In this issue of Civil Matters, we present a summary of the department’s activities and accomplishments over the past year.

We are proud to showcase our students who have been awarded scholarships and national fellowships to assist them in their studies here at K-State.

In this issue we are also pleased to introduce three new faculty members who have recently joined our CE team. I think you’ll find interesting as well, the story on a joint research project between ourselves and faculty at the University of Kansas that will target wheat breeding trials in the state.

Accomplishments of our students and student organizations, and design teams — who have showcased our educational and professional service activities at the state, regional, national and international levels — are also highlighted in this edition.

FROM THE DEPARTMENT HEAD

We continue to enjoy and employ the completion of the department’s state-of-the-art structural engineering laboratories located in Engineering Hall.

I consider it a distinct honor and privilege to serve as your department head, and extend my sincere thanks to all who have supported and encouraged me and the department over the years. The future looks bright for the civil engineering profession.

Our faculty, staff and students extend an open invitation to drop by for a visit. We’d love to chat with you and show you around the department.

Robert W. “Bobb” Stokes
Department Head and
Civil Engineering Alumni Professorship Honoring
Dr. Robert Snell

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Invest in student success and join Innovation and Inspiration: The Campaign for Kansas State University. Call 785-532-7544, email engineering@found.ksu.edu or log on to inspire.ksu.edu to learn more.
Collecting large amounts of plant trait data in the field is difficult, especially when plant canopies are dense. Steve Welch, a professor in K-State’s agronomy department, along with co-principal investigators Nathan Albin and David Steward at K-State and Carl Leuschen at the University of Kansas, has received a $300,000 grant to test a new approach. According to Welch, wheat, rice, maize and sorghum average barely 50 percent of the annual yield progress rate necessary to meet food needs widely forecast for 2050. Breeding rates are accelerating, but technological limits impede collection of large amounts of needed plant trait data.

“This project targets Kansas wheat breeding trials, which can provide a proof-of-concept test combining microwave radar sensing with novel algorithms to improve the situation,” Welch said.

The project exemplifies the networking that modern science requires. Steward, who is a professor of civil engineering, and Albin, an associate professor of mathematics, will develop key signal processing equations for the study. Leuschen, associate professor of electrical engineering, will take radar measurements, initially in a large anechoic chamber, which provides an electromagnetically quiet and controlled environment, and then in wheat fields. The researchers said their collaboration highlights the expertise universities offer to society and how their fields overlap.

“We have developed state-of-the-art radar instrumentation for monitoring the planet’s ice cover at the Center for Remote Sensing of Ice Sheets, and it is rewarding to see these technologies being used for other applications, and even better for applications in our own state,” Leuschen said.

“It is important to have the most detailed information we can get about our changing planet, and if there are commonalities we can exploit between sensing ice fields and wheat fields, then so much the better,” he said.

The grant is from the U.S. Department of Agriculture National Institute of Food and Agriculture Early Concept Grants for Exploratory Research program focused on plant and animal phenomics and microbiomes. The program is a partnership with the National Science Foundation on emerging research in the areas of phenomics and microbiomes.

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MARSTON JOINS CE FACULTY

Before pursuing his doctorate, he worked in both the private and public sectors. He spent a year at Jones and Carter, Inc. as a design engineer before beginning a four-year stint with the U.S. Army Corps of Engineers as a hydrologist and hydraulic engineer. With the Corps, Marston primarily worked on flood and dam risk assessments, which involved extensive hydrologic and hydraulic system modeling. He spent part of his career working at the Corps’ research and policy centers, including the Risk Management Center, International Center for Integrated Water Resources Management and the Hydrologic Engineering Center. He obtained his professional engineering license in 2013. His research explores the interdependencies between food, water, energy and trade in order to establish tradeoffs, assess risk, and inform sustainable policy and management of these resources. More generally, he is interested in how society and water resources co-evolve across different scales in a coupled human-nature system. His research is inherently interdisciplinary, drawing from hydrology, water resources engineering and economics. His work has been covered by the New York Times, TIME Magazine and the Los Angeles Times, among others.

Marston earned his bachelor’s degree in civil engineering and MBA from the University of Kentucky, his master’s degree in civil engineering from Texas A&M University, and is scheduled to receive his degree in civil engineering from Texas University of Kentucky, his master’s and doctorate degrees in civil and environmental engineering and focuses on advancing the understanding of diverse catabolic activities of microbes, and how to harness their activities for environmental engineering applications.

