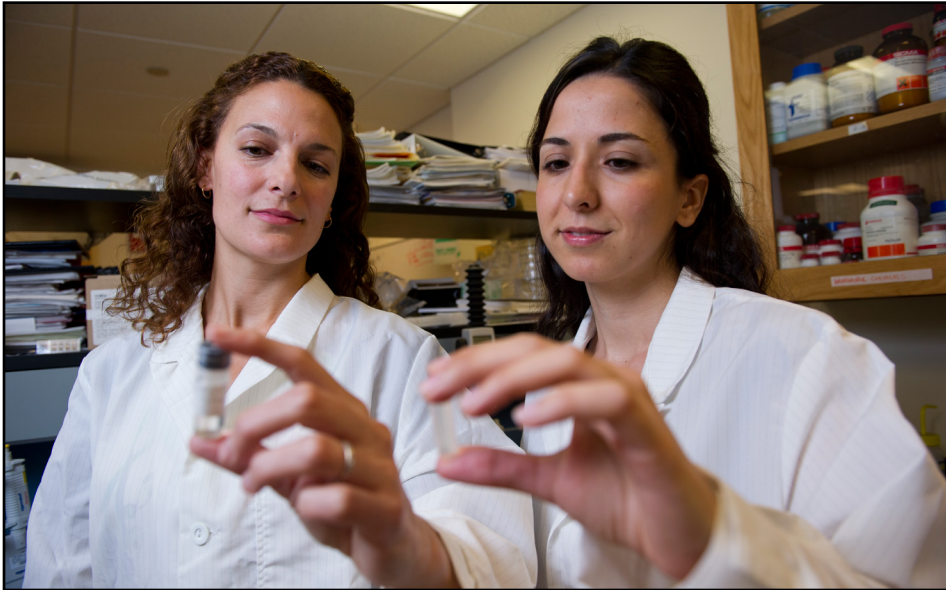


Chemical Engineering News

STARTING THE NEW YEAR WITH UNPRECEDENTED MOMENTUM



The rapid growth within the Department of Chemical Engineering at Northeastern is garnering national attention. Compared to just a year ago, undergraduate enrollment has doubled, graduate program selectivity has doubled, international student exchange opportunities have quadrupled, and the Department has hired six new full-time faculty and staff to keep up with the pace. Further, current faculty continue to make waves as many have published in top research journals, received patents, and secured new grants to conduct cutting edge research. We also congratulate Prof Rebecca Carrier (pictured above [left]) with her graduate student, Fulden Buyukozturk [right]), who was appointed Associate Chair for Research, Prof Hicham

Fenniri, who was appointed Associate Chair for Graduate Studies, and Prof. Kate Ziemer, who was appointed Vice Chair.

Now considered a top department of its kind, Chemical Engineering at Northeastern is making a global impact. From cutting edge research in areas like nanomedicine and biomaterials to innovative educational programs like international research exchanges (the first of its kind in the College) and coop, our department is fast becoming a flagship of not only the College but the entire University.

With yet more room to expand, the Department will continue to be aggressive in seeking out growth opportunities in the new academic year, so stay stuned!

MESSAGE FROM THE CHAIR



Welcome to our latest issue of the Department of Chemical Engineering Newsletter. We have declared this year our 'Record Breaking Year'!

From a record high number of faculty, enrollments, faculty awards, conferences attended, and recognition for our unprecedented growth, we are very much on the move. For example, this past summer we began our first-ever Undergraduate International Research Exchange Program with universities in Spain and Singapore. We also continue to be recognized as among the fastest growing and most prestigious chemical engineering departments in the nation. Our students (both undergraduate and graduate) are setting the world on fire, ranging from a record number of conference presentations to research awards. In this newsletter, you will see how our students (both undergraduate and graduate) are taking advantage of our unique co-op program and international experiences to gain global industry, research, and community service experience. So watch out, our students will be setting even more records next year, and nothing could make us more proud!

– *Thomas J. Webster*
Arthur W Zafropoulos Chaired Professor
Department Chair
Department of Chemical Engineering





UNDERGRADUATE SPOTLIGHT: ALEXANDER COLVILLE

A native of Scarborough, Maine, Alex Colville is entering his senior year at Northeastern. He chose the Chemical Engineering program because of the strong track record of Department alumni and the wide-ranging skill set that Chemical Engineers possess. "Chemical Engineers can tackle the world's biggest problems," says Alex, "from bioengineering to alternative energy."

