

2015 **EXCHANGE** ALUMNI NEWS

Department of Mechanical
and Aerospace Engineering

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THE OHIO STATE UNIVERSITY

Message from the Chair

At the heart of the Department of Mechanical and Aerospace Engineering (MAE) are the students, past and present, who chose to learn, connect, excel and ultimately give back as mentors and leaders. As esteemed alumni, you are shining examples of the critical foundation provided by MAE for success as engineering professionals.



In March 2015, nine months after taking office, Ohio State President Dr. Michael Drake outlined his vision in an investiture ceremony on campus, welcoming a new chapter in Ohio State's history. In his remarks, Dr. Drake outlined his plans to make education more affordable for thousands of undergraduate students, and in June, the affordability initiative was approved by Ohio State University's Board of Trustees, lowering the cost and improving the value of students' Ohio

State education. We will build upon this university-wide initiative to ensure we are creating increased opportunities for our aspiring undergraduate engineering students.

In a recent message to the university community thanking them for their support, Dr. Drake quoted an Ohio State national champion wrestler who said, "People do not come to Ohio State to be ordinary." In this issue of Exchange, we will bring relevance to the extraordinary – the excellence of our programs, institutional research, innovative curriculum and the outstanding accomplishments of our students, faculty and distinguished alumni – supporting our mission of generating and disseminating original knowledge and creating inventive solutions to today's societal challenges. We also remember in retrospect Bertha Lamme-Feicht, an extraordinary pioneer in engineering and the first woman to receive an engineering degree at Ohio State.

Throughout this publication are stories of unique educational objectives and teaching innovation, and departmental and college recognition of excellence within our engineering community. Teaching excellence is underscored in the expansion of the senior capstone experience and redesign of laboratory courses in the undergraduate program. The quality of our students is evidenced in numerous prestigious presidential and undergraduate fellowships, top honors won in business plan competitions and best paper and presentation awards. MAE students are undeniably the future of engineering practice.

Our department and college alumni, teaching and student awards celebrate institutional, scholarly and career accomplishments and the wide-ranging impact the engineering profession is making in the world today. In fact, a recent survey analysis by the National Association of Colleges and Employers (NACE) confirms that engineering is one of the most profitable college majors and that our graduates are in high demand.

Continuing our tradition of Buckeye commitment, service and pride are seven prominent MAE alumni recognized last April at the annual Honors and Awards Ceremony. Associate Professors Junmin Wang, Jack McNamara and Haijun Su, Professor Tunc Aldemir and Research Scientist David Talbot were honored at the college's annual Distinguished Faculty Awards ceremony. Three alumni will be honored during Homecoming Weekend in October at the 18th Annual Alumni Awards; Ardeshir Contractor and Frank Paluch will be presented with the Distinguished Alumnus

Award and Robert Nerem with the Lamme Meritorious Achievement Medal for "meritorious achievement in engineering."

You will be inspired by our Close-Up interview with Gary Kinzel, respected alumnus and scholar, and two alumni spotlight stories featuring Paritosh Ambekar, healthcare industry expert and this year's recipient of the E.G. Bailey Entrepreneurship Award and Bruce Lavash, distinguished alumnus,

whose endowed family scholarship fund will help young engineers grow and succeed in the profession. These compelling stories are the epitome of Buckeye Pride, instilling the highest values on behalf of the department and the broader university community. Finally, in Development News you will read about a new opportunity for giving through the Dr. Gerald M. Gregorek Endowment established by External Aerospace Advisory Board members, and you will learn more about ways in which our Leadership Fund is supporting our "students first" mission by increasing fellowships for graduate students, scholarships for undergraduate students, and enhancing facilities and systems for experiential learning, among other initiatives.

We are immeasurably grateful and acknowledge our alumni, students and faculty for their unwavering commitment to excellence in their lives, in their careers and in the engineering profession.

In this issue of Exchange, we will bring relevance to the extraordinary – the excellence of our programs, institutional research, innovative curriculum and the outstanding accomplishments of our students, faculty and distinguished alumni

AHMET SELAMET

Professor & Chair

Department of Mechanical & Aerospace Engineering

Technical Elective Program

The Mechanical Engineering Undergraduate Program (ME) of the Ohio State University Department of Mechanical and Aerospace Engineering (MAE) is setting the standard for making program educational objectives relevant for our students. Students are seeing more value in their coursework through experiential learning in their sophomore year, in the expansion of the senior capstone experience and the redesign of laboratory courses, all instituted during the transition from quarters to semesters in 2012. Today, we are well-positioned to introduce the new Technical Elective (TE) Program to our first cohort of students who have experienced the redesigned curriculum as they complete their senior year.

