A MESSAGE FROM THE SCHOOL HEAD

Welcome to the Diffusion, the second issue of the CBEE Newsletter. In this issue, we profile just a few of the outstanding faculty and students that exemplify the unique character of this School. We will also bring you up to date on some of our current activities. In this spirit, we also want to hear from you, our alumni and friends! If you have a story or news to share, please contact us!

My best,
Greg Rorrer
Professor & Head
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NEW FACES

The College of Engineering and the School of Chemical, Biological, and Environmental Engineering are pleased to announce that five new faculty have been hired to start out the 2013 school year.

Working clockwise from left:

**Travis Walker – Ph.D., Chemical Engineering, Stanford University, 2013**

Travis Walker joins Oregon State following a productive doctoral program at Stanford that included five publications, 16 presentations, teaching experience, and multiple national awards. Walker’s current research combines experiment and theory to understand the flow physics of miscible, often non-Newtonian, liquids and complex fluids. Two examples of problems he investigates are exploring an expanded range of fluid mechanical operating conditions and fluid properties to uncover new morphological regimes, and examining how rheological changes in mucus affect cilia transport in patients with cystic fibrosis.

**Devlin Montfort – Ph.D., Civil Engineering, Washington State University, 2011**

Devlin Montfort is a co–principal investigator on a National Science Foundation-supported project that is developing research–based curricular materials to improve conceptual understanding in engineering education. He conducts research in engineering education, focusing on conceptual change and understanding, personal epistemology, and adoption of innovations. His work examines the ways in which people’s assumptions, previous knowledge, and personal epistemologies influence their learning. Understanding how people incorporate new ideas and ways of thinking is critical to helping students develop into innovative, highly skilled, and well-rounded engineers and citizens.

**Tyler Radniecki – Ph.D., Chemical and Environmental Engineering, Yale University, 2005**

Tyler Radniecki begins his appointment at Oregon State University having already secured grants from the National Science Foundation and the Department of Agriculture to pursue his research interests of biological processes in sustainable wastewater treatment systems and reuse applications. He examines the fate of nanoparticles in wastewater treatment plants and their toxicity to beneficial wastewater bacteria, the propagation of antibiotic resistance in bacteria exposed to pharmaceutical-containing wastewater effluent used for irrigation, and how wastewater treatment plants can become net energy producers through the anaerobic transformation of fats, oils, and greases into methane. These studies will create a more robust, safer, and sustainable form of wastewater treatment that will ensure the production of safe and clean water for reuse purposes, and provide renewable energy solutions.

**Elain Fu – Ph.D. Physics, University of Maryland, College Park**

Elain Fu joined the School of Chemical, Biological, and Environmental Engineering at Oregon State University in the fall of 2013. Elain was a Research Assistant Professor in the Department of Bioengineering at the University of Washington from 2010 to 2013. Elain’s research program encompasses microfluidics-based sensor technology development with the aims of understanding the physics and chemistry of device operation and increasing device performance for field applications. Recently, her research focus has been on the development of “paper” networks to enable high performance testing in a simple disposable format that is appropriate for use in even the lowest-resource
SRG PartNERSHIP INC. SELECTED TO DESIGN AND CONSTRUCT NEW HOME FOR CBEE

A new $40 million engineering building is to be constructed just north of Kelley Engineering Building. Construction on the three-story, 60,000-square-foot building is scheduled to begin in summer of 2014, and completed in the fall of 2016. During the 2013 session, the legislature approved public bonding for half of the costs with the other half provided by donors to the Campaign for OSU. Peter and Rosalie Johnson contributed $7 million and an anonymous donor gave $10 million.

SRG Partnership, Inc. was selected to design, plan, and construct the new home for the School of Chemical, Biological, and Environmental Engineering. SRG is the architectural firm responsible for the Valley Library remodel and addition, the construction of Richardson Forestry Ecosystem Research Laboratory, as well as the well-known Lokey Laboratory at the University of Oregon campus.

