.

*Luis* also had the opportunity to participate in an NSF-funded Research Experience for Undergraduates (REU) program at Northwestern University where he used tip-enhanced Raman spectroscopy in an attempt to detect the Raman spectrum of a single molecule of Rhodamine 6G.

Sophomore *Camille Martin*, current Chemistry Club secretary, began her research experiences last year as a freshman with Dr. Murray followed by an REU summer experience at Virginia Commonwealth University (VCU) in Richmond, Virginia. Her project at VCU involved synthesis of ethylenediamine gradients on TLC plates for metal ion separation. *Camille* is currently working on development of fluorescent pyruvates as molecular sensors for hydrogen peroxide. This project consist of two phases, synthesis and spectroscopy, and is jointly supervised by Drs. Hayes and Murray. In addition, two Andrews Academy seniors, *Alyson Drew* and *Obed Galla*, are also conducting organic synthetic methodology research on this project. In fact, the pyruvate project began as a Grade 12 independent research project (IRP) and was further developed over the 2011 summer under Dr. Murray's supervision by *Alyssa Schuettpelz*

(<http://www.bestearly.com/labtales-2011-number-1-new-ginger-based-odors>).

Biology junior (and chemistry minor) *Erica Evans*, biochemistry senior *Brittany Foster*, and engineering freshman *James Magbanua* are also part of an interdisciplinary team along with Hayes (absorption and emission spectroscopy), Murray (synthesis), and engineering professor Hyun Kwon (electrochemistry). The project involves the development of stilbene based sensors for copper and other biologically important heavy metal ions. In addition, part of this research team is Western Michigan University chemistry professor Sherine Obare (spectroelectrochemistry).

Other students currently involved in research in the department include: *Mubanga Chisulo* (Synthesis of Biaryl



Christina Hong setting up a reaction in the fume hood.

Stilbenes); medical laboratory sciences sophomore *Lora Filipova* (Synthesis of Mixed Acylals *via* Mixed Anhydrides); biology senior *Steffie-Ann Dujon* (Synthesis and Biological Activity of Fatty Acids Chloroacylals as Potential Bipolar Disorder Prodrugs); biology sophomore *Davina Johnson* (Aminopyrimidine Stilbenes as Sensors for Nucleic Acids); business administration senior *James C Lynch* (Analysis of Heterocyclic Amines in Soy Products); and biology senior *Brittany Wojcik* (Development of Stilbene Synthesis Methodology), who is continuing work done this summer by *Taylor Glick*, now a biomedical engineering freshman at the University of Michigan.

Finally, *Adam Shull*, a senior chemistry and engineering double major worked as a summer (2011) intern in the Amway Research and Development Facility in Ada, Michigan. His work involved the study of novel methods of non-destructively analyzing compressed carbon block filters to determine their integrity.

~ Desmond Murray

# Lisa Ahlberg ('91) Joins the Department

It is our great fortune to have Dr. Lisa Ahlberg join our faculty. Her primary teaching responsibilities will be Organic Chemistry and Instrumental Analysis. As the other trained organic chemist in the department it is a delight to have Lisa on board and it has been a pleasure working with her, sharing ideas on instruction, planning lab experiments, and co-teaching our Organic Chemistry lab course.

Dr. Lisa Ahlberg graduated from Andrews University with a BS in biochemistry. She earned a PhD for research in organic chemistry from the University of California, Davis, in 1997. She was co-author on one of the first papers developing combinatorial chemistry: a method to rapidly synthesize multiple compounds of potential biological activity.

The title of her dissertation is *Polymer-supported Combinatorial Chemistry: Small Organic Library Synthesis and Detection*. While in graduate school she was involved in a program designed to encourage middle school and high school girls in science. After completing her work at Davis, she did post-doctoral cancer research at University of California, San Francisco (UCSF) investigating the interaction between DNA, carcinogens, and metal ions.