“Engineers are problem-solvers,” said Dan Mendelsohn, associate professor, associate chair and chair of the ME Undergraduate Studies Committee. “Our goal is to educate graduates to be ethical, productive and contributing members of society, but also to give them the technical and professional skills and knowledge to excel in the engineering profession.”

It is also important that ME program graduates be prepared for success in engineering practice in industry, academia or government, or in a variety of other non-engineering careers such as law or public policy. “We want to ensure that our students are equipped to use their engineering background to help society, improve quality of life, and develop new products and knowledge to promote a sustainable economic environment,” Mendelsohn said.

Perhaps most important, students will have unique opportunities to function at a high level in modern engineering by acquiring lifelong professional skills not technically related to engineering, but critical for them to be competitive in today’s marketplace and successful in their careers. The new TE program will play an integral role in achieving these educational objectives.

GROUND-BREAKING CURRICULUM CHANGES

The first feature of the new program is the grouping of senior level elective courses based on the technical core of the curriculum in fluid/thermal systems, dynamic systems and control, mechanical and machine design, and nuclear engineering into three categories: design, computational/simulation and applications. This re-focus on engineering practice, versus a singular disciplinary approach, is designed to reinforce disciplinary aspects while showing students the benefits of applying their knowledge in a real-world and practice setting.

Design courses focus on processes used to design products, devices or systems to meet desired performance criteria. Key elements are the generation, evaluation, modeling and testing of multiple design options against multiple design outcomes. Computational/simulation-based courses involve the modeling and simulation of engineering problems using commercial or student-written software, and the assessment of the validity of computation results and simulations through comparison, with analytical solutions, estimates, experimental results or common sense checks.

An applications course applies basic engineering principles to the design and assessment of various devices which have broader societal impacts, such as energy and transportation systems, sustainable design and manufacturing, biomedical systems and clean water.

HONING PROFESSIONAL DEVELOPMENT SKILLS – A TOUGH SELL

The truly innovative aspect of the TE program is the addition of the fourth category of courses on professional skills, which sets ME’s program apart from its peers. Topics include public policy, society and technology, entrepreneurship and innovation, leadership and communications, project and systems management, new product design and introduction, Lean Six Sigma Manufacturing, humanitarian engineering, engineering law and economics.

“Adding professional skills to a traditional, purely technical curriculum was hard to justify to faculty at first,” said Mendelsohn, “I admit, I had to be convinced.” But after significant input from alumni and advisory board members who are practicing engineers in a variety of settings, and in joining the national discussion of preparing engineers for the 21st century, faculty were convinced that offering professional skills courses is an important step in training future engineers.



MAKING AN IMPACT IN ENGINEERING PRACTICE – AND ON OUR WORLD

According to the National Academy of Engineering (NAE), the century ahead poses formidable challenges for the engineering profession, from providing access to clean water, to securing cyberspace and making solar energy economical. Mendelsohn believes engineering students of this generation need the skills to address these issues, enumerated in the “NAE Grand Challenges,” many of which are inherently global and form the motivation for both the applications and professional skills categories.

The program requires 12 credit hours total; two courses from two of the three categories (design, computational, applications) for a minimum of six credit hours. The remaining credit hours may be chosen from pre-approved independent study courses, any course in the professional skills category, or select engineering and science courses outside the department.

“We’re taking small steps and if, as anticipated, the response to professional skills courses is positive, we will expand on the credit given in this important area,” said Mendelsohn.

A cross-disciplinary team of faculty leadership from academia, industry, government and private consulting are committed to changing the perception that technical expertise in traditional engineering is synonymous with the engineering profession when, in fact, the strength of engineering in great part is how engineers address real-world societal, environmental and other problems that affect quality of life.

“Engineers are certainly motivated by problem-solving,” Mendelsohn says, smiling. “But we want to equip our graduates with a broader vision – and the lifelong skills to change the world.” ✦

Turning theory into practice

Capstone programs by definition are “experiential” projects where students take what they have learned and apply it to a specific idea. Capstone projects give students the ability to utilize engineering knowledge and theory in a real-world setting. The rich diversity of capstone design projects is a major part of our revitalized curriculum, providing a unique opportunity for students completing their engineering education.

