



CEEES GRADUATE STUDENT NEWSLETTER

March 2016



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DGS' DESK

Here we are, a few days away from Spring Break! Time seems to fly by while you're having fun conducting research. The final tally for graduate student applications to our department is **173!** 18 applicants have already been admitted, and hopefully all of them will accept their respective offers as they are top-notch applicants.

All graduate students should have their respective **Academic iNDex** profiles up to date since we will be using the latter for your annual progress reports very soon.....If you haven't, you will be receiving a personal email from me reminding you to do so (yes, I will soon have the graduate student usage statistics for Academic iNDex for our department).

Wishing everyone a great Spring Break! I'm off to the Grand Canyon, Meteor Crater, and Death Valley with my petrology students!

Cheers, Tony Simonetti, DGS

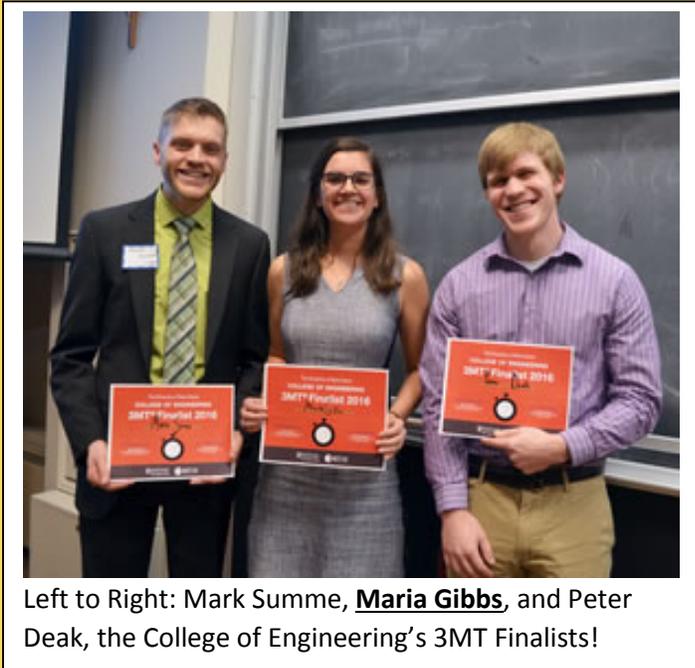
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CONGRATULATIONS!

Congratulations to **Yingying Chen** who received *The Patrick and Jana Eilers Graduate Student Fellowship for Energy Related Research* (partial fellowship, \$6,500). Yingying will focus on the proposed research entitled, *“Engineering robust yeast for enhanced biofuel production from renewable lignocellulosic biomass”*. The scope of the project is to develop an Omics-guided Transcriptome Engineering (OmTE) approach at the laboratory scale and engineer robust yeast platforms for economically viable bioconversion of lignocellulosic biomass. By conducting the proof-of-concept study, Yingying will create an initial resistant strain through global transcriptional perturbation, determine genetic regulatory mechanisms for mixed inhibitor resistance in yeast through comparative transcriptomic analyses and identify relevant transcription factors (TFs).



The perturbation of identified phenotype relevant TFs in wide type strains is desirable to generate a robust yeast strain for efficient fermentation of cellulosic hydrolysates. The overall goal of proposed project is to develop a distinct metabolic engineering approach to improve the resistance of yeast to mixed fermentation inhibitors for harnessing lignocellulosic biomass (advisor: *Dr. Na Wei*).



Congrats and well done to **Maria Gibbs** for being one of 3 finalists from the College of Engineering moving on to the **prestigious Three Minute (3MT) Thesis Finals!!** Maria along with Mark Summe and Peter Deak bested peers in a pool of 11 other challengers. They will go on to compete against finalists from the Colleges of Science and Arts and Letters at the March 16th, 3MT Finals event. The goal of the 3MT competition is for Ph.D. students across all disciplines to explain their research in a language appropriate to an audience of specialists and non-specialists alike, all within three minutes. Competitors must address a live audience and a panel of judges, and their presentations

must be accompanied by a single static slide (Maria's advisor: *Dr. Ahsan Kareem*).

Congratulations to **Zachariah Silver** for being awarded 1st place in student competition at the 19th Conference on Air Pollution Meteorology, at the Annual Meeting of the American Meteorological Society held in New Orleans, January 2016. Zachariah will receive a financial prize and a certificate for his presentation entitled: *"Simulations of Synoptic Flow Modification over Mountain Terrain during MATERHORN Observations Periods"*. (advisor: *Dr. Joe Fernando*)





Congrats go out to **Rob Devine** for accepting a NSF East Asia and Pacific Summer Institutes (EAPSI) award for U.S. Graduate Students! Rob will be conducting analytical & numerical modeling of reinforced concrete nuclear structures with high-strength reinforcement and high-strength concrete at the Earthquake Research Institute, University of Tokyo with Dr. Toshimi Kabeyasawa. This program will be a ten-week experience from mid-June to late August. (co-advisors: *Drs. Ashley Thrall and Gino Kurama*).