His research is in the area of environmental engineering and focuses on advancing the understanding of diverse catabolic activities of microbes, and how to harness their activities for environmental engineering applications. Specifically, he investigates biotransformation pathways of contaminants of emerging concern, or CECs, and develops biotechnologies to control, reduce and utilize greenhouse gases. A major research thrust has focused on biologically mediated abiotic degradation processes acting on CECs, including endocrine disruptors and perfluorinated compounds. His research also examines plant-microbe interactions using plant stem cells for environmental engineering applications.

JONES JOINS CE DEPARTMENT

Christopher Jones joined the CE department as associate professor in August 2017. He holds bachelor’s, master’s and doctorate degrees in civil engineering from Texas A&M University, as well as a bachelor’s degree in physical science from Southwestern University. Prior to joining the K-State faculty, Jones served as a principal member of the technical staff at Sandia National Laboratories, where he led the Nuclear Power Reactor Containment Integrity Research program within Sandia’s Nuclear Energy and Fuel Cycle Programs Center. Jones has technical expertise in the areas of computational mechanics, particularly for transient dynamics to include blast and impact loading, beyond design-basis internal pressurization loading, as well as materials science for cement-based materials. He has worked primarily with the U.S. Nuclear Regulatory Commission and Department of Energy, and anticipates collaborative research with the K-State mechanical and nuclear engineering department.

At Sandia, Jones received research awards from the U.S. Nuclear Regulatory Commission and the U.S. Department of Energy. He hopes to continue to foster relationships with these organizations, as well as develop new partnerships with the Kansas Department of Transportation and the Federal Highway Administration. He strongly values collaboration to support the central teaching, research, and scholarship mission and vision of the College of Engineering and Kansas State University.
JUNG GRADUATE SCHOLARSHIP IN ENGINEERING

Xingdong Wu, CE doctoral student, has been selected to receive the Jung Graduate Scholarship in Engineering for the 2017-18 school year. This scholarship was established by Robert I-Jen, 1968 K-State master's graduate in mechanical engineering, and Sophia Shui-Kan Jung, to support Kansas State University, the College of Engineering and graduate students. The graduate award recognizes outstanding engineering students from the People's Republic of China and Republic of China.

Wenji Zhang, and Qihui Yang, both doctoral students in ECE, and Huan Wang, doctoral student in CHE, were also named recipients.

CE STUDENTS ATTEND TRB ANNUAL MEETING

The Transportation Research Board 96th Annual Meeting was held Jan. 8-12, 2017, at the Walter E. Washington Convention Center, Washington, D.C. The information-packed program attracted more than 12,000 transportation professionals from around the world. The meeting program covered all transportation modes, with more than 5,000 presentations in more than 800 sessions and workshops, addressing topics of interest to policy makers, administrators, practitioners, researchers, and representatives of government, industry and academic institutions.

Two civil engineering graduate students working in the traffic engineering and safety area, Uditha Galgamuwa and Sameera Chaturanga, attended and presented papers at this year’s meeting. Their adviser, Sunanda Dissanayake, professor in civil engineering, is working on several research projects related to practical applications in transportation engineering. The students’ travel was funded by the Graduate School and the department of civil engineering, providing them a valuable networking opportunity.

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STEEL BRIDGE TEAM WINS REGIONAL COMPETITION, QUALIFIES FOR NATIONALS

The Kansas State University Steel Bridge Team won first place at the American Society of Civil Engineers/American Institute of Steel Construction Mid-Continent Student Regional Conference April 21 at the University of Arkansas, Fayetteville.

The highly competitive conference saw 13 universities competing to win first or second place to qualify for the national competition over Memorial Day weekend at Oregon State University. The K-State team won first-place awards in the categories of efficiency, lightness and lateral stability. Team captains are Isaac Klugh and Andrew Foerster, both seniors in civil engineering.

Engineering Leadership and Innovation: K-State was 25th out of 43 teams and placed 8th in the stiffness category.
The civil engineering department offers graduate-level courses leading to a master of science degree in civil engineering to off-campus students — no matter where they live. All courses needed for the degree will be offered online or by other multimedia delivery methods. At the end of their program, students need to complete an oral examination conducted by their graduate committee. A master’s degree can also be counted as a year of credit toward earning a professional engineering license. For information on earning this license, go to the Kansas Board of Technical Professions online at ksboard.ks.gov/.