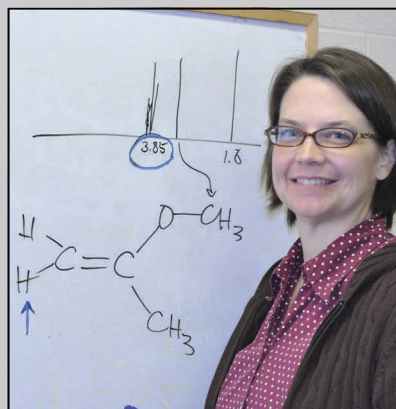
After finishing at UCSF, she moved to an industrial research setting at SRI International (formerly Stanford Research Institute), in Menlo Park, CA, where she used her organic chemistry and cancer knowledge to help produce compounds in support of a contract funded by the National Cancer Institute. At SRI, she also supervised members of a cross-disciplinary team developing lateral flow assays to rapidly detect various potential biological chemical warfare agents. She has also worked at a small biotech company, Hermes Biosciences, in South San Francisco, developing cancer treatment drugs. Her research has been published in the *Journal of the American Chemical Society*, *Journal of Organic Chemistry*, and *Tetrahedron*.

Prior to her full-time appointment here at Andrews, Lisa has enjoyed teaching several different chemistry classes and labs, both in California and in the Michiana region.

Lisa's primary research interest is in small molecule synthesis directed toward compounds of possible biological importance. Molecules that could function as antibiotics, anti-malarials, or anti-tuberculosis compounds are of interest for their biological impact as well as the synthetic methodology development needed to create them.

Lisa is married to David Randall and they have two children. She and David enjoy cooking together producing, among other things, batches of homemade yogurt.

Welcome!



~ Desmond Murray

## Scholarly Activities

**GETAHUN MERGA**—presented a poster, in May, titled “Synthesis and Characterization of ‘Naked’ Gold Nanoparticles” at the 4th International Conference on Metrology: Measurement and Testing in the Service of Society, which was held in Jerusalem, Israel.

**DESMOND MURRAY AND DAVID RANDALL**—collaborated on the paper: “Integrating Webinar and Blogging Technologies into Chemistry Seminar,” Dan Hamstra, Jyllian N. Kemsley, Desmond H. Murray, David W. Randall, *J. Chem Educ.*, 2011, 88 (8), pp 1085–1089.

**DAVID RANDALL**—in February, presented a paper (see above) to the Michigan Academy of Science, Arts, and Letters; Grand Valley State University, Bay City, MI.

**DAVID RANDALL**—in April, presented a paper (see above) at the 12th Scholarship of Teaching and Learning Conference; Indiana University, South Bend, IN.

**DAVID RANDALL**—junior student Luis Garibay, presented: “Looking for an Alternative to Potassium Dichromate in Quantitative Chemistry Experiments” at the Michigan Academy of Science, Arts, and Letters, Saginaw Valley State University, Bay City, MI, March 2011. Co-authors: L. K. Garibay, D. W. Randall

**RYAN HAYES**—continues to research methods to characterize highly branched polymers (dendrimers) using NIR absorption spectroscopy for quality control and reactivity. Funding for this research has been from the Andrews University Undergraduate Research Scholarship (URS) which pays for the student labor.

**DESMOND MURRAY AND RYAN HAYES**—are studying the optical properties of stilbenes using our new fluorescence spectrophotometer. Dr. Murray's research group produces many types of stilbenes which are candidates for structure-activity relationships. Some of the stilbenes are showing interesting metal ion sensing behavior. The research is funded by both a URS and an Andrews University Faculty Grant (AUGF).

**RYAN HAYES**—and students are using our new Agilent 1260 HPLC to separate and isolate potentially carcinogenic compounds in overcooked soy-based food products. There are some indications that toxic heterocyclic amine compounds form under high temperatures. Carcinogenic heterocyclic amine formation occurs in grilled meats and arises as creatine reacts with other amino acids at the high temperatures of frying.

**DAVID RANDALL**—attended the JEOL NMR user training class, Peabody, MA, in July, 2011.

**DAVID NOWACK**—is collaborating with Dr. Brian Haab of the Van Andel Research Institute of Grand Rapids, MI, in the investigation into the use of the bird flu influenza protein haemagglutinin (HA) to identify modified sialic acid groups linked to cancer progression.

