



CEEES GRADUATE STUDENT NEWSLETTER

November 2016



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DGS' DESK

Hope everyone enjoyed Fall Break and at the same time got some research work done! Yes, the Fall semester is flying by at break neck speed and before you know it, we'll be carving up the Thanksgiving turkey and starting our Christmas shopping.....

In a few months, some of you will be taking your PhD qualifying exams. Please make sure that you connect (if you haven't already done so) with the 4 faculty members (including your advisor) providing you with the exams.

We will be holding an information session on Academic iNDeX on Monday, Nov. 7th, between 12:00 (noon) and 1:00 pm in 154 Fitzpatrick Hall. It is mandatory for all new graduate students and returning students are encouraged to attend, in particular if they've had issues in the past with inputting information into their accounts.

Lastly, I hope all of you are actively participating in the monthly 'Academic Social Happy Hour' events, which is an excellent venue to get to know what research your colleagues are conducting, and doing so in a relaxed and enjoyable atmosphere!

Best wishes, Tony Simonetti

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ANNOUNCEMENTS

Conferences

Rob Devine attended the American Concrete Institute's Fall Convention: Revolutionary Concrete (October 23-27) in Philadelphia, Pennsylvania where he presented a talk titled *Use of High-Strength Concrete in Low-Rise RC Shear Walls* at a technical session titled *High-Strength Concrete: It is Not Just for Tall Buildings*. The work was co-authored by our own Steve Barbachyn along with Drs. Ashley Thrall and Yahya Kurama.

Thank you

Thank you to the powers that be in the department for providing treats for all the graduate students on Wednesday, October 5 during Graduate Student Appreciation Week and to the wonderful ladies in the main office for organizing it.

Academic Social Happy Hour

Monday, October 31, 2016:

With the semester in full swing, everyone is surely very busy with classes, TA responsibilities, and research. We enjoyed the opportunity to take a break and get together on Halloween to enjoy lots of food and tasty treats inspired by pumpkins, autumn, spooky creatures, and the colors green and orange. We also had the pleasure of learning about the research of two second year graduate students, Michael Brandes and Keith O'Connor (see abstracts below).



Michael Brandes: *“Use of Recycled Concrete Aggregates in Prestressed Concrete”*



This research investigates the long-term (sustained) service-load deflection behavior of precast/prestressed concrete beams that use recycled concrete aggregates (RCA) as replacement for natural coarse aggregates (e.g., crushed limestone, gravel). While the use of RCA is widespread as a sustainable alternative to natural aggregates in non-structural concrete applications (e.g., sidewalks, pavements), the performance of RCA concrete in structural members and assemblies (e.g., beams, columns, frames) is not well known. The basic mechanical and time-dependent behavior of RCA concrete is complicated by the variability in the RCA material properties from different sources. Previous research has shown that this variability can be accounted for by using the RCA absorption and deleterious material content as predictors of the compressive strength, stiffness, creep, and shrinkage of RCA concrete. RCA has a more significant impact on the concrete deformations than on the compressive strength. Therefore, the understanding of the long-term deflection behavior of RCA concrete structures remains one of the primary obstacles against increased utilization in structural applications.

Lab Link

<https://engineering.nd.edu/profiles/ykurama>

Keith O’Connor: *“Predicting Microbial Community Shifts with Climate Change in Alaskan Soils”*



Significant biome shifts in northern latitudes will likely occur with climate change, altering plant species and diversity, beginning at the biome margin. Studies have also suggested that soil microbial communities are significantly affected by overall plant community diversity. However, there is significant uncertainty about how microbial biomass, activity, and population composition look today across biome borders. Molecular characterization of microbial communities within soils is an efficient means of determining bacteria and microfungus diversity and abundance. Chemotaxonomic markers, such as phospholipid fatty acids (PLFA) and phospholipid ether lipids (PLEL), can provide a profile of the microbial community. PLFAs and PLELs degrade within a few weeks after cell lysis and can thus be used as a proxy for the living microbial community of the sediments. These lipids have specificity for microbial families or groups. A complimentary technique using genetic sequencing (16S rRNA) can be compared to lipid results and used to identify specific communities and characterize their biogeochemical role in the soils. Utilizing these techniques, I aim to determine how microbial diversity across

biome boundaries in Alaska vary with vegetation. I focus on select modern biome margins, locations most susceptible to plant and microbial change. (Adviser: Dr. Melissa Berke)

Lab Links

<http://www3.nd.edu/~mberke/>

Facebook: <https://www.facebook.com/NotreDameOBGC>

After the success of our tailgate for the Nevada game, November's Academic Social Happy Hour event will be again coupled with a tailgate. This time for the football game against Virginia Tech on Saturday, November 19. Details coming soon.