In his first co-op experience, Alex worked at Selecta Biosciences, a biopharmaceutical start-up firm, where he assisted in the the research and development of novel nanoparticle vaccines. From there, Alex participated in a second co-op experience at Putnam Associates, a consulting firm serving clients in biopharmaceuticals and biotechnology. In this capacity, Alex advised clients in various business strategies, including market access, pricing, and portfolio optimization.

While most students take it easy in the summer time, Alex participated in the Department's inaugural Undergraduate International Research Exchange Program at Universitat Rovira i Virgili in Spain last summer. While there, Alex investigated the microscopic modeling of the self-assembly of pluronic surfactants for drug delivery applications, which is leading toward a journal publication and the opportunity to present his findings at this year's AIChE Annual Meeting.

Just as active on campus, Alex is co-founder of the NU chapter of BMES, former President of NU AIChE, and also serves on the search committee for the chair of the newly formed Bioengineering Department.

In what little spare time he has left, Alex is an avid skier, golfer, and hiker.

Best of luck, Alex, in your future pursuits!

APPLY NOW

The Department offers several undergraduate programs of study.

Apply for undergraduate admission at <http://www.northeastern.edu/admissions>



My Experience Abroad

ChE undergraduate Michael Galluzzo spent the summer at Universitat Rovira i Virgili (Spain) in a Department-sponsored exchange. This is his experience.



While in Tarragona, Spain, I got the chance to work on a project focused on synthesizing and characterizing proton exchange membranes. I conducted hands-on research in an organic chemistry lab where my role was to attempt to reproduce the synthesis of the polymer linear polyglycidol while attempting to maximize the molecular weight of the compound. The polymer I created would then be modified in an attempt to create a self-aligning helical structure capable of the selective transport of protons through the membrane. This type of non-ionic membrane could have huge implications for fuel

cell applications. While working in Spain, I got a lot of experience with organic chemistry techniques but also interacting with members of the scientific community with very diverse backgrounds. I got the opportunity to work with professors and graduate students from Spain, Italy, Poland, Venezuela, Turkey, and several other countries. Each individual brought a different approach to problem solving and a unique type of creativity. I was fortunate to work in an environment where people were always willing to share ideas and knowledge. During my time in Spain, I learned a lot about chemistry and the work I was doing,

but also had a lot of time to experience a very different culture than what I am used to in Boston. Between the beaches, Roman architecture, food, and the people, there was always something to do and see around Tarragona. Being submersed in a totally new culture taught me a lot about myself and how to adapt to new environments. While I walked away with a valuable research experience, I also had an amazing time exploring Spain and all that it had to offer.

– Mike Galluzzo, Class of 2016

GRADUATE STUDENT SPOTLIGHT: STANLEY CHUNG

Mr. Chung is a highly active, second year PhD student working in Prof. Thomas Webster's Nanomedicine Research Group.



Stanley Chung possesses a B.S. in Chemical and Biomolecular Engineering from Johns Hopkins University. He discovered a particular passion for research during his M.S. study on increasing mammalian membrane protein production, also at Johns Hopkins.

After graduation from Johns Hopkins in 2011, Stanley moved to Boston to work at Abpro, a small biotech startup firm focused on developing custom antibodies for educational and industry partners. While there, he decided to pursue doctoral studies at Northeastern because of

the institution's strong connections with the city's vibrant biotech industry and the myriad of research opportunities.

In the lab, Stanley is working towards the creation of electrospun scaffolds that mimic a cell's native environment in order to investigate the newly discovered wound healing properties of human mesenchymal stem cells. Successful completion of this project would help change the paradigm of medicine from treatment to healing or regenerative medicine.

Stanley has already published in the *Journal of Biomedical Materials Research*, for investigating the use of sodium hydroxide treatment in improving the antibacterial properties of poly-lactic-co-glycolic acid (PLGA) films, a commonly used commercial biomaterial.¹ In addition, he also has submitted pending manuscripts for his work in improving the antibacterial properties of polyhydroxybutyrate (PHB) and drug eluting metals.