ABET STUDENT OUTCOMES

1. an ability to apply knowledge of mathematics, science, and engineering
2. an ability to design and conduct experiments, as well as to analyze and interpret data;
3. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
4. an ability to function on multidisciplinary teams;
5. an ability to communicate effectively;
6. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social context;
7. a recognition of the need for, and an ability to engage in, life-long learning;
8. an ability to design and conduct experiments, as well as to analyze and interpret data;
9. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

2017 CE DEPARTMENT AWARDS

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ESMAEILY NAMED ASCE REGION 7 OUTSTANDING STUDENT CHAPTER FACULTY ADVISOR

Asad Esmaeily, professor of civil engineering, has been recognized by the ASCE Region 7 Board of Governors as one of this year’s recipients of the Region 7 Outstanding Faculty/Practitioner Advisor Award.

In announcing the award, Region 7 Governor Aaron Frits noted of Esmaeily, “Your contributions to both the profession and Kansas State University are very significant as noted in your nomination form; your involvement with various ASCE committees both as a member and as an officer exemplify your commitment to civil engineering.

“A well, your dedication to the students at K-State is illustrated by the comments your students and colleagues shared with us — your extra efforts did not go unnoticed by your peers and students. Lastly, I have personally noticed your continued efforts to enhance the student chapter success at KSU in the various meetings I have been able to attend. You have always been there for the students with a smile on your face and a willingness to stay involved and engaged,” he said.

“I applaud your efforts to lead by example to your students, as it is clear you are succeeding in being an excellent role model for them to emulate.”
Members of the K-State student chapter of Engineers Without Borders, or EWB, ventured south in January 2017 to Guatemala for the beginning phase of their most recent project in the small rural community of El Amate.

Civil engineering students Jack Olsson, Kristen Jones, Chad Olney and Matthew Horner, along with Jodie Ladner from the department of biological and agricultural engineering, and Anna Zuercher from architectural engineering, made the trip. They were accompanied by professional mentor, David Hoffman, and cultural liaison, Irma Ailon, a recent K-State graduate and Guatemalan native.

EWB is an international service organization dedicated to helping developing communities meet their basic human needs by providing engineering expertise and support for various infrastructure and community projects.

K-State has been working with the community of El Amate, Guatemala, for the last three years. In the summer of 2016, the first phase of the program was completed with the construction of a two-room school building. Now the chapter is working with the community to implement a sanitation system to go with the new school.

Chad Olney, Kansas State University senior in civil engineering, Winfield, has been awarded a Science, Mathematics And Research for Transformation, or SMART, Scholarship for Service for the 2017-18 academic year.

The program, established by the U.S. Department of Defense, supports undergraduate and graduate students pursuing degrees in science, technology, engineering and mathematics, or STEM, disciplines. Along with his civil engineering major, Olney is pursuing a secondary major in natural resources and environmental sciences, and a minor in Spanish.

Awardees receive full tuition payment for the year of the award, a $25,000 per year stipend, and guaranteed employment at a sponsoring DOD facility upon graduation. Olney’s sponsoring facility is the U.S. Army Corps of Engineers Office in Kansas City, Missouri.

Olney serves as president of the university’s student chapter of the American Society of Civil Engineers, is in charge of large fundraising for Engineers Without Borders, and is a member of the civil engineering honor society, Chi Epsilon.

In 2016, the most recent year of completed data, 239 students were awarded DOD SMART scholarships, 12 percent of all applicants reviewed. Of those selected, the average GPA was 3.7. Olney is the son of Mark and Pam Olney, Winfield.
The mission of the council is to provide a continuing liaison between the academic community and practicing profession, and to assist the civil engineering department, the College of Engineering and Kansas State University in providing the highest quality of civil engineering education. Functions of the council are to review programs and goals, and advise the department head and dean of the college.

BACK ROW (LEFT TO RIGHT): SCOTT UHL, BRAD FAGAN, DON ALLISON, JOE SURMEIER, GARY JANZEN, JEFF HANCOCK; FRONT ROW (LEFT TO RIGHT): GREGG GREENWOOD, JERRY WESTHOFF, CATHERINE PATRICK, KAREN BECKER, ANDY BUSSING; NOT PICTURED: KEVIN DAY, CATHY RITTER