The various senior capstone project options for ME students teach the same engineering design fundamentals but differ in goals, technologies and types of projects. All projects have emphasis on design-prototype-test-report so students actually see how their ideas perform and how “ideation” and engineering analysis work to support design.

Students select one capstone project from five tracks following the first seven weeks in an introduction to design course. Tracks include student design competitions, industry sponsored projects, simulation-based design for high performance, humanitarian engineering projects, assistive devices, and a general projects version. “It’s a great way to learn to do design, not just talk about it,” says Associate Professor Anthony Luscher who teaches the general design capstone track. Students work on projects that apply mechanical engineering principles, “We want students to be engaged – and have fun,” Luscher said.

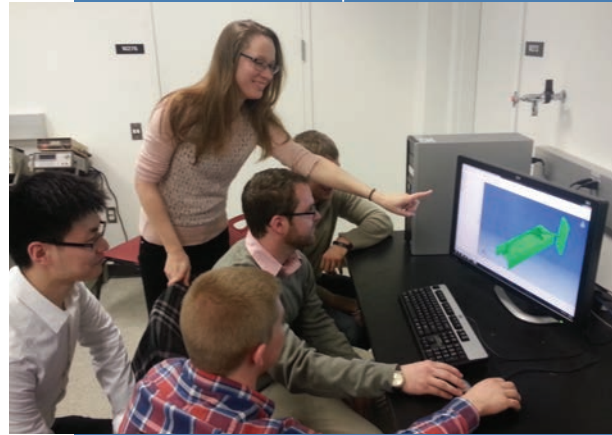
The industry-sponsored track projects come from actual needs of the sponsoring company and are scoped such that the goals can be met within the academic year time frame. The simulation-based design track grew out of such a sponsorship. The humanitarian project track is set aside for products or systems designed to meet the needs of particular populations in underdeveloped countries such as clean water, affordable stoves and fuels, and local, renewable energy.

Associate Clinical Professor Shawn Midlam-Mohler teaches the design competition capstone track. “These projects are high stakes, real-world, team-based and getting to the deliverables is intense,” he said. One such project comes from the Venturi Buckeye Bullet team, pushing the envelope of

electric vehicle technology to change public perception of electric vehicles and support green technologies of the future. “We’re giving students hands-on experience that mirrors what happens in industry,” says Midlam-Mohler.

The simulation-based design for high performance capstone gives students experience in the experimental and computational aspects of noise, vibration and harshness (NVH) and structural dynamics while studying an industry-driven problem. Initially funded by the General Motors (GM) Foundation, the project was conceived by Professor Rajendra Singh and Karen Morely of GM. The pilot included 18 students under the supervision of Dr. Jason Dreyer and Dr. Scott Noll and two GM industry “mentors.” The project presented a real-world problem studied during automotive design allowing students to identify where NVH issues would arise in the steering wheel column. Students successfully presented their final reports to the GM team. “Employers have a need for people with this skill set,” said Dreyer. Rich Eckenrode, a graduating senior in the course last year noted, “The project was a major talking point during my interview with Ford and ultimately led to a job offer.” The project was so successful that a separate track has been added and will continue with or without specific industry-sponsored projects.

Sandra Metzler, assistant clinical professor, teaches the rehabilitation engineering senior capstone in assistive devices — integrated with biomedical and mechanical engineering. “Projects vary widely,” Metzler said. “There’s a synergy between the teams.” Each project team has an engineering and clinical/medical advisor and students have the opportunity to work in a medical environment on current real-world problems. Projects are unique, proposed by



GM Mentor Rene Kreis meets with ME Capstone Design students to review their computational models of a designed test stand to characterize the dynamic properties of a ball bearing, motivated by a steering wheel “shake” phenomenon.



a variety of sponsors including Ohio State’s Wexner Medical Center, NASA and manufacturers of assistive devices. One project, a patient lift sling device, incorporates design of a more secure, comfortable and supportive sling for patient transfer. “Students literally go into the clinical setting and get feedback on their device,” Metzler said. “They have an opportunity to make a difference, learning design in the process.”

