DGS’ DESK

Here we are in the month of August and with it comes the start of a new academic year! Where did the summer go? Like most of you, I had so many items to complete on my “to do” list……oh well……

CEEES is proud to welcome 23 new graduate students to our department! Please join me in extending them a warm welcome, and help them get familiar and comfortable in their new home.

I’m very happy to report that Andrew Schranck and Theresa Aragon have been busy organizing the first Academic Social Happy Hour for this year, which will take place on Thursday, August 25th. If you wish to get involved and participate in planning and organizing this monthly social event for CEEES graduate students in the future, then I’m sure Theresa and Andrew will appreciate and welcome the much needed help!

Lastly, I wish to report that beginning with this issue, the CEEES graduate student newsletter is entirely being organized and put together by the graduate student editorial staff, which consists of Ryan Alberdi, David Burney, and Andrew Schranck. Therefore, please send news, announcements, successes, and other newsworthy happenings to one of the three editors or Mollie Dash.

Wishing everyone a fantastic start to the Fall semester and academic year of 2016.

Tony Simonetti
ANNOUNCEMENTS

Patrick Conry attended the 17th International Conference on Harmonisation within Atmospheric Dispersion Modeling for Regulatory Purposes (HARMO17) in Budapest, Hungary from May 9-12 where he gave a presentation titled *Dry Deposition onto Vertical Surfaces in the Urban Environment*.

Ryan Alberdi, Guodong Zhang, Lei Li, Jize Zhang and Yao Wang all attended the joint Engineering Mechanics Institute (EMI) and Probabilistic Mechanics & Reliability (PMC) Conference 2016 in Nashville, Tennessee from May 22-25. They gave the following presentations:

- **Ryan Alberdi**: *Length Scale Effect on Wave Propagation in Periodic Micro-Lattices*
- **Guodong Zhang**: *Analysis of Three-Dimensional Curved Beams Using Isogeometric Approach*
- **Lei Li**: *Topology Optimization of Geometrically Nonlinear Trusses with Critical Load Constraint*
- **Jize Zhang**: *Adaptive Kriging Metamodeling for Simultaneous Uncertainty-Propagation and Design-Optimization*
- **Yao Wang**: *Optimization of Geometric Parameters of an Adjustable Module for Variable Depth Arch Bridges*

Andrew Schranck attended the International Water Association’s (IWA) Leading Edge Technology (LET) Conference in Jerez de la Frontera, Spain from June 13-16 where he presented his poster entitled *Sustainable treatment of wastewater and generation of electricity using a solar photocatalytic fuel cell*.

Alejandra Cartagena-Sierra attended the two week long IsoCamp 2016 where she and other grad students got trained in the fundamentals of stable isotopes in ecology. This course took place at the University of Utah in June.

Structural Engineering Institute (SEI) Notre Dame Campus Chapter is coming soon. SEI is a branch of the American Society of Civil Engineers, which is the national governing body. It won't be anything lavish as the group doesn't have much if any funding, but it will serve as access to the professional organization. Questions about the group can be directed to Andrew Bartolini (abartoli@nd.edu).

**Academic Social Happy Hour**

Over the summer months, we took advantage of the beautiful weather and gathered at Pinhook Park in South Bend for food, refreshments, and fellowship after our regularly scheduled research talks in Cushing Hall 217.

**Andrew Schranck, Theresa Aragon** (co-organizers)
Elise Wright (PhD candidate): “Incomplete mixing of reactive transport in heterogeneous porous media”

Mixing is the process that brings reactive solutes together. Given two reactant species, their ability to react with each other is dependent on whether or not they collocate. As a result, mixing plays an important role in driving reactions. Incomplete mixing in reactive transport causes the reactant species to segregate from one another and form “islands,” therefore limiting the amount of reaction that takes place. It is important to be able to understand and describe the effects of incomplete mixing in order to accurately model reactive transport. This problem has been previously examined in purely diffusive systems, and, most recently, in a pure shear flow. The next step in addressing the issue of incomplete mixing is to explore the mixing processes in systems with more general non-uniform velocity fields, such as those describing flow through a heterogeneous porous medium. This is the problem I will discuss here. (Adviser: Dr. David Richter)

Lab Links

http://www3.nd.edu/~drichte2/

Lei Li (PhD candidate): “Topology optimization of linear and nonlinear structural systems”

Topology optimization technique has found a large number of applications in early conceptual and preliminary design phases where design changes significantly impact the performance of the final structure. However, most research related to topology optimization has been concerned with linear problems, like linear elasticity. My research interests are in the areas of computational mechanics and multidisciplinary design topology optimization, with a particular focus on problems involving complex, nonlinear structures. In this talk, I will give a brief summary of my current and future work. (Adviser: Dr. Kapil Khandelwal)

Lab Links

http://www3.nd.edu/~cpssl/
Presenters for Friday, July 21, 2016:

Alejandra Cartagena-Sierra (PhD candidate): “Multiproxy reconstruction of sea surface temperature in the Agulhas Corridor and implications for plio-pleistocene climate

Organic biogeochemistry provides ways to reconstruct paleoenvironmental conditions allowing for a better understanding of how ecosystems responded to past climactic variations. Organic molecules are preserved in sediments or soils as biological markers, “biomarkers”. These can be analyzed and quantified to offer information about how the surrounding environment was when the molecules were synthesized. I am particularly captivated by the potential that some biomarkers have to reconstruct past water temperatures. My current research involves reconstructing the temperature of the uppermost water column in the Southwestern Indian Ocean during the critical Mid-Pleistocene Transition (1.2–0.5 million years ago). I aim to analyze sediments collected during the IODP Expedition 361 using organic biogeochemical proxies. This study will provide insights into how fluctuations in the dynamics of the Agulhas system relates with the variability of the Atlantic Ocean circulation and global climate during the Mid-Pleistocene Epoch. (Adviser: Dr. Melissa Berke)