If you have any suggestions, feedback, or constructive criticism regarding the Academic Social Happy Hour events, please contact any of the co-organizers: **Andrew Schranck, Theresa Aragon, Lara Grotz, and Stefanie Lewis**. We would love to hear from you.

GRADUATE STUDENT UNION UPDATE

In order to better serve the needs of the graduate students in the department, and to keep you up to date on the happenings within the Graduate Student Union, this new section of the newsletter will seek to provide you with a succinct overview of the most recent monthly council meeting, and give you the opportunity to voice your concerns through your department representative, **Andrew Schranck**. He serves on the Professional Development Committee, but can bring any pertinent issues related to graduate student life to the attention of any committee for you.

Each meeting's agenda may include guest speakers from within the university, updates from the various committee chairs (Academic Affairs, Health Care, Professional Development, Quality of Life, and Social), legislative proceedings, opportunities for representatives to voice concerns, and committee breakout sessions.

The meeting on October 13 included guest speakers who addressed graduate student housing to the extent of the fate of current on campus options and the efforts by the University to continue to support graduate students in this area. Let Andrew know if you have any questions or concerns relating to this matter. The next council meeting will be on Thursday, November 17.

GRADUATE STUDENT SPOTLIGHT



“The Moon is awesome,” says Karl, and that’s one reason he studies it here at Notre Dame under the guidance of Dr. Clive Neal. More specifically he studies KREEP basalts.

KREEP, named for the abundance of (K) Potassium Rare Earth Elements and Phosphorus, is rich in incompatible trace elements (elements that prefer to stay in the liquid and not crystalize as part of a mineral), and has been sampled by each sample return mission to the moon, but always as a component of some other rock, never undiluted. The least diluted KREEPy samples are the KREEP basalts. His work focuses on determining how these KREEP basalts came to be. Petrographic microscopes, electron microprobes, and laser ablation ICPMS are a few of the tools he uses to understand how

KREEP basalts formed.

A seasoned veteran in the department, he has presented posters and oral presentations of his research on KREEP basalts and VHK basalts at the Lunar and Planetary Science Conference. Currently, he has one paper in press that details the formation of KREEP basalt sample 15434,181, and he is working on three other manuscripts for publication. Currently, he is helping undergrads conduct their own research with Dr. Neal, which will hopefully be presented at the Lunar and Planetary Science Conference, while he finishes up his PhD.