ANNOUNCEMENTS

The CEEES 2nd Annual Chili Cook-Off took place on Tuesday, February 16th. Nine home-made chili recipes were entered in the competition, and all of them tasted phenomenal! We wish to thank all who participated and special thanks go out to Mollie, Bonnie, Julie, and Debbie for all their help in organizing the event! As always, their assistance is greatly appreciated! **Karl Cronberger** took first place – Karl’s chili was definitely the most “blistering”, and **Tori and Mike Johnson** placed second! Congratulations to both and looking forward to next year’s cook-off!



Academic Social Happy Hour

Though our February meeting fell on the same day as a major snow event, we were thankful for a modest turnout to enjoy Jimmy John's sandwiches along with our usual fellowship and research presentations. This month's presentations were given by **Maria Gibbs** from *Dr. Kareem's* group and **Marcela Vega Munoz** from *Dr. Nerenberg's* group. Abstracts from their talks are listed below.

Andrew Schranck, Theresa Aragon, Fab Sabba (co-organizers)

Presenters for the Wednesday, February 24th, 2016 event were:

Maria Gibbs (PhD candidate): *"Framework to Predict and Mitigate Wind-induced vulnerabilities of Suspension Footbridges"*



Maria presented her research on wind-induced vulnerabilities of suspension footbridges. Maria is developing a framework to predict and mitigate dynamic wind effects on flexible footbridges which includes using Smart Phones to collect bridge data, wind tunnel testing, and a design thinking approach to developing mitigation solutions that align with stakeholder interests. (Advisor: *Dr. Ahsan Kareem*)

Marcela Vega Munoz (PhD candidate): *"Biological reduction of Perchlorate"*

Perchlorate is a drinking water contaminant found throughout the world. It can inhibit mammalian thyroid function, affecting normal growth and development with especially adverse effects in pregnant women and fetuses. Perchlorate contamination in most of the world is anthropogenic. Interestingly, one of the few natural sources of perchlorate is the Atacama Desert, Chile. The goal of this project is to study perchlorate occurrence in drinking water of selected cities of Chile, together with developing novel biological treatment systems using isolated bacteria from extreme and/or contaminated environments of northern Chile. (Advisor: *Dr. Rob Nerenberg*)





Maria (left) and Marcela (right) in action at Academic Social Happy Hour!

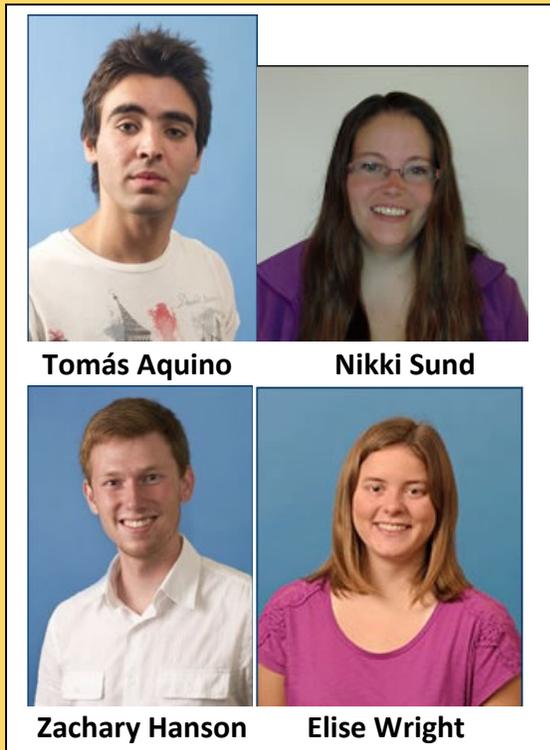
GRADUATE STUDENT “SPOTLIGHT”



Randal Marks - Oxoanions, negatively charged anions consisting of a central atom (N, Cl, Br, Cr, etc) surrounded by oxygen atoms, are common contaminants in drinking water and many are regulated by the EPA. Their high solubility and small size makes their removal from drinking water challenging. Ion exchange, the most common treatment method, generates concentrated waste brines that cause economic and regulatory barriers to disposal. My research focuses on development of photocatalytic systems that utilize solar energy for converting these contaminants to desirable by-products. I use nanosynthetic techniques to develop photocatalysts with high activity under visible light in order to drive efficient and sustainable removal of these contaminants from drinking water sources.

