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Nancy Wade

Paul Hopkins, Chair

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Dear Friend of Chemistry,

Another school year has drawn to a close, bringing us again to a time for reflection on where we have been and where we are going.

About 15 years ago, we initiated a departmental graduation ceremony for our undergraduate students and their guests. The goal was to provide an intimate event, where the attention could be on the individual. The first was held in the largest Bagley Hall lecture theater, with room to spare. The ca. 20 bachelor's degree recipients who chose to attend sat in folding chairs set up in the limited space beside the podium. This year, our event filled the Husky Union Building ballroom. Including the nearly 250 baccalaureate students (out of about 400 who will graduate this year) who were there, we estimate that nearly 1,500 people were in attendance. Though an event that fills a ballroom is hardly intimate, the graduates and their proud guests seemed to appreciate this opportunity to celebrate their accomplishments. We were honored to have among our graduates one Dean's Medalist and a President's Medalist.

We are always on the lookout for talented new faculty members. Our faculty search this year was rewarded by the acceptance of Dr. Josh Vaughan, an expert in super-high resolution biomolecular imaging, who will join us this fall. Much of the excitement in research in our field these days is at the interfaces with other fields. Though fundamental research focused firmly in the heart of our field does continue, the fraction of our faculty who work on interdisciplinary problems continues to grow. You can learn more about our newest faculty member on page 3.

The application of new computer technology in higher education has been in the news often recently. Our faculty are among those experimenting with new technology. Previously, I have mentioned online office hours, in which students and faculty members meet virtually. This is only the beginning. One faculty member has plans to develop videos showing how an expert (in this case the faculty member) approaches problem solving in physical chemistry. Another plans to dispense with face-to-face lectures in sophomore organic chemistry this fall, replacing these with short videos. Class times will be used to synthesize information, to apply the content to solve problems. I will no doubt be reporting in future messages on the results of these experiments and others that will follow.

—continued on bottom of page 4

The Esselen Award

The Gustavus John Esselen Award for Chemistry in the Public Interest is one of the most prestigious honors provided by the Northeastern Section of the American Chemical Society. It was presented April 4, 2013, at Harvard University to joint awardees Harry and Catherine Jaynne Boand Endowed Professor of Chemistry Michael H. Gelb (left) and Professor František Tureček (middle). They are pictured here with Professor and Department Chair Paul Hopkins who introduced them at the ceremony. ■

Joel Laino

DEPARTMENT NEWS IN BRIEF

Photos, l to r: Wiktor Wadolowski, Diana Knight

left: An entry-level lab before renovation; right: Bench placement allows for an integrated learning environment that can be used for both laboratory and discussion sessions. Fume hoods no longer line the egress path.

Bagley Hall Lab Renovation

We are thrilled to report that renovation of the third of four Bagley entry-level instructional laboratories was completed in April. The Department is thus one step closer to a time when all of our freshman students will experience chemistry in modern spaces. The renovated space, which was completely gutted and redesigned, now sends a message that laboratory instruction is important and that the students and their work are valued. We are hopeful that funding to renovate the fourth freshman laboratory and the one remaining undergraduate instructional laboratory that is in need of renovation will become available in the not-too-distant future. Stay tuned! ■

"By renovating these labs from 'something out of Dickens' to state of the art, we send a strong message regarding the continuing vital role of laboratory instruction in high-quality science education."

—Joe Norman,
Professor Emeritus of Chemistry

Commencement speaker Richard Mathies (left) with his former graduate student and current professor of chemistry at the University of Washington, Philip Reid.

Kimberly Quigley

Graduation 2013

On June 14, 2013, the commencement ceremony for the Departments of Chemistry and Biochemistry returned to the newly renovated Husky Union Building after two years of being held at a downtown venue. UW alumnus Richard A. Mathies, Dean of the College of Chemistry, Gilbert Newton Lewis Professor, and Director of the Center for Analytical Biotechnology at the University of California, Berkeley, delivered the commencement address to 250 baccalaureates and more than 1,000 guests. Nearly 400 students earned bachelor's degrees in chemistry or biochemistry this year. ■

Joshua C. Vaughan
Assistant Professor

Courtesy of Joshua Vaughan

Ph.D. 2005
Massachusetts Institute of Technology
Physical Chemistry
Advisor: Keith Nelson

B.A. 2000
Reed College
Chemistry

Joshua Vaughan grew up in the San Francisco Bay area and has fond memories of his time in Portland, where he earned a B.A. in chemistry from Reed College. He is excited to return to the Pacific Northwest as the Department's newest faculty member. His graduate studies were in physical chemistry with Professor Keith Nelson at MIT and he has since worked at Harvard University with Professor Xiaowei Zhuang. Josh's research focuses on the development of chemical and optical tools to image biological systems at very high spatial resolution and the use of these tools to study the molecular-level organization of various biological systems.

