



The WILLIAM STATES LEE COLLEGE of ENGINEERING

CEE News

CIVIL & ENVIRONMENTAL ENGINEERING Department

LETTER FROM CEE Department Chair



If you are a regular reader of this newsletter, you may have noticed a new smiling face here on the front page. Not John Daniels, but me as the Interim Chair of the Department since January 2017. John has temporarily vacated the Chair position to focus on other projects such as the National Ash Management Advisory Board (NAMAB), an independent panel of experts that he has assembled and chairs that provides objective technical and policy advice

on a range of issues related to coal ash management, disposal, and reuse. We look forward to John's return to UNC Charlotte on a full-time basis.

The academic year that just completed was truly something special. In two graduation ceremonies (December 2016 and May 2017), a total of 96 students received Bachelor's Degrees this past academic year. I will not soon forget that happy day in May when I for the first time had the pleasure of greeting and lining up our undergraduates prior to the ceremony. Just a few weeks prior to graduation we had our first Department-based undergraduate student awards ceremony, formally recognizing the excellent work of our students. Much of this newsletter tells stories of their excellent work throughout the year.

Also in this issue are stories of new research centers and new faculty awards to conduct important energy infrastructure research. Our

faculty collectively set a Departmental record for new research awards this fiscal year, and we lead the College in new research funding per faculty. All in all it was a very successful year.

No single event this past year occupied more time and effort than the Carolinas Conference that we collectively hosted on and around campus during the first weekend of April. Our students did the vast majority of the work, but there were indispensable contributions made as well by faculty, staff, and alumni. Together, they did an amazing job to create and execute an event that had equal parts fun, meticulous organization, and good-natured, spirited competition. More than 350 students from 10 schools left with a new-found appreciation of the excellence of our students, our Department, and our University. Our students' work this year brings to my mind a keepsake that I have from my father's office. He was a career Naval officer who had always on his desk a small wooden plaque given to him early in his career by an Admiral for whom he worked as an aide. The plaque reads "Nothing is impossible to the man who does not have to do it himself." These days we would modify the masculine pronoun, but the message is as true today as it was more than 50 years when I first read it as a child. Working together we can do amazing things!

If you've got stories of amazing things done by alumni, students, or faculty, please stop by my office and tell me the tale. I'll show you my father's plaque!

James D. Bowen
Professor and Acting CEE Department Chair

CEE @ A GLANCE

UNDERGRADS:

413

UPDATED: APRIL 2017

DOCTORAL STUDENTS:

55

MASTERS STUDENTS:

51

FACULTY MEMBERS:

25



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CEE RESEARCH NOTES

ASCE STUDENT CHAPTER: The 2017 Carolinas Conference was **EPIC**

THE HIGHLIGHTS



The UNC Charlotte Student Chapter hosted the ASCE Carolinas Conference on March 31 and April 1, 2017. The theme, **THINK EPIC**, permeated all the events which took place both on campus and in the surrounding areas of Mecklenberg County. More than 350 civil and environmental students from 12 schools participated, including two international teams.

Events included the various competitions (listed below), an alumni-faculty social, a career expo which included many of the corporate sponsors, and an awards banquet with **Dr. Pat Galloway**, the first woman ASCE President, as keynote speaker. The Career Expo was a Carolinas Conference first.

COMPETITIONS INCLUDED

Concrete canoe	Transportation	Geotechnical engineering	Environmental engineering
Steel bridge	Concrete bat	Freshmore challenge	Hydraulic and fluid mechanics
Surveying	Structural engineering	Quiz Bowl	T-shirt design

CEE Senior **Darin Basso**, student chairperson of the conference committee was pleased with the outcome of the conference. "We delivered a very solid conference," he said. "I am proud that we got the entire department, numerous alumni, and a tremendous amount of students to put this all together." ♦

CAROLINAS CONFERENCE Results

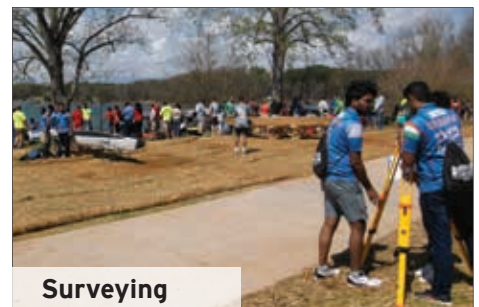


Overall Steel Bridge:

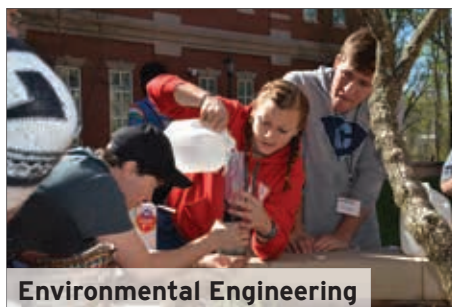
2nd Place: NC State University
1st Place: Georgia Tech

Overall Concrete Canoe:

3rd Place: UNC Charlotte
2nd Place: Clemson
1st Place: Citadel



Surveying



Environmental Engineering

Overall winners:

3rd Place: Georgia Tech
2nd Place: UNC Charlotte
1st Place: Citadel

EPIC Results

UNC Charlotte Placed in the Top 3 in 7 of the Competitions.