While not a CBEE exclusive building, many features for CBEE research and education are being included in Johnson Hall:

- Approximately fourteen thousand square feet of research space
- Shared “Research Neighborhoods” designed for multiple modules & collaboration
- Unit operations and projects laboratory
- Roughly twenty new faculty offices
- Conference and meeting space
- Ample work and desk space for graduate students

NEW SPACES

Líney Árnadóttir - Ph.D., Chemical Engineering, University of Washington, 2007

Líney Árnadóttir begins her appointment at Oregon State with a grant from the American Chemical Society Petroleum Research Fund, a donated X-ray photoelectron spectroscopy system, and a funded instrumental and computation user proposal at Pacific Northwest National Laboratory. Árnadóttir’s current area of study involves the examination of the role of surface defects and electronic structure in activating water dissociation and CO2 reduction on novel materials such as nanodimensional noble metal clusters and metal oxides. Understanding how the reaction energy correlates to surface properties will lead to more efficient and sustainable catalytic processes.
CBEE CLUB SHINES AT 2013 ANNUAL AICHE MEETING

The American Institute of Chemical Engineers (AIChe) Annual Student Conference met at the Hilton San Francisco, CA on November 1-5, 2013. CBEE was represented by an outstanding 28 undergraduate students from all three program disciplines. 11 students presented posters (a new record) and we had several winners listed below (including the PI/Lab they conducted their work in).

AIChe National Student Paper Competition
1st Place Colin Dickens (Subramanian, Chemistry) – First National winner from OSU in the last 20 years!

AIChe Student Poster Competition
We had 11 students present posters...a new record. And we had 5 WINNERS.
Rachel White (Subramanian, Chemistry) – 2nd Place Engineering Education
Lynda Bradley (Kelly, BIOE) – 2nd Place – Biotechnology
Hannah Bulovsky (Harper, ENVE) – 3d Place Environmental Science and Engineering
Stephanie Rich (Semprini, ENVE) – 2nd Place Environmental Science and Engineering
Chelsea McConnell (M.I.T. BIOE) – 2nd Place Materials Science and Engineering

The CBEE Student Club was also presented with the AIChe Outstanding Student Chapter Award while at the conference. The club has been honored with this award 14 of the last 15 years!

CBEE LAUNCHES ENVIRONMENTAL ENGINEERING GRADUATE PROGRAM
A first of its kind in the state of Oregon, the graduate studies program in Environmental Engineering at Oregon State University emphasizes the understanding of fundamental scientific and engineering principles to manage and solve environmental problems in natural and engineering systems. The instructional program is designed to develop strong analytical, design, and management capabilities in the application of biological, chemical and physical processes. Students are prepared for careers in consulting and design, environmental monitoring and management, or teaching and research. Research focuses on hazardous substances, environmental microbiology, fundamentals of transport processes in the environment, environmental chemistry, and groundwater and surface water resources.

With a faculty team including doctors Dolan, Harper, Nason, Semprini, Wildenschild, and Wood, the School of Chemical, Biological and Environmental Engineering currently offers Master of Science (MS), Master of Engineering (Coursework Only) (MEng), and Doctor of Philosophy (PhD) degrees in Environmental Engineering. All programs are tailored to individual student needs and professional goals. A diversity of faculty interests, broadened and reinforced by cooperation between CBEE and other engineering departments and research centers on campus, makes tailored individual programs possible.
2013 CBEE OREGON STATERS - OUTSTANDING ALUMNI AWARDS

In 1998, the College introduced the annual Oregon Stater awards to honor outstanding alumni and friends for their contributions to the engineering profession and to Oregon State University. There are three award categories determined by length of career and accomplishments:

Engineering Hall of Fame – Membership in the OSU Engineering Hall of Fame is reserved for Oregon Staters who have made sustained and meritorious engineering and/or managerial contributions throughout their careers.

