FROM THE EDITORS

Well, April is upon us and with it the end of winter (hopefully). While we still have to endure the April showers to reach the May flowers, it feels like summer is around the corner. Those in classes this semester can look forward to the frantic end of the semester rush of projects, reports and exams. Additionally, a slew of students get to look forward to defending their dissertation/thesis or taking their oral candidacy exam this month. Good luck to everyone who has these important deadlines approaching! Keep up the hard work and hopefully we can all reap the benefits by taking some time in the summer to enjoy the weather.
ANNOUNCEMENTS

Congratulations

Brooke Stemple was recently awarded an Honorable Mention for her application to the NSF’s Graduate Research Fellowship Program (GRFP). Her research proposal was titled “Engineering a Highly Specific and Recyclable Biological Phosphate Scavenger for Phosphorus Recovery from Waste Streams.” This is a prestigious honor as this is one of the most competitive and well respected fellowship programs in the country across all science and engineering disciplines.

Junyeol Kim was recently awarded a grant from ND-LEEF to work on “Stream Transport Behavior of Food-Grade Titanium Dioxide Nanoparticles in a Hydraulically Controlled, Model System”.

Structural Engineering Institute (SEI) Notre Dame Graduate Student Chapter

The SEI-ND Graduate Student Chapter was approved by both Notre Dame and SEI! More information will be forthcoming, but a bare-bones website is up: www.nd.edu/~seind

Conferences

Students in the Neal group attended the Lunar and Planetary Science Conference (LPSC) and gave the following oral presentations:

“Moderately Volatile Element Content of Apollo 17 Soil Sample 74220”
David Burney

“Ferroan Anorthosite 60025: Magma Ocean Product – and More!”
Mike Torcivia

As well as the following poster presentations:

“Quantifying Moderately Volatile Elements in Mare Basalts: Application of the Method”
David Burney

"How do KREEP Basalts form? Evidence from 14160,214"
Karl Cronberger

"Positive Europium Anomalies in Pyroxenes in Ferroan Anorthosite 60025: Implications for FAN Ages"
Mike Torcivia

Meanwhile, students in the Burns and Hixon groups gave the following presentations at the Spring ACS meeting:
“Dissolution of uranium minerals in uranyl peroxide nanocluster forming environments”
Haylie Lobeck

“Structural stability of uranyl nanoclusters”
Melika Sharifironizi

“Sorption mechanism and kinetics of the uranyl peroxide nanocluster (U60) to Ca- and Na-montmorillonite”
Luke Sadergaski

“Influence of alkali metals in dissolving UO2 to form highly soluble aqueous uranyl peroxide clusters”
Sarah Hickam

“Thermochemistry of neptunium oxides and Np incorporated studtite”
Lei Zhang

Nicole Moore

Andrew Bartolini attended the ASCE Structures Congress and gave the following presentations:

“A Predictive Model for Damping in Tall Buildings Based on Structural System Behavior”

“Capturing the Total Displacement of Tall Buildings: Use of Tiltmeters in Full-Scale Monitoring Arrays”

In addition, Mike Brandes and Theresa Aragon had presentations/posters accepted and Karen Angeles was an author on a presentation at the ASCE Structures Congress.

Academic Social Happy Hour

The CEEES Graduate Student Organization (GSO) gathered for the monthly research and social event with a superb presentation from Monica Arul on her structural engineering research into tall buildings and machine learning. See her abstract below. The presentation was held in the usual spot, Cushing 217. Afterwards everyone walked and talked their way over to Legends of Notre Dame to celebrate St. Patrick’s Day and enjoy more conversation with appetizers and drinks. For the month of April, presentations will be delivered during the week and a weekend picnic is in the works for Saturday, April 29 from 11:30-2:00 pm at Pinhook Park, so mark your calendars and RSVP. Students are invited to bring friends, spouses, and children.
Monica Arul: “Full-scale data assessment of a tall building: A machine learning approach”

There has been a steady increase in the number of tall buildings in the world. Most of the tall buildings are vulnerable to wind-induced motion due to their increasing heights, slender design and use of lightweight materials. This has led to structural health monitoring of tall buildings to validate the design assumptions. Continuous monitoring generates a large volume of data and mining this rich database will reveal salient information about the building’s behavior. The usual ‘physics-based’ model of the structure (Finite Element Model) needs a detailed description of the system and is very difficult to build an accurate model. On the other hand, a ‘data-based’ approach helps in overcoming most of the disadvantages of the law-based model.