UNC Charlotte's Trophies:

- 3rd Place for the Final Product portion in Concrete Canoe Competition
- 3rd Place for the Design Paper portion in Concrete Canoe Competition
- 3rd Place in the Transportation Competition
- 2nd Place in the Surveying Competition
- 1st Place in the Geotech Competition
- 1st Place in the Hydraulics Competition
- 1st Place in the Quiz Bowl Competition
- 1st Place in the Concrete Bat Competition



UNC CHARLOTTE 2017 Carolinas Conference Committee:
Seth Cathey, Kurrisa Violet, Adam Howe, Sophie Benoit, Taylor Smith, Darin Basso, Anna Salas, Dr. Janos Gergely, Jorge Garcia, Corey Rice

AN ASCE Canoe Story: PART 1: A "HEAVY" TRADITION (AND RIVALRY)

The tradition of the ASCE concrete canoe race started in the 1960s, according to ASCE.org. No one really knows why this small group of student chapters began holding intramural concrete canoe races, but no one seems to care anymore.

Michigan State University was the first to host the ASCE National Concrete Canoe Competition (1988). Since its beginning, a long list of both U.S. and international schools have hoisted the winner's trophy for the event.

The National Concrete Canoe Competition has its own Facebook page. Design drawings and concrete recipes are swapped freely there—as well as a little trash talking. Rumor has it that some teams hire special row teams and rowing coaches to gain a competitive edge in the nationals.

The ASCE-approved list of competitors for the 2017 National 'Games' consists of 60 schools. Two are from Mexico and one is from Canada. First, second, and third place winning schools get scholarship money and a trophy.

Unfortunately, UNC Charlotte's team won't compete in nationals this year. Judges called off the race at the Carolinas Conference this March because of high winds and waves on race day.

Continued on page 6



UNC CHARLOTTE 2017 Canoe Team Members:

Left side of canoe (Back to front)

Joseph Lounsbury, Kyle Indingaro, Aaron Butler, Alex Tax, Bryce Cox, Savannah Green, Donald Penson, Megan Turnbull, Skylar Greer, Brittany Hause, Michele Rudd

Right side of canoe (Back to front)

Troy Majewski, David Smith, Matthew Dinsmore, John Medina, Dawn Salley, Sean McFee

Source: ASCE.org



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Follow Us:

http://Twitter.com/UNCC_CEE

CEE ALUMNI SPOTLIGHTS: Grads Touching Lives

Kurt Wright, P.E. (BSCE, 1977)



CEE Alumnus, **Kurt Wright** was admitted to UNC Charlotte in the Fall of 1973. Back then the program was known as Urban and Environmental Engineering. He has fond memories of taking thermodynamics under former College of Engineering (COE) Dean Bob Snyder and hanging out with his fellow 30 classmates in Smith Hall (the only engineering building at that time).

After graduation in 1977, Kurt got married and spent a year at Capernwray Bible School in England, as preparation for faith missions work abroad. In 1978, his life took another turn, though. He was offered a position with a U.S. engineering firm. He stayed with that firm, now called LaBella Associates, until 1987. While there he earned his P.E. certification.

Between working with engineering firms in Charlotte and Pittsburgh, Kurt's career took many major turns over the years that followed. After over 20 years and three different employers, he felt led to leave the corporate world. Setting his eyes on the next phase of his life, Kurt built a house for his family of 12 in Rutherford County, NC, about 80 miles west of Independence High School where he first dreamed of becoming an engineer.

In 2002, Kurt started his own company, Kurt D. Wright & Associates, Inc., which specialized in water and wastewater engineering. Then in 2012, he changed the name of the firm to SDG Engineering, Inc., which means *solī deo gloria* or "to the glory of God alone" in Latin. The composer Johann Sebastian Bach inscribed his sacred and secular manuscripts with the initials 'sdg' signifying that God should be given credit for every good thing. This is Kurt's credo as well.

When his schedule allows, Kurt accepts speaking engagements to share about his experiences as an engineer and entrepreneur. He spoke at ENGR 3295, COE's Multidisciplinary Professional Development class this past March.