# Planning for Future Renovations

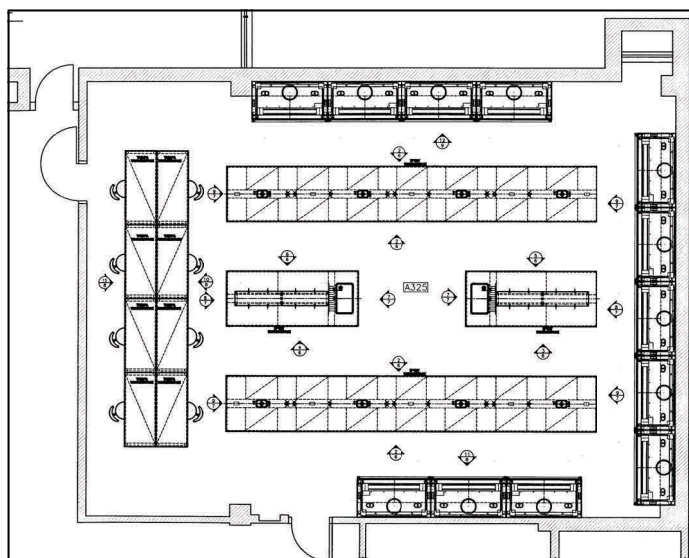
The enormous effort that culminated in the renovation of the stockroom paid off with a truly modern and safer workplace. Yet, the Halenz Hall facilities upgrade is far from over.

The planning is moving forward for the next two summers to complete the necessary work. During the summer of 2012, the 3<sup>rd</sup> floor organic teaching laboratories will be renovated. The following year, in the summer of 2013, we will realize the 1<sup>st</sup> floor renovation which will include the amphitheater upgrade and the last, vital air-handling ductwork installation.

The organic teaching laboratory renovation will be extensive. The two rooms will be gutted to the walls. A minimum of 12 new hoods will be installed in each of the rooms to allow for all reactions to be carried out in a hood—much improving the air quality and safety for students and teachers alike. The carpet—which has trapped spills for years—will be removed and an epoxy-type flooring will replace it to allow for a healthier environment and easier cleaning. A new counter top arrangement will be installed that will allow for convenient utilization of instrumentation right in the laboratory. New group-learning table tops and large tables will be installed in the same location for projection equipment to enhance teaching.

The combination of new flooring, new hoods, and reconfigured counter tops will transform the rooms into a safe, productive teaching and learning environment. Because each of the teaching labs will have instrumentation in-room, students will no longer be compelled to transport samples to instrument rooms down the hall.

The summer of 2013 will mark the final phase of the Halenz Hall air-handling and room renovation. The ductwork for the first floor is embedded in the ceiling of the chemistry amphitheater. The entire ceiling will have to be removed to get access to that ductwork. Thus, this will be a good time to upgrade everything in the amphitheater. We urgently need new lighting, audio and visual projection, new



Proposed floor plan for the renovated organic teaching labs.

blackboards, and new carpet for the amphitheater. If there is enough money, the seating may also get new upholstery. To improve air quality, additional ductwork around the perimeter of the first floor will finish the project.

At that time, the workers will remove all of the floor-mounted air-handling units that are now in place. Their outside air intakes have been sealed for years and the removal of the entire unit in each room will increase the flexibility and floor space for both labs and classrooms. Their heating and cooling features will no longer be necessary when the new system is on line.

Change of this magnitude is hard work and costly. But the changes represent the necessary steps to bring the department up to accepted standards of health and safety. The Andrews University administration has committed significant resources to make Halenz Hall a healthy place to work and learn. The faculty have stepped up to do their part as their expertise requires. We are so grateful to God, who has blessed us with such generous friends and alumni. Please stop by anytime to see the changes in your chemistry department. I know that you will be pleased with the changes you see.

~ David Nowack

## Forensics Laboratory

Berrien County Prosecutors have a new class of drugs to be concerned with and have been looking to Andrews University for technical support. A series of naphthoyl-indoles and naphthoylpyrroles (the so-called JWH compounds after the researcher who developed them while investigating cannabinoid receptor response) have found their way into incense preparations with such names as *Spice*, *K-2*, *Spike*, and others. The Drug Enforcement Agency and each of the fifty states banned these substances in October 2010 due to their potent effect on brain cannabinoid receptors resulting in rapid onset of illness.

Berrien County Forensic Laboratory analyst, John Rorabeck, first encountered these submitted specimens in the summer of 2010 while they were still sold legally. Along with reporting the presence of these synthetic cannabinoids in street samples, he was able to testify in court that they were not responsible for positive cannabinoid urinalysis results due to structural differences with natural THC metabolites.

Advanced analytical instruments such as the TOF-GC/MS and a depth of experience in forensic case work has positioned the Andrews University Department of Chemistry and Biochemistry to provide valuable law enforcement service to the citizens of Southwestern Michigan.