As a young boy, Josh was primarily interested in harnessing chemistry's power to make large messes, but at Reed, he became fascinated with chemistry both as a way to understand the world and to improve it. At MIT, Josh's graduate research in ultrafast spectroscopy gave him a strong foundation in physical chemistry, optical instrumentation, and the development of new tools to interrogate matter, skills which later proved highly useful.

For his postdoctoral research in biophysics at Harvard, Josh switched from the study of very fast phenomena in crystals and liquids to the study of very small biological objects. His research advisor, Professor Zhuang, suggested Josh build an instrument for improved high resolution optical imaging since he had extensive experience building instruments in graduate school. (This expertise stemmed from the secret disassembly of instruments in his undergraduate lab, and the long nights that followed spent carefully reassembling it all.) However, Josh concluded that much larger gains would be potentially achievable by improving the fluorescent molecules used for imaging instead of the instrument itself. This avenue proved highly successful and became a major theme of Josh's postdoctoral studies.

The UW Department of Chemistry attracted Josh due to the "broad and well-represented traditional disciplines of chemistry" as well as the "thriving culture of interdisciplinary research." Since Josh's research spans chemistry and biology, he sees great potential for collaboration with other researchers at the UW. "While reading publications by various chemistry faculty members I noticed right away that there is a substantial amount of collaboration both within the Department and with other departments at the UW. This made a strong impression on me, and upon visiting, I found that the Department really lived up to my expectations."

Josh's wife, Dr. Juan Zheng, is a chemist as well as an attorney, and has accepted a position at Christensen O'Connor Johnson Kindness, a Seattle law firm that provides legal services related to patents, trademarks, and copyrights. Their one-year-old daughter, Julia, is "well-versed in maximizing disorder in her surroundings".

The Vaughan lab focuses on the development of fluorescent probes for ultrahigh resolution biological imaging and their application to study how macroscopic order emerges in cellular and organelle systems from the molecules which comprise them. A key tool of the lab is super-resolution fluorescence imaging, where photoswitchable fluorescent dyes are used with sophisticated optical microscopes to capture ultrahigh resolution images (25 nm or better) of labeled biological samples. One focus of the lab will be to develop new photoswitchable fluorescent dyes to improve the imaging resolution to just a few nanometers and to extend the ultrahigh resolution imaging capabilities in living samples. A parallel effort will use the imaging tools to study fundamental and applied questions in biology such as how subcellular organelles attain their distinctive shapes, how the shapes of these structures in turn give rise to their specialized functions, and how they are remodeled to meet the changing needs of an organism. The lab anticipates using its specialty techniques and instrumentation to collaborate with other UW researchers to examine wide ranging problems in fields such as neurobiology, oncology, and bacteriology. ■

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National Organic Symposium

Eiichi Nakamura

Professor Emeritus John D. Roberts at the 43rd National Organic Symposium at the UW.

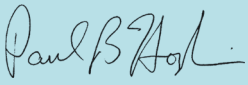
In June, our campus was honored to host the 43rd National Organic Symposium (NOS) sponsored by the American Chemical Society. For five days, organic chemists from around the world gathered in Meany Hall to discuss advances in organic chemistry ranging from the synthesis of complex organic natural products, to custom-synthesized carbon nanotubes, to building self-assembling three-dimensional objects using duplex DNA as a building block. It was not the first time this meeting has been held locally: the 16th NOS was held on our campus in 1959. Professor Emeritus John D. Roberts of Caltech was a speaker at the 16th meeting; we were honored to have him as an attendee at the 43rd. ■

—LETTER FROM THE CHAIR
continued from page 1

It is a great pleasure to report some positive news on the subject of state funding for higher education. At the end of June, our state legislature voted to restore about 20% of the state funding that the UW lost in the previous two biennial budget cycles: about $40,000,000/year was restored (compared to $200,000,000/year lost). As a result, for the first time in many years, Washington state resident undergraduates at the UW will see no increase in tuition for at least one and perhaps two years.

Before we know it, the 2013–14 academic year will be upon us. We look forward to continuing to pursue our missions of instruction and research.

As always, I hope you enjoy this edition of the *ChemLetter*. Please accept my best wishes, and please stay in touch!



Paul B. Hopkins
Professor and Chair