His son Daniel may follow in his father's footsteps. He is currently a CEE freshman. Read more about SDG at <http://www.sdgengineering.us/experience>. To volunteer as a ENGR 3295 guest speaker, contact Ms. Linda Thurman at lthurman@uncc.edu or 704-687-5024. ♦

Will Allen, E.I. (BSCE, 2015)



Last May, wildfires caused \$3.6 billion* in damages near Fort McMurray, Alberta, Canada. CEE graduate **Will Allen** was part of the GHD Consulting Services crew dispatched to help repair the damaged infrastructure.

Will, a water/wastewater engineer out of GHD's Charlotte office, worked on a +\$1,000,000 emergency water main repair near the completely burned Stoneycreek neighborhood in Fort McMurray.

GHD (<http://www.ghd.com/usa>) provides engineering, architecture, environmental and construction services to private and public sector clients. ♦



GHD Crew near "Ft. Mac" installing a vault with a crane

* Insurance Bureau of Canada estimate

ALUMNI: Share Your News

Please send us news of your latest accomplishments, awards, or recognition.

Email your announcement to the department at cee.dept@uncc.edu.

Be sure to include your: Name, mailing address (if updated), company name, degree, major and class.

Please follow us on Twitter ... @UNCC_CEE | Like us on <http://Facebook.com/UNCCCharlotteCEE>

And join the "UNC Charlotte Civil & Environmental Engineering Alumni" group on [LinkedIn.com](https://www.linkedin.com/groups/11111111)

NEW YEAR, New Look

Do you like our new look? Tell us about it. Email or call: jdbowen@uncc.edu, 704-687-1215

SPOTLIGHTED Journal Papers & Textbooks

Dr. Wei Fan and his students attended the 96th Annual Meeting of the Transportation Research Board. Two papers were presented as posters: 1. Gong, L. and Fan, W., Applying Travel Time Reliability Measures in Identifying and Ranking Recurrent Freeway Bottlenecks at Network Level, The 96th Annual Meeting of the Transportation Research Board, January 8-12, 2017, Washington, DC.; 2. Gong, L. and Fan, W., Modeling Single Vehicle Run-Off-Road Crash Severity in Rural Areas: A Mixed Logit Model Approach, The 96th Annual Meeting of the Transportation Research Board, January 8-12, 2017, Washington, DC.

Dr. Fan also published a textbook with three other co-authors: Guo, T.Y., Shao, F., Zhao, H.J. and Fan, W., Level of Service of Safety at Freeway Exits: Theory and Methods, Hohai University Press, P.R.China, 2016.

Dr. Fan and his student also attended the SDITE 2017 Annual Meeting. One paper was presented as a poster: Gong, L. and Fan, W. Characterizing Freeway Bottlenecks Using Vehicle Probe Data, SDITE Annual Meeting, March 26-29, 2017.

Dr. Fan published five new papers in 2017: 1. Gong, L. and Fan, W., Modeling Single Vehicle Run-Off-Road Crash Severity in Rural Areas: A Mixed Logit Model Approach, Accident Analysis and Prevention, Vol. 101, pp. 124-134, 2017; 2. Fan, W., Social Welfare Maximization by Optimal Toll Design for Congestion Management: Models and Comprehensive Numerical Results, Transportation Letters: the International Journal of Transportation Research, Volume 9, Issue 2, pp. 81-89, 2017; 3. Yu, M. and Fan, W., Calibration of Microscopic Traffic Simulation Models Using Metaheuristic Algorithms, Accepted for Publication in International Journal of Transportation Science and Technology, May, 2017; 4. Zhang, H.H., Fan, W., Liao, Z.H. and Yang, L., Impacts of Parallel Runway Operation Modes on Air Traffic Flow Characteristics in Terminal Areas, Accepted for Publication in Journal of Transportation Systems Engineering and Information Technology, April, 2017; 5. Gong, L. and Fan, W., Applying Travel Time Reliability Measures in Identifying and Ranking Recurrent Freeway Bottlenecks at Network Level, Accepted for Publication in ASCE Journal of Transportation Engineering, Part A: Systems, March, 2017.

Dr. Mei Sun received the “Best Paper of 2016” award from the Environmental Science and Technology Letters journal for her paper entitled “Legacy and Emerging Perfluoroalkyl Substances Are Important Drinking Water Contaminants in the Cape Fear River Watershed of North Carolina”, <http://pubs.acs.org/doi/full/10.1021/acs.estlett.6b00398>.

Dr. Mariya Munir published three new papers: O'Brien, Evan, **Mariya Munir**, Terence Marsh, Marc Heran, Geoffroy Lesage, Volodymyr V. Tarabara, and Irene Xagorarakis. “Diversity of DNA viruses in effluents of membrane bioreactors in Traverse City, MI (USA) and La Grande Motte (France).” Water Research (2017).