Two additional full year capstone program options are also available to our students. One is aimed at product design as opposed to engineering design and has a strong emphasis on customer needs and potential markets. According to Associate Professor Blaine Lilly, product ideas are taken from the initial conceptualization stage to a patent-ready prototype at the end of spring semester. “Students are expected to do extensive fieldwork and design research up front, and build several prototypes over the course of the two-semester sequence.” The other option is a multidisciplinary and industry-sponsored capstone design course taught by the College of Engineering, with project teams comprised of several engineering majors and business students. ✚

EXPERIENTIAL LEARNING

A hallmark of MAE's undergraduate program is its multi-faceted capstone design projects, prime examples of experiential or applied learning in the classroom, defined as "learning through reflection on doing." However, design projects are not confined to the senior year. Sophomores gain understanding of the major interest areas and typical problems encountered in the mechanical engineering discipline through a combination of classroom and hands-on laboratory experiences centered on the manufacturing and control of a compressed air motor, as well as an open-ended mechatronic design project.

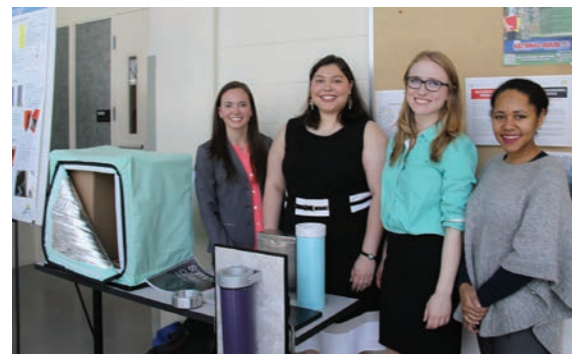
Juniors learn the fundamental principles of selected machine elements such as linkages, fasteners, springs and gears in the classroom and culminate the two semester series with a paper-based design project, which this year involved designing educational exhibits appropriate for Columbus' Center of Science and Industry (COSI).

Prior to this year, there was little opportunity for students or faculty to see these examples of design across the curriculum. In early 2015, several faculty discussed potential remedies which grew into the idea of a "Design Day" where students could showcase their projects to other students, faculty, staff, visiting advisory board members, companies and the general public. As a result, last April, dozens of student design teams lined the halls of Scott Lab, eager to share examples of their work ranging from Arduino-controlled air motors to spring-loaded basketball-shooting cannons to receptacles for feminine care products.

In its first year, Design Day was a big hit. "Students work really hard on their projects," said Rob Siston, associate professor, who originally came up with the idea. "It's a chance for them to show what they can do." Students appreciated the day as well. "Design Day was a great opportunity for us as third year students to showcase our machine elements projects and preview what we will experience next year in capstone," said Mitch Eichler, a junior in mechanical engineering.

Faculty supported Design Day by encouraging students to participate in conversation and in their classes. As "experimentalists," their goal was to evaluate what worked this year and make next year's event bigger and better. Preliminary plans for next year include adding projects from two popular classes taken by seniors as technical electives, or by master's students; one on product design engineering and the other on computer-aided design and manufacturing. Faculty want to spread the word about the event and engage outside audiences such as college freshman who may be undecided about engineering, high school students who have a budding interest in engineering and companies who may be looking for summer interns or potential employees, or who may have interest in sponsoring a capstone design project.

"Design Day was a celebration of our students' innovation that exemplifies the philosophy of hands-on learning," Siston commented. "We are passionate about inspiring our students to make an impact," he said. ✨





SAVE THE DATE!
JOIN FACULTY, STAFF AND STUDENTS FOR
DESIGN DAY ON APRIL 22, 2016

2015 Alumni, Teaching AND Student Awards

The Department of Mechanical and Aerospace Engineering honored the accomplishments of alumni, faculty and current students on April 24, 2015 at the annual Honors and Awards Ceremony.

Alumni Awards

The **E.G. Bailey Entrepreneurship Award** was presented to **Dr. Paritosh Ambekar**. The award is presented to alumni who have invented new products, processes or procedures that have been successfully manufactured, adapted or utilized.