In 2014 alone, Stanley has presented his research at various conferences, including the Society for Biomaterials Annual Meeting, the Northeast Bioengineering Conference, and the International Translational Nanomedicine (ITNANO) Conference.

In his free time, Stanley likes to explore the vibrant city of Boston, particularly its many restaurant and cafe options. He also likes to visit the area's world-class museums, such as the Museum of Fine Arts (just down the road from campus) and the Museum of Science. During the summer and fall months, you will be sure to find Stanley outside somewhere playing soccer or frisbee.

empower

Your support is essential to furthering our mission to provide our students with education and experiences that will help transform their lives. It will also provide scholarships to students, develop new chemical engineering programs, and contribute to new facilities and equipment.

Gifts By Telephone: To make a gift by telephone, please call (617) 373-5520 during regular University business hours of 8:30 a.m. to 4:30 p.m., Monday through Friday. Be sure to designate your gift in support of the Department of Chemical Engineering.

Online Gifts: www.neu.edu/giving/
You will have an opportunity to designate your gift to the College of Engineering.

Gifts by Mail: To mail in a gift, please make your check payable to Northeastern University and send it to:

*Development and Alumni Affairs
College of Engineering
Snell Engineering Center, Room 147
Northeastern University
360 Huntington Avenue
Boston, MA 02115*

Please indicate *Department of Chemical Engineering* on the memo line to designate your gift.

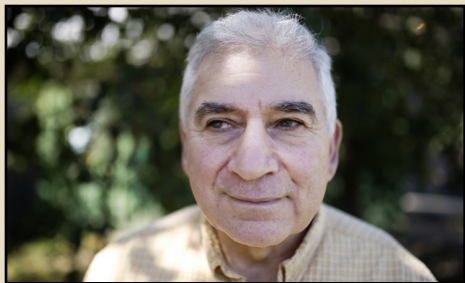
Thank you!

APPLY NOW

The Department offers both MS and PhD programs. Apply for graduate admissions at <http://www.northeastern.edu/graduate/>

¹Karahaliloğlu Z, Ercan B, Chung S, Taylor E, Denkbaş EB, & Webster TJ 2014. Nanostructured anti-bacterial poly-lactic-co-glycolic acid films for skin tissue engineering applications. *J Biomed Mater Res Part A* 2014:00A:000-000. Available online at: <http://onlinelibrary.wiley.com/doi/10.1002/jbm.a.35141/pdf>

THREE NEW FACULTY JOIN THE DEPARTMENT



Arthur Coury, Professor

A National Academy of Engineering member and research expert in polymeric biomaterials for medical products, Dr. Coury also holds the title of Director of the Engineered Biomaterials Program where he will seek out research collaborations with industry leaders in engineering. In 2007, the Society for Biomaterials named Dr. Coury one of "100 Notable People in the Medical Device Industry."



Abigail Koppes, Assistant Professor

A product of Northeastern's STEM Future Faculty Fellowship Program, Dr. Koppes had been working in the Advanced Drug Delivery Lab of Dr. Rebecca Carrier prior to her appointment. She is an expert in the field of novel biomaterials and devices to treat central and peripheral nervous system injuries.



Ming Su, Associate Professor

Dr. Su operates a multi-disciplinary research program targeting the areas of nanoparticles, disease detection (primarily cancers, Alzheimers disease and infectious diseases), radiation therapy and high capacity taggants. Dr. Su holds 2 PhDs, in Physical Chemistry from the Chinese Academy of Sciences, and in Materials Sciences & Engineering from Northwestern University.

DEPARTMENT BLOTTER

- Dr. Thomas Webster has been named President-elect of the U.S. Society for Biomaterials.
- Dr. Ron Willey was awarded a patent for his method of creating "Titania nanotubes prepared by anodization in chloride-containing electrolytes".
- Caroline Webb is the recipient of a 2014 Provost Undergraduate Research Award to investigate the effect of hormone treatments on the expression of ZCT1 in transgenic *Catharanthus roseus* hairy root cultures.
- Dr. Rebecca Carrier was awarded a grant by the March of Dimes to study the role in necrotizing enterocolitis (NEC) & prophylactic mucus strengthening treatment to prevent NEC.
- Dr. Thomas Webster was selected as one of the Most Influential Scientific Minds in Materials Science by Thomson Reuters.
- Dr. Thomas Webster and M.S. student Run Chang have created a nanoparticle delivery system which could target and destroy cancer cells.
- Dr. Shashi Murthy, in collaboration with Hebrew University of Jerusalem has been awarded a grant from the U.S.-Israel Binational Science Foundation to pursue the development of new surface coating technologies in devices utilized in stem cell purification.
- Dr. Edgar Goluch was awarded a National Science Foundation (NSF) grant to create a nano-constriction device to automatically isolate and cultivate microbes in their own habitat.
- Ph.D. student Noreen Rizvi, advised by Dr. Carolyn Lee-Parsons, was awarded an American Association of University Women's American Dissertation Fellowship.