~ John Rorabeck





# Spring 2011 Graduates and Awards

## Spring 2011 Undergraduate Degrees Awarded

Celena Cameron, BS Biochemistry  
Gi Hyun Choi, BS Biochemistry  
Shieun Sharon Jang, BS Biochemistry  
Seonui Kang, BS Biochemistry  
Chantelle Tanya Krym, BS Biochemistry  
Andrew James Master\*, BS Chemistry  
Katie Lynne Parker\*, BS Chemistry  
Andrew Young Min Yang, BS Biochemistry

\*completed requirements for ACS certificate

## Spring 2011 Awards

ACS General Chemistry Award.....Lynda Lee  
ACS Analytical Chemistry Award .....Adam Shull  
ACS Organic Chemistry Award.....William Tritch

## Spring 2011 Scholarships

Richard Cook Scholarship..... Jason Garrett  
Dwain Ford Scholarship ..... Courtney Tait  
Halenz Scholarship ..... William Tritch  
Richard Minesinger Scholarship ..... Mark Bateman  
Lois K. Mutch Scholarship..... Adam Shull  
Mutch, Scorpio, Wilkins Scholarship ..... Stephen Gilbert  
R. Scorpio Scholarship.....Jonathan Lee  
Tait Family Scholarship.....Lynda Lee  
Wilkins Scholarship ..... Luis Garibay  
Chai Hee Wong Scholarship ..... Tamara Mackey  
Theodore Hirsch Scholarship..... Soon Ho Park

### Thank You to the Generous Chemistry Partners of 2011

#### Alkali Metals ≤ \$99

Duane & Ruth Lemon, Earl & Betty Peters,  
Ursula Whiting, Darrel & Anna Opicka, Donald Caster,  
Dale & Janice Latonn

#### Halogens \$100—\$199

Anne & Richard Afton, Ronald Bishop, Kenneth Fletcher,  
Paul & Kathleen Freeman, Waylene & Ron Swensen,  
Ervin & Jani Domzal, Joann Kosinski,

#### Transition Metals \$200—\$499

David & Jean Dassenko, Leroy & Jennifer Ward,  
Grace Carlos, Loren & Dawn Mann, Lyndel & Patricia  
Dickerson, Raymond Mayor, Janet Thomas,

#### Metalloids \$500—\$999

Victor & Marianne Lidner, Clifford & Bonnie Vance

#### Noble Gases \$1,000—\$4,999

Tom & Sally DeWind, Clifford & Marilyn Herrmann,  
Donn & Esther LaTour, Jeanine McNeill, Bill & Pat Mutch,  
Wayne & Dawna Friestad

#### Rare Earth Elements \$5,000—\$9,999

David Moll, Paul & Sarah Herrmann, Jane & Jerry Thayer,  
Bradley & Jill Tait

#### Mendeleev Circle ≥ \$10,000

# Chem Alumni CONTACT

Please update information about yourself. We look forward to hearing from you.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone \_\_\_\_\_ E-Mail Address \_\_\_\_\_

Occupation \_\_\_\_\_

Employer/Firm \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

## Degrees Received:

At Andrews \_\_\_\_\_  
Degree \_\_\_\_\_ Year \_\_\_\_\_

Other: \_\_\_\_\_  
Degree \_\_\_\_\_ Year \_\_\_\_\_

## News about yourself & your family:

E-mail notes to [chemistry@andrews.edu](mailto:chemistry@andrews.edu).

We would love to receive **pictures** too.

## Becoming a Chemistry Partner:

Yes, I would like to help the Department of Chemistry and Biochemistry achieve its goals by making a contribution.

**Please use my gift of \$\_\_\_\_\_ for:**

- General contribution in area of greatest need
- Chemistry Alumni Undergraduate Scholarship
- Named scholarships
- Undergraduate research support

**YOUR NAME** (as you wish it to appear in the next issue of "The Molecular Sieve", or "Anonymous" if you don't want your name used in connection with this gift.)

Will your employer match funds?