Oun, Amira, Ziqiang Yin, **Mariya Munir**, and Irene Xagorarakis. “Microbial pollution characterization of water and sediment at two beaches in Saginaw Bay, Michigan.” Journal of Great Lakes Research (2017).

Gu, Chaochao, Pin Gao, Fan Yang, Dongxuan An, **Mariya Munir**, Hanzhong Jia, Gang Xue, and Chunyan Ma. “Characterization of extracellular polymeric substances in biofilms under long-term exposure to ciprofloxacin antibiotic using fluorescence excitation-emission matrix and parallel factor analysis.” Environmental Science and Pollution Research (2017): 1-10. ♦

GOOD NEWS for New EPIC Grad Students



The EPIC Graduate Research Award (GRA) Selection Committee recently announced this year's faculty awards. And our **Dr. Miguel Pando** (Associate Professor) is on the list. EPIC, which stands for Energy Production & Infrastructure Center, encourages applicants to submit proposals for energy-related research. Dr. Pando's research topic is “Cost-effective foundation systems for Renewable Energy Infrastructure”.

The EPIC GRA program is a recruitment tool to encourage new graduate students to enroll at UNC Charlotte. The committee is excited about this round of new graduate students and hopes the EPIC GRAs help secure the students enrollment and support the students' good work. The EPIC GRAs pay \$18,000 to PhD students. Masters students get \$15,000.

The other EPIC GRA faculty awards include:

- Dr. Sukumar Kamalasadan: Electrical & Computer Engineering
- Dr. Yong Zhang: Electrical & Computer Engineering
- Dr. Tiefu Zhao: Electrical & Computer Engineering
- Dr. Harish Cherukuri: Mechanical Engineering

To find out more, contact Dr. Pando at mpando@uncc.edu or 704-687-1231. ♦ Source: UNC Charlotte College of Engineering Newsfeed

CANOE TALE, Continued:

PART 2: SOME DUCT TAPE AND A WHOLE LOT OF CONCRETE



[From page 3] Naturally, the 2017 canoe team was disappointed when the race was cancelled. They had planned and practiced long and hard—five months, according to team captain **Sean McFee** (a CEE senior). “We were counting on the points from the race,” says Sean, referring to the scoring scale for the overall concrete competition. The races draw a huge crowd but canoe teams are also judged on much more than speed. Compliance to engineering design standards ranks high, but that’s not as sexy as the race.



Fortunately, weather was cooperative for the UNC Charlotte concrete canoe team back in 1974. This was the first year the new engineering college dared to dip a concrete vessel into the drink. Team members, pictured here on the right, included (left to right) **David Grey, Johnny Graham, Rick Deese, and Bill Crowder** (in the red plaid jacket). They’re proudly displaying their canoe with the winning plaque ... and a few long strips of duct tape. Yeah, duct tape.

“The first ASCE was a big deal and winning was a big deal,” says Johnny. “It was a good canoe, but unfortunately the professors did a race in it and they wrecked it. We had to put back together with duct tape.”

His teammate, William “Bill” Crowder remembers this day too. “It was a real circus,” he recalls, referring to watching the professors’ canoe race, until someone rammed into their boat. Bill had hauled the team’s canoe to Raleigh in the back of his dad’s pickup. Luckily, there was that roll of duct tape in the pickup. Excellent oarsmen, Rick and Bill took the last heat of the race. Paddling (and cussing their careless professors) all the way to victory. ♦

Dr. Johnny Graham (Class of 1975), one of our first doctoral students, was inducted into the UNC Charlotte Alumni Hall of Fame on March 17, 2015. Bill Crowder ('75) is the co-founder and CEO of Crowder Construction in Charlotte. He has also served on our Departmental Advisory Board.

NONTRADITIONAL Success

Travis Carter



Travis Carter graduated in May with a M.S. in construction management. He received his B.S.C.E with a minor in mathematics in 2014. A former transfer student from Forsyth Technical Community College, Travis started work as a Project Engineer Intern with Rentenbach Constructors in Greensboro NC before he officially graduated.

“The CEE curriculum prepared me for success,” Travis says. During his first three years as a UNC Charlotte student, he interned each summer. He made Chancellor’s List and Dean’s List multiple times between 2013 and 2017.

He’s convinced the CEE program enhanced his on-the-job problem solving and public speaking skills. “No task seemed overwhelming,” he shares, “The teamwork that is encouraged in the program prepared me to work with co-workers, superiors, and subordinates in a professional environment.”

Travis chose UNC Charlotte for the excellent career opportunities in an exponentially growing metropolitan region. But Travis also took advantage of the diverse student life. He has great memories of his involvement on campus.