Academy of Distinguished Engineers – Membership in the OSU Academy of Distinguished Engineers is awarded to mid-career Oregon Staters who have sustained distinguished contributions to the profession, field, OSU, or society at large. They have at least twenty years of experience beyond the BS and are still practicing their profession.

Council of Outstanding Early Career Engineers – The OSU Council of Outstanding Early Career Engineers is reserved for Oregon Staters who have distinguished themselves through professional practice and/or service to OSU, the profession, or society at large. These individuals have made early career contributions that identify them as future leaders in their profession or field. They have less than 20 years of professional experience beyond receipt of their bachelor’s degree.

MICHAEL BRADY: ENGINEERING HALL OF FAME
PH.D. CHEMICAL ENGINEERING ’69

A man of humble beginnings, Michael Brady grew up in Iowa and primarily put himself through Iowa State University earning a B.S. in chemical engineering. He worked as a technician at the Atomic Energy Commission’s Ames Laboratory and completed internships at General Motors and Ethyl Corporation. He was awarded a National Science Foundation traineeship and headed to Corvallis for his doctoral studies.

DONALD PETTIT: ENGINEERING HALL OF FAME
B.S. CHEMICAL ENGINEERING ’78

Donald Pettit has traveled from Silverton, Oregon, to infinity and beyond with a stop in Corvallis in between. As an earth-bound undergraduate at Oregon State University, Pettit earned his bachelor’s degree in chemical engineering in 1978 and went on to complete doctoral studies in the same discipline at the University of Arizona in 1983. All before spending more than 370 days in space.

THOMAS GOULD: ACADEMY OF DISTINGUISHED ENGINEERS
B.S. CHEMICAL ENGINEERING ’68

In the waning days of the slide rule — the mechanical analog computer utilized by mathematicians and engineers for centuries — Thomas Gould was happy to be at a university that was somewhat uniquely beginning to teach computer science to its chemical engineering students. The cutting-edge skill served him well.
STEVEN LOCKE : ACADEMY OF DISTINGUISHED ENGINEERS
B.S. CHEMICAL ENGINEERING ’82

Steve Locke followed in his father’s footsteps when he enrolled in chemical engineering at Oregon State. Ed Locke had received his chemical engineering degree from Oregon State College in 1947. As soon as he graduated, the younger Locke took a job as a process engineer with Chevron USA. In 1987, he made the leap from hands-on industry to environmental consulting with SRH Associates, SECOR International, and currently at the United States branch of SLR International, an international environmental consultancy with offices around the world.

GREGG LANDSKOV : COUNCIL OF OUTSTANDING EARLY CAREER ENGINEERS
B.S. CHEMICAL ENGINEERING ’95

Oregon State University was an ideal place for Greg Landskov — a fantastic mix of challenging classes, nurturing atmosphere and great people. “My OSU education taught me how to think critically and approach problems systematically,” says Landskov. “Perhaps most importantly, I learned just as much outside of the classroom as in it. I learned about life — that is the sign of a special place.”

CALLAHAN FACULTY SCHOLAR IN CHEMICAL ENGINEERING

In 2011 Darry Callahan (ChE ’64) and his wife, Betty, established the Callahan Faculty Scholar Endowment Fund in Chemical Engineering to help OSU continue to power the world.

We are pleased to announce that in 2013 Dr. Karl F. Schilke was named the Callahan Faculty Scholar in Chemical Engineering. A new assistant professor in the School of Chemical, Biological, and Environmental Engineering, Schilke’s research centers around the development of commercially viable surfaces that can be integrated into microscale devices — so that, for example, such a device can release a drug at the desired rate, while preventing blood from clotting and plugging up its channels. His research shows promise for ensuring safety, reducing the cost, and improving the performance of biomedical devices.

