NUTS BOLTS BOLTS AND NEUTRONS MECHANICAL AND NUCLEAR ENGINEERING FALL 2018





FROM THE DEPARTMENT HEAD

I take pleasure in welcoming you to the mechanical and nuclear engineering (MNE) department's fall 2018 newsletter. Our department continues to flourish. In the newsletter you will be introduced to our newest faculty member, and you will find we graduated 180 undergraduate students. We continue to maintain a graduate program that has a Ph.D. enrollment of 50 or above. We succeeded in coming through our ABET accreditation visit with only minor concerns, assuring we will maintain our accreditation. Our MNE industry advisory council (IAC) has grown to 13 members, and we will meet with the advisory councils of the engineering college and other engineering departments in October. I welcome Neal Johnson as the new chair of our IAC.

A strong measure of the health of a university department is the amount of research funding expended per year, per tenured or tenure-track faculty (TTF) member. Our funding by this measure has grown the last few years and the number of significant new project awards during the last year will ensure this growth continues next year. We have a five-year goal of achieving annual expenditures of \$300,000 per TTF. The driving force behind this growth is the quality of the faculty. Various accomplishments will be presented in this issue, but I would like to highlight four of our faculty here: Gurpreet Singh was awarded, as principal investigator, a \$4,700,000 project by the National Science Foundation. Melanie Derby was recognized as the Hal and Mary Siegele Professor in Engineering. Amy Betz organized a conference in Dubrovnik, Croatia; and Hitesh Bindra is organizing a conference in Mumbai, India.

We now have 29 faculty members and are searching for three more, which will bring us to our largest total in history. We have more than 1,000 students — about 950 undergraduate and 70 graduate — enrolled in our MNE programs. I hope you will enjoy reading more about the department in this newsletter.



William Aler

William L. Dunn Department head Steven M. and Kay L. Theede Chair in Engineering







DITS AND NEUTRONS E ENGINEERING FALL 2018 COLLEGE OF ENGINEERING

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ON THE COVER WILLIE CHECKS OUT THE SAE BAJA CAR.

LEFT

MNE GRAD STUDENT ADJUSTS SETTINGS ON THE ELECTRON MICROSCOPE.

NUTS, BOLTS AND NEUTRONS

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EXCELLENCE

K-STATE HONORS INVENTORS

Tests to detect early stage cancers, herbicide-resistant sorghum and Hessian fly-resistant crops, devices that detect dangerous radiation, vaccines for a dangerous disease that affects both animals and humans, and drugs to treat Alzheimer's disease were among the innovations that Kansas State University researchers patented in 2017. K-State wheat breeders also received a plant variety protection certificate for a recently released variety.

Provost April Mason and Vice President for Research Peter Dorhout hosted a reception on April 5, 2018, to honor 2017 patent and plant variety protection certificate recipients. Honorees received patent plagues, and first-time inventors received certificates from the National Academy of Inventors.

The honorees join a long list of researchers who have worked with the Kansas State University Research Foundation, or KSURF, which facilitates and manages technology transfer for

K-State faculty. Through the years, researchers and KSURF have collaborated on more than 250 patents.

Dorhout said K-State has a strong record of innovations in a diverse array of fields.

"Our researchers are committed to protecting our food supply, improving human health and supporting the economic success of our state. They

"Our job is to help researchers protect and commercialize innovations, and we are excited to see the list of K-State inventors continue to grow at record pace."

— Chris Brandt

demonstrate that commitment by ensuring that their work makes it to the marketplace," he said.

Chris Brandt, president of KSURF, said he is eager to assist researchers in their efforts to get their inventions into the hands of the public.

"Our job is to help researchers protect and commercialize innovations, and we are excited to see the list of K-State inventors continue to grow at record pace," Brandt said.