Some of his best experiences came from activities in student organizations like Engineers Without Borders (EWB). Helping local youth learn about engineering during a STEM program coordinated by the student chapter of EWB helped him realize the impact engineers can have on society.

Travis was also a student member of ASCE. He found the ASCE Student Steel Bridge competition to be immensely rewarding, especially the design and fabrication phases. The Steel Bridge competition at the Carolinas Conference allowed him and my peers to showcase their knowledge and abilities in civil engineering. The UNC Charlotte team’s success regionally led to the national competition appearance during his junior year. Congratulations, Travis. We wish you well! ♦

CEE STUDENT SPOTLIGHTS: Aiming High

Blake Bodenhamer



Blake Bodenhamer or Bodie, for short, graduated in May with a Bachelor's in civil engineering, a minor in math, and hundreds of hours in the air — with his camera-mounted drone, that is.

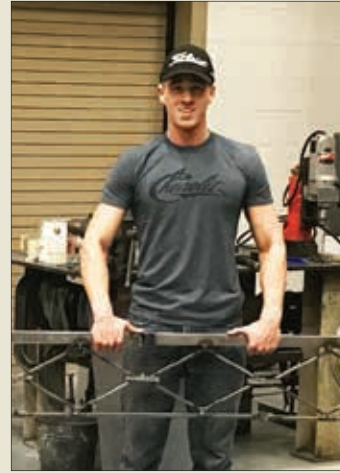
Bodie came to UNC Charlotte in 2012 from North Broward Preparatory High School in Florida. The self-proclaimed lover of LEGO™ sets was also a member of the high school robotics club and knew early on that he would become an engineer one day.

Bodie got his first drone as a Christmas present three years ago and the rest is history. A chance encounter with a fellow photog on campus led to Bodie's side gig — shooting drone photography for the 49er Athletics Department.

After graduating, he went to work for a construction management company in Ft. Lauderdale, FL. He's working as a construction tech and of course, he'll be flying his cameras. Except instead of capturing photos of 49er Football, he'll be using his expertise in this cutting-edge technology to collect images to feed into computer models.

Best wishes, Bodie! The sky's the limit! ♦

Nathan Fuss



This May, **Nathan Fuss** graduated magna cum laude with honors from UNC Charlotte with a B.S.C.E in civil engineering (structures concentration) and with a minor in mathematics.

Nathan started in 2012 with his sights set on becoming a well-rounded credentialed civil engineer. The New York native has been on the Chancellor's List* and Dean's List* multiple times

during his 5-year stay with us. He co-oped with Duke Energy from 2015-2016 and worked one summer internship with the NC Department of Transportation in Statesville, NC during the summer of 2014. Nathan participated in the College's Leadership Academy and became an active member of ASCE.

"I owe much of my success," he says "to the CEE curriculum that has prepared me to be a successful civil engineer." He points out that the curriculum gave him a strong combination of hands-on and theoretical knowledge which translated well into his off-campus work assignments.

Evidence of his preparedness can be seen in his FE exam experience. "I was very nervous," he admits. "Come to find out, I was nervous for absolutely no reason. The second I sat down and started answering question after question, I knew I was going to pass. This showed me how well the CEE curriculum really has prepared me for industry over the past four years."

Nathan started work in Bohler Engineering's Charlotte office immediately after graduation. Way to go, Nate! ♦

CEE PhD Student Wins ACI Fellowship

David Scott, an INES PhD student in the department has received the Barbara S. and W. Calvin McCall Carolina's Fellowship award from the American Concrete Institute (ACI). This Fellowship (\$7,000) was established by the ACI Carolina's Chapter in Calvin and Barbara's name in 2014. Learn more at www.ACIFoundation.org.

*To qualify for the Chancellor's List during the fall or spring semester, a full-time student must earn a grade point average of at least 3.8 in 12 or more semester hours of credit graded A, B, or C, with no grade less than C. To qualify for the Dean's List during the fall or spring semester, a full-time student must earn a grade point average between 3.40 and 3.79 in 12 or more semester hours of credit graded A, B, or C, with no grade less than C.

PARTNERING WITH Industry & Community

NC SCIENCE Festival 2017

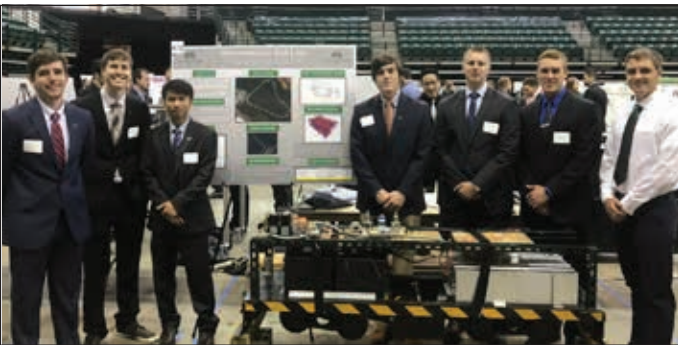


Hundreds of UNC Charlotte faculty and students took part in the the North Carolina Science Festival in April. The CEE volunteers included **Drs. Mariya Munir and Mei Sun**, three graduate students—**Sadhana Vangapalli, Fateme Barancheshme, and Vivek Pulikkal**— and one undergrad, **Savannah Green**. The students created an interactive display entitled “Water Treatment Demonstration”. This demo showed the water treatment fundamentals of filtration, adsorption, and ion exchange.