- Yes (if so, please include with this form the matching gift form from your personnel office.)
- No
- Don't know

Credit card information: \_\_\_\_\_

Exp \_\_\_\_\_

Or send to: Department of Chemistry and Biochemistry  
4270 Administrative Drive, HH225  
Andrews University  
Berrien Springs, MI 49104

## Chem Sem Building on Tradition

Started forty-six years ago under the leadership of Dwain Ford, then department chair, our chemistry seminar course, known as Chem Sem, has undergone several curricular changes and innovations. The tradition of featuring guest speakers had its beginning in the 1971-1972 school year.

Our current Chem Sem program rivals any offered at the undergraduate level across the country. We are proud to highlight the importance of communication in science and communication by scientists to both specialized and general audiences. In the last few years we have incorporated social media, webinar, and live-streaming technologies. These innovations have continued to put our department on the cutting edge of undergraduate seminar programming. Starting in the fall of 2009, blogging was introduced as a course requirement for both juniors and seniors. This allows students to use written communication skills to reflect upon the content and style of the presentations. ChemSemBlog can be viewed at <http://www.bestearly.com/chemsemblog>.

Also in fall 2009, we began broadening the potential pool of guest speakers available to our students by incorporating a webinar format. In this format, speakers do not have to be physically here with us, but can deliver their seminar talk from hundreds or thousands of miles away without leaving their offices or homes. Our first webinar was given by Dr. Jyllian Kemsley, associate editor of Chemical & Engineering News (C&EN), from her residence in California. A full description of the blogging and webinar innovations is given in our recently published paper in the *Journal of Chemical Education*. This semester we have had four webinars as part of our lecture series showcasing eleven invited guests. The speakers for these webinars are based in Des Moines, IA; Bellefonte, PA; Lincoln, NE; and Cambridge, MA.

This fall 2011, we have embarked on live-streaming of all our departmental guest presentations. This exciting development allows us to broaden the audience for our seminars from students and faculty gathered in the Chemistry Amphitheater to anyone anywhere online. The potential impact and value of expanding the reach of our seminars beyond the walls of our on-campus classrooms and into offices, homes, and classrooms with internet access is enormous. We anticipate that this 'live-streaming' experiment will provide a powerful tool for outreach, recruiting, and marketing of our department.

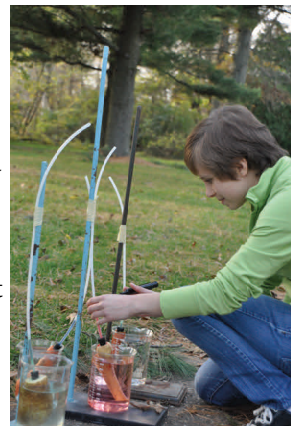
We would strongly encourage all of you chemistry and biochemistry alumni to support this effort in any way that you can. Specifically, you can help by: tuning in and connecting each week to the live streaming lectures; encouraging others—associates, high school chemistry classes, other undergrad chemistry programs, etc.—to view the online lectures; giving a webinar presentation and/or encouraging other professionals to do so; and helping to defray the operating costs for this service.

~ Desmond Murray

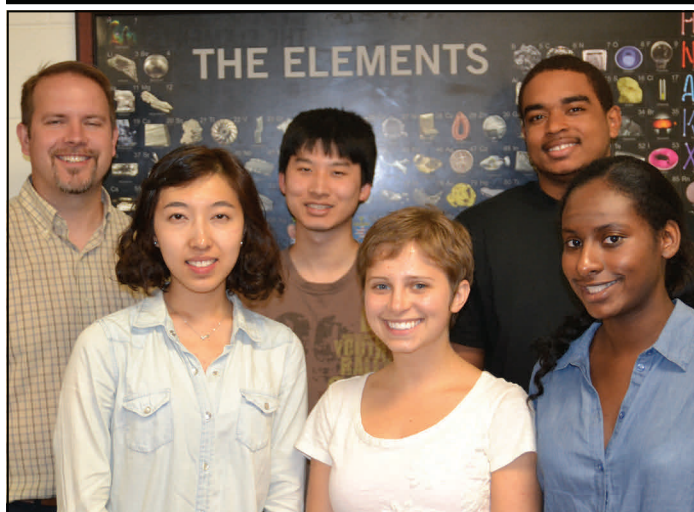
## 6:02 on 10-23 Mole Day!