U.S. patent recipients in MNE:

Steven L. Bellinger, nuclear engineering

William L. Dunn, nuclear engineering Ryan G. Fronk, nuclear engineering

Douglas S. McGregor, nuclear engineering

John K. Shultis, nuclear engineering

Gurpreet Singh and Lamuel David, mechanical engineering



Amy Betz, associate professor, and Melanie Derby, assistant professor, both of mechanical and nuclear engineering at Kansas State University, are participants in a statewide \$1.125 million project funded through the NASA EPSCoR Cooperative Agreement Notice, or CAN, program.

Wichita State University, the lead on the project, will develop new manufacturing techniques to fabricate complex 3-D structures at the microscale in metals.

Betz, principal investigator, and Derby, co-lead, have been awarded \$289,000 to design and test wicking structures, fabricated at Wichita State University, to enhance water collection and heat transport. The remainder of the funds will be distributed to other Kansas universities.

The project, "Efficient and Compact Thermal and Water Management Systems Using Novel Capillary Structure for Space Technology," will also investigate controlling transport of water and heat to allow for significant improvements of indoor environments in space suits, vehicles and stations.

"This work will lead to new fundamental insight into water and heat transport, allowing for lighter and more efficient heat exchangers and water collection units for space applications," Betz said. "These results may also lead to cheaper and more compact heat exchangers on earth."

The three-year award will enhance both research and teaching at Kansas State University, with results from the research to be used in several class projects and outreach activities.

"We expect the work done through this award to promote a long-term relationship between K-State and NASA research centers," Betz said.

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FRONK

McGREGOR







ENGINEERING RESEARCHERS TO SHARE IN A MORE THAN







MELANIE DERBY, RIGHT, INSTRUCTS A STUDENT IN THE LAB.

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K-STATE RESEARCH TEAM WINS R&D 100 AWARD FOR WEARABLE RADIATION DETECTION TECHNOLOGY



K-STATE AWARD-WINNING RESEARCH TEAM, FROM LEFT, FRONT ROW: RUSSELL TAYLOR, RYAN FRONK AND DOUGLAS McGREGOR; MIDDLE ROW: LOGAN WHITMORE AND TIM SOBERING; AND BACK ROW: TAYLOR OCHS, STEVEN BELLINGER AND LUKE HENSON

A Kansas State University research team has won a 2017 R&D 100 Award for a vest specially designed to contain devices that detect illicit nuclear material. This is the team's fifth award since 2005 for one of the year's 100 top technologies awarded by R&D magazine.

Douglas McGregor, university distinguished professor of mechanical and nuclear engineering, led the team of Kansas State University, industry and government contributors to develop a vest designed to contain multiple gamma ray and neutron detectors. The garment allows the wearer to blend into the environment while detecting dangerous radiation, and the general direction of its origin, with wired or wireless small, lightweight, modular detectors that operate for weeks at a time.

"Our vest is innovative because it's the first of its kind that is built to be wearable, clandestine and integrated so that it's hands-free," McGregor said.

The functional garment is the result of collaborative efforts to develop radiation

detector technologies while ensuring that all components and the vest could be manufactured and mass-produced. The project was funded by the Defense Threat Reduction Agency. Contributors included Radiation Detection Technologies Inc.; Kansas State University's Semiconductor Materials and Radiological Technologies Laboratory, or SMART Lab, and Electronics Design Laboratory; and Alion Science and Technology Corporation. SMART Lab faculty and graduate students designed the detectors; Electronic Design Laboratory staff and students built the electronics; Radiation Detection Technologies integrated the products; and Alion, along with McGregor's students, produced the communications protocols and software.

The project group also worked with Emily Pascoe, a doctoral student in the apparel, textiles, and interior design department at Kansas State University. Pascoe's expertise ensured the team used the correct fabric, notions and construction methods for the vest.

The coveted R&D 100 Award emphasizes the bringing of inventions from their initial concepts on the blackboard, through research and development, and into the commercial marketplace.