The Festival, which lasted from April 7 through 23, is an annual hands-on exhibition of STEM in every county in the state. The April 23rd events on campus closed out the 2-week long festival with 100 over STEM-focused activities for all ages, including engineering demonstrations, robots, drones, lab tours, and environmental science.

This year’s Expo was the 7th celebration. Find out more about being a corporate sponsor, volunteer, or participant during next April’s festival – www.ncsciencefestival.org. ♦ Source: UNC Charlotte Newsfeed

2017 SENIOR Design Expo



CEE Demo Rail Team members: (in alpha order) Zachary Chartraw, Blake Estridge, Nathan Fuss, Tim Hensley, Josh Houde, Tim Le, and Sean Triplette. Team advisors (not pictured) were Drs. Erika Weber and Shen-en Chen as well as Mr. David Naylor.

The 2017 College of Engineering Senior Design Expo was held in Halton Arena on May 4. The event was comprised of more than 70 Senior Design 2 teams and almost 25 Senior Design 1 teams, with more than 35 industry supporters.

Most of the CEE teams were split into two planning and design divisions focusing on the Lincoln County Business Park northwest of Mecklenburg County, NC. Their tasks included watershed delineation, best management practice (BMP) design, transportation design, and building design.

The project team shown to the left designed a 2,500-foot rail line and facility for a hydrogen-powered train. The facility design included plans for grading, drainage, and bridge design. This structure, if built, would be the campus center for research and teaching for a cutting-edge locomotive propulsion system known as Hydrail. Read more about another CEE rail propulsion project on page 11. ♦

CEE Undergrad Wins URC Award for the College

CEE Senior, Brandon Lewis presented a poster entitled “Algal Biofuels: Enhancing Biofuel and Biomass Production” at the UNC Charlotte Undergraduate Research Conference (URC) on April 21st. He was awarded the “College of Engineering” award. His research advisor is CEE Professor, Dr. Mariya Munir. Read more about URC at library.uncc.edu/atkins/urc.

A HISTORY Moment

The 2017 ASCE Carolinas Conference was hosted by UNC Charlotte Student Chapter. Eighteen ASCE Student Conferences are held each spring. Conference activities include a business meeting, technical presentations, engineering competitions, social activities, and a banquet.

If you have a bit of CEE historical trivia to share, please send it to us at cee.dept@uncc.edu.



NEW STAFF: Sarah Sonefeld



This January, **Sarah Sonefeld** joined the CEE Department as an Academic Advisor. Prior to UNC Charlotte, she worked for three years as a coordinator for the Department of Pediatrics at East Carolina University, responsible for recruitment, on-boarding, advising and career exploration and special events.

Ms. Sonefeld holds a Masters of Education in Higher Education and Student Affairs from the University of South Carolina and a Bachelors of Arts in Human Development and Family Services from Bowling Green State University in Ohio. She enjoys being outdoors, spending time with her family and friends, remaining active in church and exploring the Charlotte area with her two young children and husband. She is a member of NACADA, a professional organization for academic advisors which promotes student success by advancing the field of academic advising internationally.

UNC Charlotte's Academic Advising Office, which directs advising activities on campus, has several goals. These include providing clear, consistent and up-to-date information for students and faculty/staff advisors in a centralized fashion. Having a professional advisor on staff helps our students better navigate the advising system and allows us more department flexibility. Welcome to CEE, Sarah. ♦

STUDENTS Building Hope

HABITAT FOR HUMANITY CAMPUS CHAPTER



The UNC Charlotte Habitat for Humanity (HFH) Campus Chapter is small but mighty. "It's been tough getting more students out to meetings and builds," says current president **Lisa Appadu**.

Despite those difficulties, the chapter participates in a monthly build with Habitat Charlotte and they volunteer at the HFH ReStore once a month.

On April 22, they held a 5K fundraiser fun run. A percentage of the proceeds from the 5K will go towards the Homecoming House, which is built in the span of two weeks each October, leading up to the 49ers Football Homecoming. "We try to finish the house by the Homecoming game," Lisa says "So we can reveal it to the owner and call it a *homecoming* [for them]."