Dr. Schilke earned his bachelor’s degree in food science at Oregon State before going on to complete his doctoral degree in chemical engineering and receive OSU’s 2008 Schulein Award as the Outstanding Graduate Student in Chemical Engineering. He spent several years in the Bay Area and Portland, and has worked as a network engineer and systems administrator for Cisco, NASA, and Electric Lightwave.
During the 2012–2013 academic school year, the College of Engineering conducted a search to fill two newly created positions within the Dean’s Office. The Associate Dean of Research and Economic Development and the Associate Dean of Academic and Student Affairs. Elisha Brackett, School Manager for CBEE, recently sat down with CBEE Associate Professor Christine Kelly to discuss her new role as the Associate Dean for Academic and Student Affairs.

Christine, tell us a little about your new position and your motivations behind the change.

Christine: When Sandy first announced at the Fall (2012) breakfast that she was implementing these two Associate Dean positions, my first thought was if I could up and get more sausage while she is talking or that would be too obvious? It wasn’t until I was sitting at my desk with the emailed position descriptions that I realized the congruence in my interests with the ideals for this position. I decided to seek advice from colleagues and here I am.

It is as much as I expected. Currently I oversee College of Engineering Undergraduate Programs Office, Women and Minorities in Engineering (WME), and the Louis Stokes Alliance for Minority Participation (LSAMP) Program. For me, this position is less stressful and I find myself less reactive as I work with a larger perspective of all aspects that make COE run. I get to maintain a more “giving” nature rather striving to build my own personal kingdom.

What have been the biggest gain and the biggest challenge so far?

Christine: The biggest gain so far is the breadth of people I get to meet, talk to and work with across the College. As an extroverted engineer, I appreciate the interaction with students and helping to ensure student success.

The biggest challenge has been stepping into a new position that didn’t exist prior. The duties are somewhat vague as they are being created and divided amongst the current administration. It forces me to figure out a balance and the focus.

Knowing you still love CBEE, what do your continued connection to the School involve?

Christine: I am still helping to advise a few of the students I have seen through their academic careers here in CBEE. I am working closely with them and helping them to finish successfully with the courses they need.

I am cutting back on the teaching, but will still teach BIOE 490 (Bioengineering Process Design) in the Winter term. This will help keep my connection to the bioengineering academic program and the students I love!

I am also still maintaining my research lab. I am currently advising two graduate students: Bryan Kirby (MS Chemical Engineering) and Xuwen Xiang (CHE MS ’13, PhD Chemical Engineering). I also have several undergraduate researchers in my lab. Undergraduate research is important to me and I enjoy the research that I have built.
RESEARCH HIGHLIGHTS & STUDENT PROFILES

John Mills, Interim Internship Coordinator, recently conversed with two current CBEE students to get a deeper perspective on the interesting activities of our future shining stars!

“A PROVOST FELLOW WITH A PASSION FOR RESEARCH AND EQUALITY”
ALYSSA DELINE, PH.D. STUDENT, ENVIRONMENTAL ENGINEERING

Graduate student Alyssa Deline’s path to CBEE began at San Diego State University with an undergraduate degree in Chemistry. While there, Deline was able to take advantage of an opportunity to study the toxicity of silver nanoparticles to ammonia oxidizing bacteria with Dr. Tyler Radniecki – who also found their way to OSU’s CBEE school for the 2013 school year. It was this experience that showed Deline that what she really wanted to do with her chemistry background was apply it to environmental problems – which soon led her to pursuing a graduate degree in Environmental Engineering.

Being fortunate enough to receive a Provost Fellowship at OSU, Deline has been able to explore several research projects with faculty members before having to make a decision on the direction she’s headed. While having just started getting into research, Deline is looking forward to working with Dr. Jeff Nason on the development of labeled metal oxide nanoparticles (this project was discussed briefly in the Winter 2013 edition of Diffusion).

While research into nanoparticles brought Deline to OSU, laboratory experiments aren’t the only thing that drives her forward. Deline states that she is very interested in addressing gender disparities in STEM fields. At SDSU, Deline mentored a group of female undergraduate students and helped tutor them in their introductory chemistry courses.