"A lot of inventions are good but they never go past publishing a paper," McGregor said. "Our invention is in commercialization. I enjoy the pure sciences, but I keep my eye on practicality."

According to McGregor, the character of Kansas State University students along with the availability of in-house electronics design expertise have bolstered his group's success and ability to compete for the R&D 100 Award alongside national labs, large multinational corporations and top universities.

"I credit the students and people I work with," McGregor said. "The work ethic I've encountered and the fact that the Electronics Design Laboratory is next door — if I didn't have a shop like that next door, I don't know how successful we would have been. All these things come together to give us the success we have now." The project has been in development for three years.

Ryan Fronk, research associate in mechanical and nuclear engineering, completed his doctorate in May 2017 and worked on the project as a student. He started by designing and simulating the original concept of the vest while investigating the standards for detection technologies in an effort to meet or exceed them. Packaging design for the detector devices was a major hurdle.

"I credit the students and people I work with. The work ethic I've encountered and the fact that the Electronics Design Laboratory is next door — if I didn't have a shop like that next door, I don't know how successful we would have been. All these things come together to give us the success we have now."

. . .

— Douglas McGregor

Logan Whitmore also worked on the project as a student while finishing his degree. As an Electronics Design Laboratory employee, he worked on the electronics for the devices.

"A challenging aspect was meeting the low-power goals for the devices," Whitmore said. "We had to extend the life and ranges of both wired and wireless devices with lots of technologies that were fun to use." Another Kansas State University alumnus, Steven Bellinger, is the founder and CEO of Radiation Detection Technologies. His company specializes in commercializing novel technologies developed at the university. Bellinger holds five U.S. patents on detector designs and has more pending. He said developing a reliable, marketable product is paramount.

"We ask how we will put this together to meet the user's needs in terms of size, profile, duration, how it fits, the weight — and we need it to be economical," Bellinger said. "The Department of Defense will buy only so many, so we look to see what other sectors we can service such as nuclear power and health care. We have demonstrated the technology in Japan and Hawaii as well as Washington, D.C."

Commercializing technology is known as traversing the Valley of Death. According to Taylor Ochs, doctoral student in nuclear engineering, the analogy is apt because the process is never simple. Working on the project has helped him understand how large collaborations come together as he completes his individual tasks.

"A lot of what I did was the first assemblystage testing," Ochs said. "If I plug in nine parts, do they work? If I plug in 10, do they work? We have to troubleshoot and fix them. You've got to be able to learn from and accept failures. You run into the wall, break through, and there's another wall behind it, but you end up with a well-developed system," he said.

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UNIVERSITY ENGINEERING TEAM TO DESIGN, ANALYZE AND TEST AGAINST HIGH-LEVEL RADIOLOGICAL MATERIALS THREAT

From military groups to local first responders, newly funded radiation detection research at Kansas State University is expected to have farreaching benefits.

The U.S. Department of Defense Space and Naval Warfare Systems Command has executed \$100,000 for year one of "Radiological Systems Research for Detection, Localization and Isotope Identification," as part of a five-year initial award contract valued at \$2.2 million.

The funds will support research and development of mobile radiation detection systems and their components used to find, localize and identify threatening radiological materials. Tasks undertaken will involve design, analysis and testing of state-of-the-art sensing technologies and their supporting systems.

Walter McNeil, assistant professor of mechanical and nuclear engineering, is the lead investigator, and providing project support will be Don Gruenbacher, associate professor and department head, and Bala Natarajan, professor, both electrical and computer engineering; and Amir Bahadori, assistant professor of mechanical and nuclear engineering.

"This is a multidisciplinary approach that will leverage the experience of K-State engineering faculty in radiation-sensing materials, sensor read-out, signalprocessing and advanced data analysis, all of which are embedded within mobile instrumentation," McNeil said.

From military groups to local first responders, newly funded radiation detection research at Kansas State University is expected to have far-reaching benefits.