Vice Chair Kate Ziemer and Chair Tom Webster receive a special gift at the 2014 Chemical Engineering Awards Ceremony that all department chairs should have on hand: Advil!

DEPARTMENT BLOTTER CONTINUED

- Dr. Richard West was awarded a NSF Grant to identify and resolve discrepancies in kinetic models of hydrocarbon combustion.
- Dr. Laura Lewis was featured in the Boston Globe for her research into creating new supermagnets to replace rare-earth magnets.
- Seven ChE undergraduates were selected for the Huntington 100, a university honor that recognizes 100 students for their extraordinary achievements.
- Dr. Richard West was awarded an American Chemical Society Doctoral New Investigator grant for his proposal entitled, "Transition-State Prediction for High-Throughput Calculation of Accurate Chemical Reaction Rates."
- Dr. Behrooz "Barry" Satvat is the recipient of the 2014 Dr. R. H. Sioui Award for Excellence in Teaching.
- PhD student Sydney Shaw received 1st place for her poster presentation at the Northeast American Society of Plant Biology Annual Meeting; PhD student Noreen Rizvi received 1st place for her oral presentation at the same conference.
- Dr. Shashi Murthy is one of fifty researchers in the US selected to participate in the Second Arab-American Frontiers of Science, Engineering, and Medicine Symposium.
- Dr. Sunho Choi, Dr. Adam Ekenseair, Dr. Edgar Goluch and Dr. Shashi Murthy were among 19 COE recipients of Interdisciplinary Research Seed Grants from the Office of the Provost at Northeastern.
- Dr. Thomas Webster was featured in the Boston Globe for his work on improving surgical recoveries through the use of nanomaterials.
- Dr. Courtney Pfluger led 24 undergraduates on a Dialogues of Civilizations course in Brazil. The course focused on alternative energies.
- PhD student Nil Tandogan received a honorable mention for her poster presentation at the Northeast Bioengineering Conference.
- Dr. Richard West was awarded a NSF Grant to identify and resolve discrepancies in kinetic models of hydrocarbon combustion.
- Dr. Hicham Fenniri and Dr. Thomas Webster received a patent, 'Nanotubes and compositions thereof,' by the USPTO.
- Undergraduate student Paul Maschoff is the recipient of the 2013-14 Donald F. Othmer Sophomore Academic Excellence Award by AIChE.
- Dr. Eno Ebong published critical data in The Royal Society of Chemistry on the response of blood vessels to the force of flow.
- Dr. Elizabeth Podlaha-Murphy was selected to be a member of The Electrochemical Society's Ways and Means Committee.
- Dr. Abigail Koppes was featured in the Annual Review of Biomedical Engineering for her analysis of the methods of electrical stimuli used to manipulate the central nervous system.



PhD Student Sydney Shaw looks on at the 2014 Chemical Engineering Awards Ceremony.

Upcoming Conferences Hosted by ChE Faculty @ Northeastern

AIChE Northeast Regional Student Conference

- Host: Dr. Courtney Pfluger
- March 7 - 8

Northeast American Society of Plant Biology

- Host: Dr. Carolyn Lee-Parsons
- April 11 - 12

American Society of Engineering Education Northeast Regional Conference

- Host: Dr. Katherine Ziemer
- April 30 - May 2

More details coming soon!

Did you know? We have a Linked In group, Northeastern University Chemical Engineers. You can also follow the entire COE on Twitter: @NortheasternCOE, and Facebook (<https://www.facebook.com/nucoe>). For comprehensive coverage of Chemical Engineering News, visit us at che.neu.edu/news/index.html



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