Food, friends, and friendly competition brought out the revelrous celebrants of Mole Day, October 23, 2011. This year's event was held on a mild Sunday evening that brought a small crowd to enjoy a bonfire at Beaver point and another haystack meal complete with guacaMOLE, leMOLEnade, and MOLEasses cookies. The event included carrot, potato, and parsnip osmotic pressure races where Dave Nowack's entry had the distinction of going backwards but Ryan Hayes' carrot pushed water uphill nearly three inches over the hour-long "race." These "osmotic towers" use vegetables as osmotic membranes. Holes are drilled out of each tuber, then filled with corn syrup, and then plugged with a one holed-stopper connected to vertical tubing. At 6:02 p.m. we saluted Sig. Avogadro and his famous number. The evening festivities continued with the reading of the Chemistry Week questions and answers. The meal was capped off by ripping into the beautiful periodic table of cupcakes. Ninety-six cupcakes, frosted with chemical symbols and sprinkled with colored sugar to denote the various groups—halogens, metals, noble gases, etc.—had been assembled by the Chem Club in the second annual baking session at the Randall's house the evening before. Because cupcakes can't move, this was a more organized periodic table than the Human Periodic Table of the Elements from the Alumni Parade.

~ Ryan Hayes



## Chem Club 2011-2012



L-R: Ryan Hayes, sponsor; Samuel Kang, public relations; Kenneth Richardson, president; Christine Shin, treasurer; Courtney Tait, vice-president; Camille Martin, Secretary

# Alumni News

## **Celena Cameron (BS, Biochem. '11)**

My memories include the many activities we did in ChemClub and interacting with teachers and colleagues. Performing experiments during the ice cream social and making a periodic table out of cupcakes were also fun. I am currently living in Worcester, MA, pursuing a doctor of pharmacy degree from Massachusetts College of Pharmacy. I am enjoying the classes and there are plenty of exams to keep my mind sharp and to test my knowledge. My family is doing well and they continue to support me in my decisions throughout my academic career.

## **Kenneth Fletcher (BS, Chem. '10)**

I am currently a graduate student at the University of Michigan, Ann Arbor, MI. I will receive my master's degree in chemistry in December, 2011.

## **John Crouse (BS, Chem. '99)**

One of my vivid memories is of Dr. Wong in Physical Chemistry—"It's gonna get a whole lot worse before it gets any better!"

I now live in LaMirada, CA, where I work as a research staff scientist at Caltech conducting field and laboratory research in atmospheric chemistry.

My wife, Kimberly, and I have a wonderful 2-year-old named Leif.

## **Todd Tritch (BS, Chem. '84)**

I remember making explosive iodine powder that would pop and leave purple spots on the carpet when people stepped on it. I wondered if the purple stain was permanent—it was not.

I went on to medical school at the University of Maryland, my home state, and graduated in 1988. I finished a residency program in family practice in 1991. I will be able to accomplish my ultimate goal of being a missionary doctor when I am done helping my two sons finish college.

We currently live in Maine. I work as an emergency room physician in a small rural hospital. I have been married to the mother of my two sons for 23 years. Her name is Dawn (née Oddie). My youngest son, Neville, is a second year engineering student at Walla Walla. My oldest, you may know is William, and he is there at Andrews. This year he has switched his major from chemistry to physics.

## **Rick Afton (BS, Chem. '77)**

After graduating from Andrews, I pursued additional studies in coatings chemistry from the University of Missouri. I have worked for 34 years in the coatings chemistry field for Valspar Corporation. My current title is *Global Technical Director*, and I cover China, South America, Mexico, Australia, Finland, and the United States. I deal with research and development as well as with commercialization functions. I sit on numerous committees for the NCCA (National Coil Coating Association).

We live in Bowling Green, Kentucky, where I teach a weekly Sabbath School class discussing various books and topics on current events. I am a drummer in two progressive Christian bands, and we perform two to three times per weekend for several church services and a

Celebrate Recovery meeting.

My son and daughter-in-law, Scott Afton and Lisa Afton Fedusenko—both Andrews alumni, are doing well and have obtained their doctorates from the University of Cincinnati. They now live in Wake Forrest, NC. My daughter Danielle is going back to Southern University.

I still love to play golf when I can.

## **Duane Lemon (BA, Chem. '65)**

After graduating in 1965, I added a master's degree in education in 1974. I taught for the Seventh-day Adventist denomination for 41 years before retiring from Forest Lake Academy in Apopka, FL, in 2007. Presently, my wife and I live in Collegedale, TN. We have two grown children and six grandchildren.