Testing will include assessment of radiological dispersal devices or "dirty bombs" at national laboratory test sites such as Idaho National Laboratory, and will also collaborate with local military platoons at Fort Riley, such as the nuclear biological chemical reconnaissance vehicle platoon of the 48th Chemical Brigade.



"The mobile detection systems and methods explored in this work will benefit small military groups tasked with facing radiological threats in combat scenarios," McNeil said. "Domestically, these technologies are utilized by first responders and other emergency response personnel."

Resulting equipment investigated may be deployed on a variety of platforms, including light-armored military vehicles, unmanned systems and personnel.

INSTRUCTOR JOINS MNE DEPARTMENT



Previously, Abdo served as a postdoctoral research scholar at North Carolina State University under Professor Nam Dinh, where he explored state-of-the-art, machinelearning algorithms and their applications to thermal-hydraulics. He completed graduate studies and earned his Ph.D. degree in nuclear engineering at North Carolina State University

MECHANICAL ENGINEERING RECOGNIZED FOR ASSESSMENT EFFORTS

program as this year's recipient of the Excellence in Assessment citation.

achievements in the following areas:

- utilization of assessable criteria to measure student demonstrations of outcomes.
- innovative implementation of Canvas for data collection,
- clearly defined levels of achievement that expose specific learning needs, and
- use of automated dashboards to analyze assessment results.

Leading the assessment efforts in this program was Kevin Wanklyn, MNE teaching assistant professor.



Mohammad Abdo has joined the department of mechanical and nuclear engineering as an instructor. Under the tutelage of Professor Jeremy Roberts, he had previously conducted research in the areas of computational nuclear engineering, reduced-order modeling, machine learning and uncertainty quantification.

under Professor Hany Abdel-Khalik, and did his undergraduate work at Alexandria University, Egypt, where he earned his bachelor's degree in mechanical engineering.

Abdo spent one year at Purdue University as a visiting student researcher, and 11 years as a part-time/full-time teaching assistant/ demonstrator in the mechanical engineering department at Alexandria University and Pharos University, respectively. He has taught courses such as mathematics, statics, dynamics and mechanical vibrations. In helping to teach the course "Fundamentals of Nuclear Engineering" at both N.C State and Purdue, he was nominated for the Outstanding TA Award.

- The K-State Office of Assessment selected the mechanical engineering undergraduate
- The mechanical engineering undergraduate program was recognized for its efforts and



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EXCELLENCE

STUDENT RECOGNITION

MNE encourages students to pursue excellence by participating in creative inquiry teams, submitting conference papers and posters, and getting involved in leadership roles on campus. Congratulations to all the MNE students who were recognized for their excellence this year.

CREATIVE INQUIRY TEAMS

Wildcat Wind Power team — U.S. Department of Energy Collegiate Wind Competition — 3rd place

SAE Baja — 16th place, endurance

PAPERS/POSTERS/PRESENTATIONS

ASME poster competition — Dipta Sarkar, 2nd place

ASHRAE — Ryan Huber, 1st place, doctoral student division

Consortium for Nonproliferation Enabling Capabilities/NNSA University Program Review — Nathanael Simerl, Best Oral Presentation

CAMPUS LEADERSHIP

2018 K-State Student Ambassadors — Darrell Reese Jr.

2018 College of Engineering Ambassadors — Ronaldo Lopez, Robert Wasinger, Jack Cashman, Syrus Herz, Ali Karamali, Adam Owens, Robert Small, Ryan Boland, Cade Harms, Emilee Agnew, Caleb Cox, Aaron Pachta



WILDCAT WIND POWER TEAM — FIRST ROW, FROM LEFT: SAMUEL PINT, JACOB MCAFEE, TYLER KODANAZ, JOEL PEGG AND WARREN WHIT SECOND ROW: RUTH MILLER, JUSTICE CATRON, JACOB MEYER, JACKSON JENNINGS AND ANDREW RIESCHICK. THIRD ROW: MILAN KLEMPAY, SIMON CIBULKA, WILL BROWNLEE AND SAM WILSON.