My current research is concentrated on identifying mechanistic steps within the photocatalytic removal process. Many oxoanions can be converted into multiple species of varying value and toxicity. For example, photocatalytic nitrate removal may result in formation of nitrite, dinitrogen, or ammonia. I am using techniques such as ATR-FTIR, sorption studies, and ion chromatography to characterize the intermediates and by-products formed during the photocatalytic process. Identification of key intermediates in the pathway to formation of specific by-products will allow for optimization of photocatalytic system for promotion of desired by-products. (advisor: *Dr. Kyle Doudrick*)

RESEARCH GROUP “SPOTLIGHT”



The Bolster Research Group includes PhD students **Tomás Aquino**, **Nikki Sund**, **Zachary Hanson**, and **Elise Wright**, post-doctoral researcher Abbas FakhariKahaki, and undergraduate student Olivia August. Members of this group come from a variety of backgrounds, ranging from civil and mechanical engineering to physics and mathematics. This lab group focuses on many scales and aspects of fluid motion within the environment, particularly relating to porous media, by implementing various analytical and numerical methods. Much of the work in this group includes the use of Lagrangian particle based methods in order to model transport and reaction of solutes in porous media. For example, recently completed projects used these Lagrangian particle tracking methods to model transport of solutes in rivers and wetlands, reactive transport in heterogeneous aquifers, as well as to model river bed erosion. Previous studies have successfully applied this to

many conservative settings, and the group has now been focusing more heavily on improving the modeling of reactive transport and identifying how to upscale reactions in such systems. Additionally, members of the group have been collaborating extensively with researchers in Notre Dame’s Biological Sciences Department in order to model the transport and processing of carbon in regions of highly concentrated lakes and streams. The goal of this work is to improve the hydrologic modeling of lakes because of the significant role they play in the global carbon cycle. Research being conducted within the Bolster group is currently funded with support from The Army Corp of Engineers, The National Science Foundation, The Portuguese Foundation for Science and Technology, and Notre Dame’s Environmental Change Initiative.

More information on the Bolster Research Group and a list of publications can be obtained at the following website: http://www3.nd.edu/~bolster/Diogo_Bolster/Home.html

THE GRADUATE SCHOOL – SCHEDULE OF DEADLINES

| | Fall 2015 | Spring 2016 | Summer 2016 |
|---|--------------|----------------|----------------|
| Teaching assistant list submitted to Graduate School | Aug. 14 | Dec. 4 | — |
| First class day | Aug. 25 | Jan. 12 | Jun. 13 |
| All course changes | Sept. 1 | Jan. 19 | — |
| Initial graduation list available in GradAdmin (Registrar) | Sept. 8 | Jan. 26 | June 21 |
| Fall/Spring break begins | Oct. 17 | Mar. 5 | — |
| Course discontinuance | Oct. 30 | Mar. 18 | — |
| Preliminary theses/dissertations submitted for formatting check* | Nov. 9 | Mar. 14 | Jun. 20 |
| Thanksgiving break begins (Wed. – Sun.) | Nov. 25 | — | — |
| Easter break begins (Fri. – Mon.) | — | Mar. 25 | — |
| Master's comprehensive examinations & PhD dissertation defenses** | Nov. 30 | Apr. 8 | Jul. 11 |
| All admission to candidacy forms submitted to Graduate School | Dec. 7 | Apr. 15 | Jul. 18 |
| Final theses/dissertations submitted to Graduate School | Dec. 7 | Apr. 15 | Jul. 18 |
| Last class day | Dec. 10 | Apr. 27 | Jul. 22 |
| Final exams begin | Dec. 14 | May 2 | — |
| Graduation date (official degree conferral) | Jan. 3 | May 14 | Jul. 31 |

**Formatting checks should be submitted to the Graduate School when the document is given to readers, at least two to four weeks prior to the defense.*

FELLOWSHIP/SCHOLARSHIP/EMPLOYMENT OPPORTUNITIES

- **Harriet Evelyn Wallace Scholarship**

<http://www.americangeosciences.org/workforce/harriet-evelyn-wallace-scholarship>

- **L'ORÉAL USA FOR WOMEN IN SCIENCE PROGRAM**

http://www.lorealusa.com/Foundation/Article.aspx?topcode=Foundation_AccessibleScience_Fellowships

- **The Smithsonian Institution Fellowship Program (Deadline: September 1st, 2016)**

<http://www.smithsonianofi.com/fellowship-opportunities/smithsonian-institution-fellowship-program/>

NEWSLETTER CONTACTS

If you wish to include or contribute news items for the next issue of the newsletter, please contact one of the editorial members below:

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