My current research uses the full-scale data obtained from the tall building monitoring system named “SmartSync” developed by Dr. Kareem, Dr. Kijewski-Correa and Dr. Kwon. I use data mining and machine learning techniques on the full-scale dataset. These techniques have the potential to reveal relationship between structural response, dynamic properties, excitation and other environmental conditions rather than limiting analysis to conventional relationship assumed a priori by researchers. In doing so, the power of data can be utilized effectively to reflect how the structure reacts to a variety of environmental conditions.

Lab Link: [http://www3.nd.edu/~nathaz/](http://www3.nd.edu/~nathaz/)

If you have any particular questions or concerns regarding the academic social events, please contact any of the organizers: Andrew Schranck ([aschranc@nd.edu](mailto:aschranc@nd.edu)), Theresa Aragon ([aragon.10@nd.edu](mailto:aragon.10@nd.edu)), Lara Grotz ([sisman.1@nd.edu](mailto:sisman.1@nd.edu)), and Stefanie Lewis ([Lewis.184@nd.edu](mailto:lewis.184@nd.edu)). They would love to hear from you.
GRADUATE STUDENT SPOTLIGHT

I’m a 4th year PhD candidate studying in Josh Shrout’s lab. The Shrout lab, in general, studies how bacteria move to colonize surfaces. Many bacteria can grow on and colonize surfaces, including those that cause disease or those that degrade pollutants, so understanding the mechanisms controlling motility can lead us to better management techniques. My work focuses on the environmentally pervasive opportunistic pathogen *Pseudomonas aeruginosa* and how it moves via swarming (i.e. coordinated bacterial motility through a thin liquid layer on a surface, which serves as a way to colonize said surface before attachment and biofilm formation).

My research addresses how environmental factors affect *P. aeruginosa* swarming. I’m investigating biosurfactant-independent swarming, how it is connected to differences in nutritional growth media (especially carbon sources), and what effect non-antibiotic pharmaceutical contaminants (like caffeine or ibuprofen) may have on surface motility.

I’ve presented my work at a number of conferences, including most recently in January at the 2017 Bacterial Locomotion and Signal Transduction meeting in New Orleans. One of my swarming images was also used as the cover photo of the February 2017 issue of the journal *Microbial Cell*. I’m working on a couple of manuscripts right now, and I’m just hoping my bacteria cooperate long enough for me to finish my degree in the next year or so.

When I’m not making swarm assays or trying to write, you can usually find me either singing alto with the University of Notre Dame Folk Choir or swimming at Rolfs with the Irish Masters swim team.

For more cool pictures and videos of bacteria moving, check out our lab website: [http://www3.nd.edu/~jshrout/](http://www3.nd.edu/~jshrout/)

*Figure 1*: Close-up photo of the pattern within the swarm of a biosurfactant-deficient *P. aeruginosa* strain.

*Figure 2*: A *P. aeruginosa* mutant called A12c forms fine tendrils when swarming on glutamate.
Graduate Student Union Update

The March meeting brought Erik Oswald from Graduate Career Services to share about all things related to grad career services. He introduced the new website recently rolled out, and then conducted a focus group of sorts to learn more about how graduate students would like to interact with Graduate Career Services on social media. You should check out the website at: (https://gradcareers.nd.edu/). A great place to start on the website is Career Resources under the heading For Graduate Students on the right side of the page. There is loads of information about professional development and career planning there.

If you are interested in representing the CEEES department as a representative in the Graduate Student Union for the 2017-18 academic year, please contact Mollie Dash (dash.1@nd.edu) or Andrew Schranck (aschranc@nd.edu) for more information before finals week.

The 3MT competition Finals were held March 27, 2017. Check out presentations of all the finalist here: (http://3mt.nd.edu/meet-the-finalists/)

The GSU Social Committee is sponsoring several events coming up including the Charity Gala April 22, and winery tour April 30. Tickets are required and more information can be acquired here (http://gsu.nd.edu/social/gsuevents/).

The next council meeting is Thursday, April 20 at 6:30 pm in the LaFortune Student Center Room 202. Please let Andrew Schranck (aschranc@nd.edu) know if you have any concerns or feedback pertaining to graduate student government.

Don't forget, all graduate students can receive conference funding once per year from the GSU based on a competitive application process. See the Conference Presentation Grants website (http://gsu.nd.edu/about/cpg/) for more details.
RESEARCH GROUP SPOTLIGHT

George P. Mavroeidis Group — The Mavroeidis research group includes PhD students Yenan Cao (fourth year), Shuo Yang (third year), and visiting PhD student Yang Ding (fourth year).