EXCELLENCE

Chancellor's Fellowship from UC Berkeley — Sarah Stevenson

- Steel Ring Honorary Society Ethan Hammond, Gabi Biby
- Silver Key, sophomore honor society Jacob Nixon

Blue Key Scholarship — Antonio Carter

Quest Honorary Society — Ali Karamali, Ronaldo Lopez, Justin Schieber

COE Open House — Yellow Brick Award

COE Open House — Best Children's Display

Student Employee of the Year nominee — Nicholas Bradley

Travel grant — Mohamad Cheikh

MNE Senior Awards (see next page)





December 2017





K-State Mechanical and Nuclear Engineering

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MNE STUDENTS RECEIVE THE YELLOW BRICK AWARD FOR BEST SKIT DURING 2018 ENGINEERING OPEN HOUSE



NICHOLAS BRADLEY, FINALIST FOR STUDENT EMPLOYEE OF THE YEAR, IS RECOGNIZED BY PAT BOSCO, VICE PRESIDENT OF STUDENT LIFE AND DEAN OF STUDENTS.



Extraordinary Leadership and Service







Nuts, Bolts and Neutrons • Fall 2018

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Ph.D. graduates Spring 2018

Haotian Gao Louis B. Wonnell

M.S. graduates Fall 2017

Derek James Black Jeremy Wayne Hass Jeffrey Thomas Hicks

Spring 2018

Hatim Hamid Alrifaai

Nuclear

Michael Fuller

B.S. graduates Fall 2017

Joshua Ryan Affholder Tyler B. Albright Rakan Ahmed J. Ashi Jace Alan Beavers Rachel Nicole Bohm Blake Andrew Bombardier Hannah Elizabeth Bongers Eric Austin Brown Trevor Michael Brown Brent Broxterman Haley Anne Brun Collin Matthew Douglas Buller Leroy James Burke Kord Byers

Joshua Alexander Camarena Trevor D. Carpenter **David Austin Chandler** Wavne Thomas Chism Muhammad Abdullah Choudhry William Christopher Clark Lucas Coyne Commerford **Olivia Paige Cox** Joseph Michael Cribbin **Damian Anton Cyr Kolton Chandler Decker** Matthew Charles Dolezal **Killian Doze** Alex Christian Dzewaltowski Matthew Lawrence Esquibel Adam Lee Ewing Zackary Ewing **Kyler Michael Farmer Heather Renae Ferry Mitchell Scott Fowler** Peter James Gardner Brendan Charles Gundy James Thomas Hamilton Andrew Weston Harlow Halie Jane Headrick **Benjamin Dayton Hower** Ali H A M E Jamal **Christopher Jacob Kehr** Michael Lynn Kelley **Chandler Klamm** Brian L. Koenig Julie Mae Kohl Eli Koziol **Clark William Kroupa** Nicholas Tyler Kuchta Andrew Michael Llewelyn

Seth Allen Martin

Matthew I. McAllister **Jeffrey Brian Morrow Taylor Nicholas Murphy** Nathan Cole Pageler Vashishth Janakbhai Patel Gabe Alan Probst Mary Catherine Ross **Christian Nathaneal Sasher Ronald Andres Sastoque Prieto Devin Martin Schottler Austin Marsh Schuberth Austin James Scott Caleb Shunatona** Luke Alan Stallbaumer **Garrett Noel Stewart** Valerie Vega Zakery Joel Voelker Austin David Wiley **Paige Williams Zachary Thomas Williams** Joseph Shawn Wolfenberger **Tyler James Woodman Dustin Woolsey**

B.S. graduates with Nuclear Option

Spring 2018

Morgan Lea Bailey Taylor Eric Ballinger Jerrod Christopher Conley Jacob Patrick Culvey Jacob Wesley Hayhurst Connor Justin Munk Rebecca Brooke Paul Graham Scott Wilson