Some of my memories are of the old wooden chemistry building with the manual balances. I remember long hours in labs and Dr. Ford's methods class. The education provided at Andrews shaped my teaching career. I am still involved in substitute teaching in the local area schools.

## **Norman Moll (BA, Chem. '63)**

I majored in chemistry and mathematics with a minor in physics. I received my PhD in physical chemistry from Case Institute (Case Western Reserve University) in 1966.

In 1995, I retired from a 30 year career at Dow Chemical. Since retirement, I have consulted a bit. I am also a member of the President's Council at Andrews University and enjoy maintaining contact with faculty and staff of Andrews.

My current interests and activities include: gardening, creation science, Bible study and Bible prophecy, playing the trumpet and teaching trumpet, pipe organs, and creating illustrated lectures.

## **Donald Halenz (BA, Chem. '57)**

I am sending an update representing the "Old Guard." From Andrews, I went to Virginia Polytechnic for the MS (1959) and PhD (1962) in biochemistry and nutrition. The next five years were happily spent at Andrews where Bill Mutch was a General Chemistry student of mine. My father was there with me for a year or so, and then Dwain Ford, Ivan Holmes, Bob Wilkins, and James VanHise.

Following my time at Andrews, we served overseas in the Philippines, Indonesia, and Singapore. I taught at Philippine Union College, was dean and president at Mountain View College, studied language in Indonesia, and served as president of Southeast Asia Union College.

We returned to the United States in 1979. After a one-year postdoctoral position at UC Davis, I served as professor of chemistry (chair for eight years) at Pacific Union College until 1999. I was then the associate academic dean until my final retirement in 2004.

Since 2004, we have been happily visiting our children and grandchildren and making several overseas trips—to the Amazon River, Africa, Russia, Vietnam, India, and Costa Rica. I am now accepting a volunteer position as Gospel Outreach Director for Southern India.

I much appreciate the good start I received at Andrews and feel that my wife and I have been richly blessed.



## Alumni News

### Everett Smith (BA, Chem. '49)

In 1953 I received my MD from Loma Linda University. I interned at Ohio State University Hospital from 1953 to 1954. Then from 1954 to 1995, I practiced family medicine in North Carolina.

After retirement, I lived in Arizona for ten years and in California for four years. Currently, I live in North Carolina.

## Generous Alumni Funding

The alumni and friends of the Andrews University Department of Chemistry and Biochemistry gave generously to support the renovation of the chemistry stockrooms. In less than three months, following a mailed appeal in May, 2011, a total of more than \$25,000 was donated. That support, combined with the commitment of a large portion of the chemistry department restricted fund, some additional funds from the university administration, and a special allocation from the dean of the College of Arts and Sciences, provided the needed final cost of \$75,000.

Those funds purchased high quality, corrosion resistant shelving from an established U.S. manufacturer. It also paid for new counter tops and cabinetry to replace the completely worn out wooden units that had been in place since the building was first occupied. The plant services administration funded the new flooring, paint, high-efficiency lighting, and plumbing changes.

All this, combined with the new air-handling management and ductwork, has made the stockrooms a bright, refreshing place in which to work.

The alumni support of their department is truly generous and inspiring. The faculty and students are enjoying the new environment and are committed to using these new resources to create an outstanding teaching, learning, and research environment.

~ David Nowack



Showing new flooring, new counter top, and new fume hood. In the foreground, the new shelving units are being assembled.

## New Instrumentation

The department recently acquired a fluorescence spectrometer from Agilent. The Cary Eclipse will collect a fluorescence emission or excitation spectrum from 200-900 nm in a few seconds and output the information to a



Our new Cary Eclipse Fluorescence Spectrometer

computer and replaces a Perkin-Elmer 204 which was manually controlled and required information to be recorded by hand or plotter. This new instrument allows our students to quickly and accurately characterize the emissive properties of novel materials being generated in our research

projects. It will also expand the type and quantity of experiments performed in our upper division classes while exposing our students to state-of-the-art optical analysis equipment. There is a sample compartment adapter to analyze fluorescence from solutions in 96-well plates which should allow use by the larger, lower division classes. This instrument is a nice match to our existing Cary 5000 UV-VIS-NIR spectrometer and these two instruments are the standard industrial tools for doing steady-state absorption and emission spectroscopy.