Yenan Cao                              Shuo Yang                               Yang Ding

The group focuses on the areas of engineering seismology, earthquake engineering and structural dynamics, and includes topics related to mechanics and physics of earthquakes, characterization of earthquake ground motions, deterministic and stochastic ground motion simulations, fracture and frictional processes, seismic hazard and risk analysis, soil-structure interaction, computational modeling, and dynamic response of engineering structures.

Yenan’s research focuses on investigating the effects of near-fault ground strains and rotations on the response of engineering structures. His work is based on an interdisciplinary approach that ranges from the description of the earthquake source, to ground motion modeling, and to dynamic structural response. He currently works on utilizing physics-based simulation techniques to enhance the characterization, modeling, and simulation of near-fault ground strains and rotations. Shuo Yang’s research focuses on essential spatially extended structures, (e.g., bridges) crossing active tectonic faults in earthquake-prone regions around the world. By understanding the behavior of bridges crossing fault rupture zones and identifying the key parameters that may affect the bridges, a simplified analysis method has been developed for bridges crossing fault rupture zones which will facilitate a rational seismic design philosophy to be established. In addition, some risk mitigation strategies for fault-crossing bridges will be proposed for designers.

Lab Link

http://www3.nd.edu/~gmavroei/
<table>
<thead>
<tr>
<th>Event</th>
<th>Fall 2016</th>
<th>Spring 2017</th>
<th>Summer 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching assistant list submitted to Graduate School</td>
<td>Aug. 15</td>
<td>Jan. 5</td>
<td>—</td>
</tr>
<tr>
<td>First class day</td>
<td>Aug. 23</td>
<td>Jan. 17</td>
<td>—</td>
</tr>
<tr>
<td>All course changes</td>
<td>Aug. 30</td>
<td>Jan. 24</td>
<td>—</td>
</tr>
<tr>
<td>Initial graduation list available in GradAdmin (Registrar)</td>
<td>Sept. 6</td>
<td>Jan. 31</td>
<td>June 27</td>
</tr>
<tr>
<td>Fall/Spring break begins</td>
<td>Oct. 15</td>
<td>Mar. 11</td>
<td>—</td>
</tr>
<tr>
<td>Course discontinuance</td>
<td>Oct. 28</td>
<td>Mar. 24</td>
<td>—</td>
</tr>
<tr>
<td>Preliminary theses/dissertations submitted for formatting check*</td>
<td>Nov. 7</td>
<td>Mar. 13</td>
<td>Jun. 19</td>
</tr>
<tr>
<td>Thanksgiving break begins (Wed. – Sun.)</td>
<td>Nov. 23</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Easter break begins (Fri. – Mon.)</td>
<td>—</td>
<td>Apr. 14</td>
<td>—</td>
</tr>
<tr>
<td>Master’s comprehensive examinations &amp; PhD dissertation defenses*</td>
<td>Nov. 28</td>
<td>Apr. 7</td>
<td>Jul. 11</td>
</tr>
<tr>
<td>All admission to candidacy forms submitted to Graduate School</td>
<td>Dec. 5</td>
<td>Apr. 13</td>
<td>Jul. 17</td>
</tr>
<tr>
<td>Final theses/dissertations submitted to Graduate School</td>
<td>Dec. 5</td>
<td>Apr. 13</td>
<td>Jul. 17</td>
</tr>
<tr>
<td>Last class day</td>
<td>Dec. 8</td>
<td>May 3</td>
<td>Jul. 28</td>
</tr>
<tr>
<td>Final exams begin</td>
<td>Dec. 12</td>
<td>May 8</td>
<td>—</td>
</tr>
<tr>
<td>Graduation date (official degree conferral)</td>
<td>Jan. 8</td>
<td>May 20</td>
<td>Aug. 5</td>
</tr>
</tbody>
</table>
FELLOWSHIP/SCHOLARSHIP/EMPLOYMENT OPPORTUNITIES

- Graduate Student Union Conference Presentation Grants (Rolling basis)  
  (http://gsu.nd.edu/about/cpg/)

- Graduate School Professional Development Awards (Rolling basis)  
  (http://graduateschool.nd.edu/professional_development/professional-development-award-application/)

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:

Ryan Alberdi, PhD candidate, Ryan.A.Alberdi.1@nd.edu  
David Burney, PhD candidate, David.C.Burney.2@nd.edu  
Andrew Schranck, PhD candidate, Andrew.F.Schranck.1@nd.edu  
Meenu Garg, Graduate Program and Web Coordinator, mgarg@nd.edu