B.S. graduates Spring 2018

Mohammed Burair Al Jafar Mohmed Ahmed Alabdulaali Andrew D. Arnold Diana Jagueline Arreola Jacob J. Bambick **Aaron Scott Bloom Adam John Bowers** Nicholas Peter Bradley Matthew Russell Bryan Spencer David Ray Buff Michael John Buffkin **Taylor S. Carlson Michael Adrian Cesena** Eliiah Samuel Clark Jeremiah Brian Clark Nicklaus Nathan Corder Calvin M. Dahms Zhonghan Deng Jacob David Dennett **Ryan J. Deters** Nathan W. Dewell Matthew Bryan Duncan **Barkley Alexander Edison** Jared Enns **Jonathan Michael Estes Cody John Freeman Brandon Allen Fullington Connor Wesley Gannaway** John Russell George **Aaron James Gleason** Dain Glenn Matthew William Grosdidier **Giselle Alejandra Guanes-Melgarejo Hunter Allen Harlow**

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CONGRATULATIONS MECHANICAL AND NUCLEAR ENGINEERING GRADUATES

Philip Whaley Harsh Chase Alexander Harvey Samantha Lynn Hecker **Caden Wayne Hilger Gerrett Reed Hodges Kaitlyn Hoover Kellan Christian Horner Blake Irvin Hughey Christian Tyler Janota Jackson Jennings Cameron Dean Jurgens Ryan Kamal Khoury Cameron Andrew Koenigs Chance Kristopher Kurtz** Shawn David Lay Lucas Gene Lindesmith **Parker Christian Little** Marco Antonio Loma-Jasso Levi David Marcotte Nicholas Torrington Mason Zachary William May Jacob Wavne McAfee **Kevin McKeon Anthony Durand Medina** David Robert Meredith Aaron Molleker Nathan Moyer Samuel Warren Oxandale Chad P. Paulv **Dwight Lee Pearson** Joel Allen Pegg Andrew Michael Peuchen Jonathan Daniel Peuchen **Dalton David Porter Tyler Kenneth Puetz Taylor Lynn Ramirez** Joseph Alan Reed

Lucas Charles Richards **Nicholas Carl Rodell** Austin Michael Ruel Arron Lee Sawyer Tracy Gerard Schmitz **Michael Matthew Schulte** Nicholas John Schumacher **Mitchell Gregory Shurtz Cameron Merritt Sinclair Cameron James Solko Emily Marie Stallbaumer** Nicholas Ellison Stec Joshua Michael Stegman Sarah Rachelle Stevenson Jeb Ethan Stewart **Torin Patrick Straub** Patrick Mason Sutherland Michael Tiede **Connor John Torrey** Michael M. Tran David Van Ommen **Kevin Michael Weinand Bailey Nicole Wells Kyler Scott Werth** Logan Robert Williamson Laura Marie Wurm **Timothy John Yonkers**





EADERSHIP

DERBY NAMED TO ENDOWED PROFESSORSHIP

Melanie Derby, assistant professor of mechanical and nuclear engineering at Kansas State University, has been named a recipient of the Hal and Mary Siegele Professorship in Engineering.

The award is created through funds to honor Hal and Mary Siegele on the campus of Kansas State University, and to recruit and retain the highest quality faculty in the College of Engineering. Both Kansas State University alumni, the late Hal Siegele was a 1947 graduate in chemical engineering, and his wife, Mary, is a 1948 graduate in arts and sciences.

As a recipient of the Hal and Mary Siegele Professorship in Engineering, Derby will receive flexible funding annually for five years to help cover needs such as research equipment and supplies, support of personnel involved in her research, professional travel and summer salary.

Derby joined the faculty in the mechanical and nuclear engineering department in 2013, where her research focuses on thermal fluids problems pertaining to the food, energy and water nexus.