We also recently acquired an Agilent 1260 HPLC with photodiode array and refractive index detectors. It comes with a 100-position autosampler and a binary pump for gradient elution separations. This is another industry standard analytical tool and will serve to train our students on the current technology used in industrial and research communities. Many of the faculty will be putting this equipment to use for classroom and research projects. This instrument is operated by a Windows 7 computer which provides many automated control functions allowing the user to collect data while doing other important tasks—such as teaching—or even sleeping.

Our department is also looking to obtain a GC-mass spectrometer for small volatiles analysis, an Inductively Coupled Plasma spectrometer for trace metals analysis, multiple infrared spectrometers for functional group analysis, and a few others. These upgrades are critical to providing our students with best education using the latest tools.

We are thankful to Andrews University's capital equipment fund and to alumni and friends for the resources to obtain this vital new equipment.

~ Ryan Hayes



Our new Agilent 1260 HPLC



D. David Nowack, PhD

## Message from the Chair

As you have read and seen in this issue of the *Molecular Sieve*, it has been a momentous year for the Department of Chemistry and Biochemistry. The renovations and new instrumentation are

significantly strengthening our ability to fulfill our mission—which is to equip new chemists with the training and experience they need in order to contribute to society and to the church. Much has been accomplished, but we are not finished. The renovation of the department continues in the areas of physical plant improvement, acquisition of new instrumentation, and curriculum review.

The physical plant improvement will continue for the next two summers. The faculty are working with Andrews plant administration and vendors to plan for the complete gutting and refurbishing of the two organic chemistry teaching labs on the third floor of Halenz Hall. The plans call for new cabinetry, new layout, and increased numbers of fume hoods. This will provide enough fume hood space so that all organic reactions will be done with proper ventilation. The new layout will include space and utilities for analytical instrumentation such as FR-IR and GC in each of the rooms. Projection equipment and tables allowing for group teaching/learning will make the labs a comprehensive learning environment.

The Andrews administration is continuing to invest in the department's instrumentation needs. The next equipment acquisition is to be a GC/MS that is scheduled to be purchased in the next fiscal year. As in the recent purchases of the fluorescence spectrometer and the dual detector/dual pump HPLC, the GC/MS is a transformative instrument that will have an impact at all levels of the curriculum.

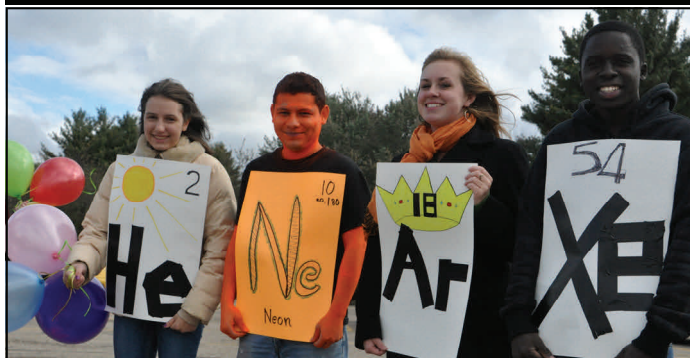
The curriculum of the department is evolving to meet the needs of current students by adding independent research opportunities early in the four-year program. Early research activity stimulates enthusiasm, integrates classroom learning with hands-on skills, enhances critical-thinking skills, and creates strong student-mentor bonding. We continue to adapt our educational offerings to meet the challenges of today's academic, industrial, and financial environment.

With the continuing partnership of the administration, alumni, friends, and faculty, the renovations will create a dynamic and stimulating environment for both students and faculty in the department. The best is yet to come.

With God's richest blessings to you,

~ D. David Nowack, Chair

## Alumni Parade



Sarah Johnston, Luis Garibay, Lucyna Krzyswon, Roy Dimuna

Over one hundred students and friends gathered for the Alumni Homecoming Parade at the end of October to produce the first living periodic table at Andrews University. Many students elaborately dressed up to represent their particular elements. There was considerable disappointment when the day's stormy weather forced the cancelation of the event, but we commemorated the occasion with many photographs. We look forward to better weather on our next attempt.

~ Lisa Ahlberg



Satoshi Thiele



Courtney Tait



Brittany Foster



Jeremy Wilson

Update your **Chem Alumni Contact** information on the AU&ME Alumni website, OR E-mail **Chem Alumni Contact** information and pictures to David Nowack at [chemistry@andrews.edu](mailto:chemistry@andrews.edu)