The HFH student chapter builds a "Homecoming house" every year near East Parking Deck on campus. All UNC Charlotte students volunteer to build, not just engineering students. Habitat affiliates from off campus also join in. Last year, the chapter was able to raise \$50,000.

Lisa Appadu is a CEE senior with a concentration in transportation engineering. The chapter wants to grow its numbers. It currently consists of three civil engineering student. Email cee.dept@uncc.edu to find out more about getting involved with our student HFH chapter. ♦

NEW Student Program



CEE Ambassador Program members: (left-to-right) Megan Kelly, Joseph Locke, Taylor Smith, Tony Brenes

The new CEE Student Ambassador Program started during the Spring semester under the direction of CEE's Academic Advisor, Sarah Sonefeld.

The program uses CEE student volunteers to serve as tour guides and representatives of the Department for events in the EPIC building and during campus recruitment events. There are currently nine student ambassadors—sophomore through senior.

In its first two months of operation, the program served the Department during Explore UNC Charlotte Open House and hosted two high school tour groups.

Ms. Sonefeld's goal is to maintain at least ten students in the program each semester. Prospective ambassadors must have a 3.0 GPA or higher. Even though they operate as unpaid volunteers, ambassadors do get perks like public speaking training and professional development which will greatly benefit our students in the long run. ♦

COAL ASH Research Group @WOCA



UNC CHARLOTTE Coal Ash Research Group

FRONT: (Left to right) Dr. Milind Khire, Dr. Miguel Pando, Linda Hargrove, Banafsheh Saghaei, Sai Sahiti Annamraju, Megan Kelly; 2ND ROW: (L-to-R) Livingstone Dumenu, Dr. Vincent Ogunro, Vona Ojaruega, Dr. Brett Tempest, Abhisek Manikonda, Mehrab Moid; REAR: Dr. John Daniels; Not shown: Chris Hardin and Jenet Hattaway

The 2017 World of Coal Ash (WOCA) Conference was held in Lexington, Kentucky. Eight of the fifteen members of the UNC Charlotte coal ash research group attended. The group is comprised of seven faculty and eight graduate students. In 2015, CEE had more faculty devoted to coal ash research than any other U.S. university.

CEE doctoral student **Jenberu Feyyisa** (not pictured) recently won the 2017 American Coal Ash Association (ACAA) Education Foundation scholarship. The award, presented at WOCA, is based on an essay about the applicant's fly ash research. Jenberu's essay is entitled "Organo-Silane Modified Coal Fly Ash for Use and Leachate Proof Disposal". He will be graduating in December 2017.

WOCA is an international conference organized by the American Coal Ash Association (ACAA) and the University of Kentucky Center for Applied Energy Research (CAER). The 2017 conference is the 7th joint biennial WOCA meeting. The conference focuses on coal combustion products (CCP's) and gasification products. ♦

Source: worldofcoalash.org.

CEE RAIL ENGINEERING: Electrifying Locomotion



TAKING STOCK: CEE grad students taking measurements on the engine they will use for the "green" engine pilot project. CEE will partner with two other engineering departments on campus.

It will become the "Prius of Passenger Rail" Those are the words of Ian Stewart of Rail Propulsion Systems (RPS) as he described the future concept that researchers from the College's EPIC Transportation Energy Research Cluster are helping develop. RPS, in partnership with McDowell Engineering & Associates (MEA), wish to develop a cutting-edge battery-powered hybrid train — in other words, a "green" passenger train. A group of graduate students led by Drs. Shen-En Chen and Nicole Braxtan met with RPS and MEA at the North Carolina Transportation Museum (NCTM) in Spencer, NC on April 13.

The museum will be the demonstration site for an innovative all electric HEP (head-end power) system that will replace one or more diesel generators currently providing electricity to the passenger cars. This HEP system will be installed in an NCTM F40PH locomotive, retired by Amtrak in the early 1990s. The initial project will be small, providing 600kW-hr. of energy storage for HEP power, with a goal to scale up to an all-electric unit with 3000 HP to be used on site at the Museum. The technology demonstrated in this project can then be applied to a passenger train in the form of a zero emissions boost locomotive (ZEBL) that, along with the conventional main engine, will allow the train to

produce 6,000 HP or more, with greater than 20% fuel reduction and greater than 90% emissions reduction. This ZEBL will be ideal for future application to the conventional commuter rail systems used within and between metro areas like Raleigh and Charlotte.