She is a former Kansas State University College of Engineering Keystone Research Scholar, and has received a 2017 National Science Foundation CAREER Award, a 2017 American Society of Mechanical Engineering Outstanding Early Career Award, and a 2017 Kansas State University College of Engineering Outstanding Assistant Professor Award.



DERBY, LEFT, IN LAB WITH STUDENTS

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"Melanie Derby is an excellent choice for this endowment." said Darren Dawson, dean of the College of Engineering. "Her outstanding early career accomplishments are strong evidence of how deserving she is of the Siegele professorship — earmarked for retaining this caliber of faculty member."

UNIVERSITY'S ONLINE ENGINEERING MASTER'S PROGRAMS NO. 1 IN NATIONAL RANKING

Kansas State University's online engineering master's programs are the best in the nation according to a new national ranking.

Best College Reviews, which annually ranks the top academic degrees and programs, puts Kansas State University's programs No. 1 on its list of the top 25 best online master's degree programs in engineering for 2018.

The university's programs earned the top spot based on tuition, their customizable options within degree programs, and their "wow" factor, which highlights each program's unique offerings that set it apart from the pack.

Offered in partnership with K-State Global Campus, the College of Engineering has nine online master's degrees available to students: mechanical engineering, nuclear engineering, industrial engineering,

electrical and computer engineering, chemical engineering, civil engineering, software engineering, engineering management and operations research.

The programs are offered fully online and allow students to continue to work and live anywhere they choose.

More information on the program is available at global.k-state.edu/engineering.

FACULTY AWARDS 2018

American Society for Engineering Education (ASEE) Conference Amy Betz, associate professor – Best Paper finalist

Committee on Space Research (COSPAR) Scientific Commission Amir Bahadori, assistant professor - Zeldovich Medal

K-State Mortar Board Kevin Wanklyn, teaching assistant professor - Faculty Recognition Award

American Ceramic Society Bulletin Editorial Advisory Board Gurpreet Singh, associate professor - chair

K-State Olathe Research Showcase Amy Betz, associate professor

KANSAS STATE U N I V E R S I T Y MECHANICAL ENGINEERING EXCELLENCE FUND Here is my check or credit card authorization for a gift of: \$1,000 \$250 \$500 \$100 \$250	Please make check payable to Kansas State University Foundation Credit card payment: Image: Constant of the foundation absorbs the fee charged by your credit card company. As an added benefit to our donors, the foundation absorbs the fee charged by your credit card company. CARD NUMBER EXP. DATE Image: Constant of the foundation absorbs the fee charged by your credit card company. SIGNATURE PHONE Contact me/us about creating a scholarship. Contact me/us about creating a scholarship. Contact me/us about gifts that pay lifetime income. I/We have provided for K-State in my/our will.
Address City State ZIP	Matching gift information If you or someone in your household works for a matching gift company, contact your human resources department to see if your gift qualifies for a company match. For more information, contact our matching gift coordinator by calling 800-432-1578 or visit <u>ksufoundation.org/match</u> .
Phone Email	Thank you for your generous support! Please return this card to: KSU Foundation, P.O. Box 9200, Shawnee Mission, KS 66201-1800. I32000

U.S. patent recipients Steven L. Bellinger, doctoral candidate William L. Dunn, professor Ryan G. Fronk, doctoral candidate Douglas S. McGregor, university distinguished professor Ken Shultis, professor Gurpreet Singh, professor International Journal of Micro Air Vehicles

Mingjun Wei, editorial board

Army Research Lab RAP Program

Mingjun Wei, faculty fellow



College of Engineering

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WARD HALL UNDERGOES MUCH-NEEDED REMODEL





A multi-purpose remodeling project of Ward Hall, with major emphasis of the work on the north wing of the first floor, has been completed. Projects included updates and equipment for the NanoMaterials and Characterization Lab, and Kansas State MicroAnalysis Lab, as well as a refurbishment of the front lobby area.