“That was an amazing experience; I definitely learned as much as they did if not more. I am leaning towards remaining in academia after graduate school, but no matter what I end up doing I hope to remain active in expanding opportunities available to young women in the sciences.”

“I am very passionate about research. I love the feeling of going into the lab and creating something new, and I also really enjoy learning new analytical techniques.” - Alyssa Deline
Shelby Foley, an undergraduate student currently pursuing a degree in Environmental Engineering, originally hails from the town of Red Bluff, California – a small town of fewer than fifteen-thousand residents well known for its annual Red Bluff Round-Up rodeo. Unfortunately, the small town is also known for a higher than average rate of government financial assistance and a much lower than average college attendance rate. Neither of these facts, however, has prevented Foley from following her passions as she supports herself through her collegiate career.

When asked specifically what drives her, at the top of Foley’s list was “Reducing impact / resource conservation” and “working towards sustainability”. These ideals are clearly reflected in her work and internship experiences. Beginning in the summer of 2011, Foley participated in a grant-funded program with the Resource Conservation District to work with agricultural growers to optimize their systems in order to save both money and water. With agriculture being the largest use of water in the United States, Foley found working with growers of all sizes rewarding because she was able to help them reduce their impact. Perhaps even more importantly, the experience encouraged her to stay in engineering because of her desire to work on technical projects.

From there, Foley participated in a summer internship with International Paper, getting to work with process and environmental engineering in an industrial setting. The experience gained working with heat recovery, recycle streams, waste minimization, and project management most certainly helped Foley with her current projects working at the OSU Energy Efficiency Center (EEC). Beginning in March of 2014, Foley joined the EEC and now works with Director Joe Junker ten hours a week to study the reduction of environmental impact through the reduced energy consumption and learn more on how different facilities manage waste treatment. Foley’s appointment with the EEC will continue through the summer of 2014, post her graduation from CBEE.

The EEC houses the OSU Industrial Assessment Center and offers Rural Energy Audits, OSU facility assessments, and other customized assessments. The center focuses on mentored energy efficiency training, performs related research, data accumulation and analysis and offers other related services.
ABOUT CBEE

The School of Chemical, Biological, and Environmental Engineering (CBEE) at Oregon State University is home to BS undergraduate programs in chemical engineering, bioengineering, and environmental engineering, and graduate programs in chemical engineering and environmental engineering leading to MEng, MS and PhD degrees. The School has 24 full-time faculty, and currently enrolls over 1000 undergraduate and 100 graduate students. The School emphasizes the integration of chemical, biological and environmental engineering principles and practice in a student-centered learning environment to provide work-ready graduates and technical solutions for a sustainable future. Research expenditures exceed 3.5 million dollars per year, and current emphasis areas include thin films and nanostructured materials for renewable energy and electronic device applications, bioprocess engineering and biofuels, biomaterials & therapeutics, transport and remediation of contaminants in the subsurface, interaction of nanomaterials with the environment, microtechnology for chemical and energy processing applications, and engineering education research.

UPCOMING EVENTS

ENGINEERING AWARENESS WEEK: JANUARY 13–17TH
The College of Engineering will host several events for students interested in a degree in engineering.

MLK HOLIDAY AND PEACE BREAKFAST: JANUARY 20TH
Offices are closed and no classes are held in honor of Dr. Martin Luther King Jr. Join OSU for a Peace Breakfast, 9:00 a.m.–11:00 a.m. in the Memorial Union Ballroom.

AICHE PACIFIC NW STUDENT REGIONAL CONFERENCE: APRIL 25–27TH
This year’s conference is set to take place at Washington State University.

ENGINEERING EXPO: MAY 16TH
Student projects are on display in Kelly Engineering Center.

INDUSTRY ADVISORY BOARD: MAY 16TH
The CBEE Industry Advisory Board will host their spring meeting event.