The meeting at the NCTM was the first of many on-site planning meetings with UNC Charlotte. The first of its kind in the U.S., this pilot project will be a multi-disciplinary effort in conjunction with the Electrical and Computer Engineering and Mechanical Engineering Departments. NCTM features vintage planes and automobiles, in addition to an abundance of vintage locomotives. The museum exists on the grounds of historic Spencer Shops, once Southern Railways' largest steam locomotive repair facility in the southeast. The site makes it a fitting place to connect transportation history with the future of green locomotive propulsion. ♦

Source: Ian Stewart, CEO of RPS (railpropulsion.com)

CEE RESEARCHERS Trending



Water Balance Covers for Landfills in the Heart of Texas

How do you solve the permitting issues of complex design of water balance covers for municipal solid waste (MSW) landfills in a large diverse state like Texas? The solid waste regulatory agency, Texas Commission on Environmental Quality (TCEQ), decided

to take a multi-optional approach to this engineering design dilemma. With help from CEE researcher **Dr. Milind V. Khire**, a guidance report was drafted in March for Texas MSW owner/operators and design engineers.

Texas is not only unique because of its size but also because it has 10 distinct regions of precipitation and evapotranspiration potential — or geoclimates — due to less than 10 inches of annual rainfall on the west side of Texas to greater than 60 inches on the east side. TCEQ's "Guidance for Requesting a Water Balance Alternative Final Cover for a Municipal Solid Waste Landfill" presents four options for engineers designing landfill final cover systems in Texas.

The first option is based on a report Dr. Khire completed with funding from The Lone Star Chapter of Texas Solid Waste Association of North America (TxSWANA). Read more at <https://www.tceq.texas.gov/publications/rg/rg-494.html>. ♦

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CEE RESEARCHERS: \$7.7M Transportation Center



UNC Charlotte CAMMSE Team, from left: Drs. Miguel Pando, Marty Kane, Wei Fan, and Dave Weggel; Dr. Yu Wang of Computer Science (not pictured)

In December 2016, several CEE researchers received a \$7.7 million U.S. Department of Transportation (USDOT) grant for an innovative transportation research center. The USDOT announced new grants to 32 University Transportation Centers (UTC), including the UNC Charlotte CEE Department. The new center will be called The Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE). The UTC grants announced by then U.S. Transportation Secretary Anthony Foxx included total nationwide awards of up to \$72.5 million for fiscal year 2016.

With UNC Charlotte as the lead, CAMMSE will be a multi-institutional center that includes Texas Southern University, the University of Connecticut, the University of Texas at Austin and Washington State University. The CEE team has a vision for innovative and broad-sweeping change in transportation. The lead project investigator, **Dr. Wei Fan** shared, "There is much compelling evidence that multimodal transportation plays a key role in the sustainability and efficiency of a transportation system. Multimodal transportation is important in attracting people to urban areas, creating communities that are resilient and robust, and improving the overall quality of life."

Multimodal transportation refers to the integrated network of roads, airports, seaports, rails, transit systems, bicycle and pedestrian trails and walkways. CAMMSE researchers will apply the multimodal term to the movement of people and goods, with the aim of developing innovations to relieve congestion and improve efficiency for both.

Investigators will be working in collaboration with the Charlotte Area Transit System (CATS) and the North Carolina Department of Transportation (NCDOT). "At UNC Charlotte we have expert faculty and great resources to help the community," Dr. Fan said. "This center will be very important to the Charlotte area, the great state of North Carolina and the entire Southeast region, as well as the rest of the U.S. We will be using our research expertise to solve real-world problems for CATS and NCDOT." ♦

Source: COE Newsfeed

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UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

IN MEMORY OF: Matt Keatts (MSCE, 2011)



Matthew Keatts, 36, passed away after a 19-month long battle with cancer on the morning of January 18, 2017, with his family by his side. Matt graduated from Riverside High School, received his B.A. in Business Administration from UNC-Chapel Hill, a B.S. in Civil Engineering and a Masters in Engineering, both from UNC Charlotte. He was an employee of S&ME in Charlotte as a Geotechnical Engineer.

In addition to his parents, Matt is survived by his wife, Stacy Fox Keatts and four-year-old daughter, Madilyn Paige Keatts. Matt was a devoted father to Madilyn, whom he adored and was immensely proud of. He loved his work family at S&ME and missed so much being a part of their day-to-day business during his illness.

Those who knew Matt best can truly agree he was one-of-a-kind. He was witty, caring, meticulous, smart and patient. He had many talents and gifts that he shared willingly and was always there to lend a hand to those in need. His family takes comfort knowing his memory will live on in all those who had the privilege to know him. His determination, courage and resilience during his cancer battle was awe-inspiring and he fought with everything he had until the very end.

A memorial service was held on January 22nd in Durham, NC. Per Matt's wishes, in lieu of flowers, the family requests that donations be made to the "Madilyn Keatts Education Fund." Donations can be mailed to the family directly at 317 Lafayette Drive, Hillsborough, NC 27278. ♦