Lab Links

http://www3.nd.edu/~mberke/index.html
https://www.facebook.com/NotreDameOBGC
Randy Marks (PhD candidate): “In situ monitoring of photocatalytic reduction processes using ATR-FTIR”

My research focus is on the interaction of drinking water contaminant oxoanions with the surface of heterogeneous photocatalysts before and during the photocatalytic reduction process. Oxoanions are negatively charge ions (including nitrate, nitrite, chlorate, chlorite, perchlorate, and bromate) that are commonly present in potential drinking water sources. Photocatalysis by nano-structured photocatalysts can drive the reduction of these contaminants to inert by-products using solar energy. However, the mechanistic steps in this process are not fully understood. I am using techniques such as ATR-FTIR to monitor the interactions of these oxoanions at the surface of the photocatalyst during various stages in the photocatalytic process, including sorption, reduction and desorption. In situ monitoring of the reaction can be used in tandem with analytical techniques such as ion chromatography, zeta potential analysis and x-ray diffraction to characterize sorption processes, intermediate formation and mechanistic pathways during the photocatalytic process. Outcomes of this research will help optimize photocatalyst properties and reaction conditions to drive effective photocatalysis. (Adviser: Kyle Doudrick)

Lab Links

http://www.doudrick.info/
NEW STUDENTS

We would like to welcome all of the new graduate students starting in the 2016-2017 academic year to the CEEES department!

Karen Angeles
Adviser: Tracy Kijewski-Correa

Margaret Butzen
Adviser: Jeremy Fein

Foteini Dimakopoulou
Adviser: Peter Burns
Lara Grotz
Adviser: Robert Nerenberg

Liang Hu
Adviser: Ahsan Kareem

Stefanie Lewis
Adviser: Antonio Simonetti
Chinedu Madukoma
Adviser: Joshua Shrout

Nicole Moore
Adviser: Amy Hixon

Duy Nguyen
Adviser: David Richter
Sebastian Otarola-Bustos
Adviser: David Richter

Dimitrios Patsialis
Adviser: Alex Taflanidis

Jaynise Perez
Adviser: Joannes Westerink
Sam Perry  
Adviser: Peter Burns

Hector Rivera  
Adviser: Antonio Simonetti

Meena Said  
Adviser: Amy Hixon and Peter Burns
Thomas Sherman
Adviser: Harindra Fernando

Numan Sirin
Adviser: Harindra Fernando

Brooke Stemple
Adviser: Na Wei
Michael Torcivia
Adviser: Clive Neal

Daniel Vassallo
Adviser: Harindra Fernando

Marcela Vega-Munoz
Adviser: Robert Nerenberg
Ying Wu
Adviser: Na Wei

Baotong Zhu
Adviser: Na Wei
THE GRADUATE SCHOOL – SCHEDULE OF DEADLINES

<table>
<thead>
<tr>
<th>Event</th>
<th>Fall 2016</th>
<th>Spring 2017</th>
<th>Summer 2017</th>
</tr>
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<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>
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<tr>
<td>Initial graduation list available in GradAdmin (Registrar)</td>
<td>Sept. 6</td>
<td>Jan. 31</td>
<td>June 27</td>
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<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>
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<tr>
<td>Preliminary theses/dissertations submitted for formatting check*</td>
<td>Nov. 7</td>
<td>Mar. 13</td>
<td>Jun. 19</td>
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<tr>
<td>Thanksgiving break begins (Wed. – Sun.)</td>
<td>Nov. 23</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Easter break begins (Fri. – Mon.)</td>
<td>—</td>
<td>Apr. 14</td>
<td>—</td>
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<tr>
<td>Master’s comprehensive examinations &amp; PhD dissertation defenses**</td>
<td>Nov. 28</td>
<td>Apr. 7</td>
<td>Jul. 11</td>
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<tr>
<td>All admission to candidacy forms submitted to Graduate School</td>
<td>Dec. 5</td>
<td>Apr. 13</td>
<td>Jul. 17</td>
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<tr>
<td>Final theses/dissertations submitted to Graduate School</td>
<td>Dec. 5</td>
<td>Apr. 13</td>
<td>Jul. 17</td>
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<tr>
<td>Last class day</td>
<td>Dec. 8</td>
<td>May 3</td>
<td>Jul. 28</td>
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<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. 6</td>
</tr>
</tbody>
</table>

FELLOWSHIP/SCHOLARSHIP/EMPLOYMENT OPPORTUNITIES

- National Defense Science and Engineering Fellowship (NDSEG)
  [https://ndseg.asee.org/about_ndseg/eligibility](https://ndseg.asee.org/about_ndseg/eligibility)

- National Science Foundation (NSF) Graduate Research Fellowship (GRF) ([Deadline: October](http://www.nsf.gov/pubs/2016/nsf16588/nsf16588.pdf))

- 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

- The Smithsonian Institution Fellowship Program (Deadline: September 1)
  http://www.smithsonianofi.com/fellowship-opportunities/smithsonian-institution-fellowship-program/

- O.H. Ammann Research Fellowship (Deadline: November 1)
  http://ektronstaging.asce.org/structural-engineering/ammann-research-fellowship/?ga=1.54203821.467554197.1471637048

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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Andrew Schranck, PhD candidate, aschranc@nd.edu
Mollie Dash, Department Administrator, dash.1@nd.edu