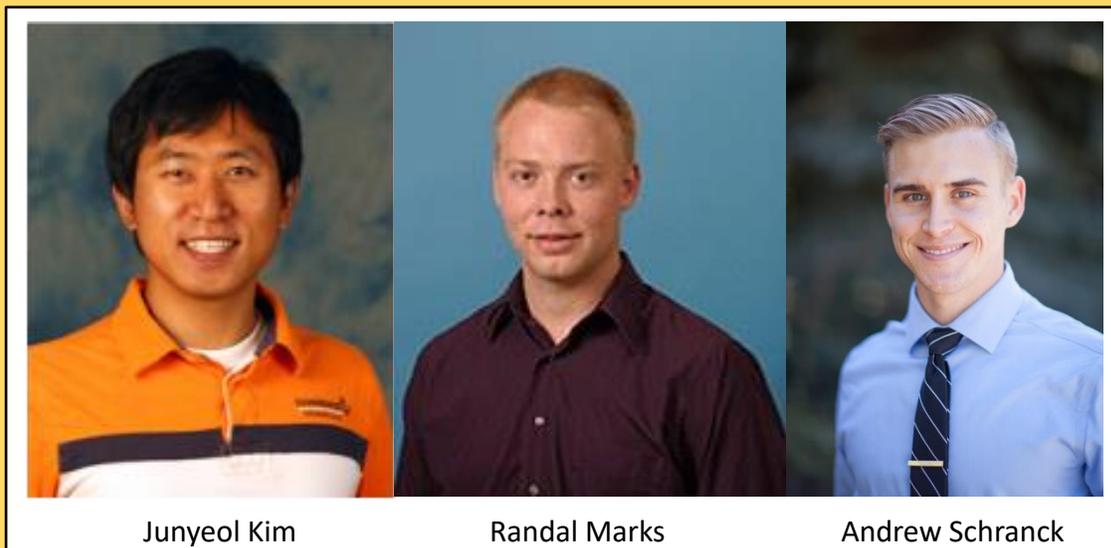
Lab Link

<https://engineering.nd.edu/profiles/cneal>

RESEARCH GROUP SPOTLIGHT

Dr. Kyle Doudrick – The Doudrick research group (Laboratory for Advanced and Sustainable Water Treatment) focuses on the development of sustainable water treatment technologies and the impact new and established technologies may have on human health and the environment. The group includes PhD students **Junyeol Kim** (second year), **Randal Marks** (third year), and **Andrew Schranck** (third year), as well as undergraduates Juan Velazquez, Brian Lee, David Clark, and Alicia Czarnecki. The group uses various techniques to synthesize, characterize, and employ nanomaterials for water treatment and environmental interaction studies. The lab relies on various valuable assets across campus including the Materials Characterization Facility (MCF) and the Center for Environmental Science and Technology (CEST).

Andrew is focused on using light-activated nanomaterial catalysts (photocatalysts) coupled with electrochemical systems and fuel cell technologies to treat organic contaminants in wastewater and produce electricity. Randal is focused on studying contaminants in drinking water, specifically oxoanions, and their interaction with the surface of heterogeneous photocatalysts during photocatalytic reduction processes. Junyeol is addressing fate and transport of engineered nanomaterials in the environment, specifically the interaction of protein coronas with living organisms and their impact on human health and the environment. The Doudrick lab as a whole is seeking to promote sustainable solutions which 1) have low energy cost such as those that are solar driven, 2) have minimal environmental impact such as readily abundant and benign, and 3) promote a positive impact on society such as ease of access and use.



More information on the Dr. Kyle Doudrick Research Group and a list of publications can be found at the following website: <http://www.doudrick.info/> and you can follow the lab on Twitter at twitter.com/kdoudrick

THE GRADUATE SCHOOL – SCHEDULE OF DEADLINES

	Fall 2016	Spring 2017	Summer 2017
Teaching assistant list submitted to Graduate School	Aug. 15	Jan. 5	—
First class day	Aug. 23	Jan. 17	—
All course changes	Aug. 30	Jan. 24	—
Initial graduation list available in GradAdmin (Registrar)	Sept. 6	Jan. 31	June 27
Fall/Spring break begins	Oct. 15	Mar. 11	—
Course discontinuance	Oct. 28	Mar. 24	—
Preliminary theses/dissertations submitted for formatting check*	Nov. 7	Mar. 13	Jun. 19
Thanksgiving break begins (Wed. – Sun.)	Nov. 23	—	—
Easter break begins (Fri. – Mon.)	—	Apr. 14	—
Master's comprehensive examinations & PhD dissertation defenses**	Nov. 28	Apr. 7	Jul. 11
All admission to candidacy forms submitted to Graduate School	Dec. 5	Apr. 13	Jul. 17
Final theses/dissertations submitted to Graduate School	Dec. 5	Apr. 13	Jul. 17
Last class day	Dec. 8	May 3	Jul. 28
Final exams begin	Dec. 12	May 8	—
Graduation date (official degree conferral)	Jan. 8	May 20	Aug. 6

FELLOWSHIP/SCHOLARSHIP/EMPLOYMENT OPPORTUNITIES

- **National Defense Science and Engineering Fellowship (NDSEG)** (Deadline: December 9)

https://ndseg.asee.org/about_ndseg/eligibility

- **NASA Space Technology Research Fellowship (NSTRF)** (Deadline: November)

<https://nspires.nasaprs.com/external/>

- **Harriet Evelyn Wallace Scholarship**

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

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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