Ambekar is an expert in the health care industry with specific focus on developing



Jeff Ficke and
Dr. Paritosh Ambekar

countries. His primary experience is in strategic and tactical aspects of product development, implementation of new business models and entrepreneurial ventures. Trained in the start-up world, he is currently a senior global marketing manager at Varian Medical Systems, Inc. in Palo Alto, California, in the field of radiation oncology, where he heads the product marketing of a multibillion-dollar program focused solely on developing countries. Previously, he served as marketing manager at Hansen Medical in the field of Peripheral Vascular Disease. Before Hansen, he worked at two California based start-ups, Pivot Medical and Novare Surgical Systems, in the field of minimally invasive surgery. Early in his career, Ambekar was instrumental in solving technical challenges of two NASA space programs and is the author of a book titled *Cryogenic Test-bed and Capacitive Sensors for NASA Spacecraft*. He earned his master's degree in 2002 in mechanical engineering from The Ohio State University, has a PhD in mechanical engineering from Stanford University, and an MS in management from Stanford Graduate School of Business. His

entrepreneurial activity includes product development such as a new Linear Accelerator for the under-privileged populations in developing countries to fight the cancer pandemic in the poorest nations in the world – an “intra-preneurial” venture in a medical device Fortune 1000 company. Once reprimanded for being “too entrepreneurial,” Ambekar is on a mission to improve care for under-privileged patients around the globe. ✦

Donald E. Luebrecht was named the recipient of the **Loofbourrow Business Achievement Award**, presented to alumni who have been recognized for their significant contributions in guiding a successful product or service business, major industrial organization or government entity.

Luebrecht earned his bachelor's degree in mechanical engineering from The Ohio State University in 1970. His distinguished career with Crown Equipment Corporation spanned more than three decades until his retirement in 2010. He exemplified Crown Equipment Corporation's exceptional reputation for excellent product design, engineering and manufacturing of its global, award-winning line of electric lift trucks. He lived the company's brand promise of superior value and customer service. Luebrecht is an innovator and inventor who has developed new products for worldwide markets in lifting

and moving with numerous patents for product design and materials handling equipment. At Crown Equipment Corporation, he created and implemented a modern engineering department based on modern design standards, instituted lean manufacturing principles and was responsible for expanding Crown Equipment Corporation globally, while molding a dedicated team of engineering professionals. He is the recipient of many design awards for product excellence in the United States and Europe, as well as state awards for environmental performance in manufacturing. Luebrecht is a member of the Industrial Truck Association, has stayed active in Ohio State's engineering research funding for gear design and manufacturing, and serves on Crown Equipment Corporation's Board of Trustees. ✦

The **Ralph Boyer Young Achiever Award** was presented to **Chris Bush**. The award is presented to alumni who have risen rapidly in their chosen profession and made significant contributions before the age of 40.

Bush is a 2001 graduate of The Ohio State University. After earning a bachelor of science degree in mechanical engineering and a master's degree from the University of Southern California, he began his career as a lead field engineer at the Valley Station Repowering Project in Sun Valley, California. In October 2004, he joined Parsons Government Services Worldwide. Driven to succeed at an early age, he has spent more than 13 years of progressive experience in the engineering and construction industry with emphasis on construction management on a multitude of capital improvement programs. He oversees development of business opportunities internationally with a focus on



Darrel Kohlhorst and Donald Luebrecht



Dr. Chia-Hsiang Menq and Dr. Hong-Tzong Yau

the Middle East and Africa. He is a self-motivated team leader who specializes in mentorship, management and teamwork. Bush is also skilled in managing design phase, post-construction operations, maintenance and training of personnel in a variety of tasks. He brings unparalleled leadership and proficiency in all aspects of construction programs. He is a graduate of the Parsons General Management Acceleration Program and has completed an 18-month assignment on the Parsons Corporate Leadership Council. He is a Parsons Certified Project Manager, a Construction Management Association of America Certified Construction Manager and a dedicated leader in all facets of the design and construction industry. ✨

The **Thomas French Award** recipient was **Dr. Hong-Tzong Yau**, presented to a mechanical engineering alumnus who has distinguished himself or herself as an educator.

Yau is a professor of mechanical engineering and director of Precision Molding Center at the National Chung Cheng University, Chia-Yi, Taiwan. He received his MS and PhD degrees from The Ohio State University in 1988 and 1991, respectively. He was recruited by Cummins Engine upon graduation as a senior research engineer. He later joined the National Chung Cheng University in 1994. His research interests include precision engineering, customized CAD/CAM/CNC systems, digital dentistry and additive manufacturing. He holds 40 patents and has published 110 peer-reviewed international journal and conference papers. Early in his career, Yau was devoted to the development of customized CAD/CAM systems. He has assisted many world leading manufacturers, including sports footwear giant Nike and the world's largest shoe manufacturer Pouchen Group, as well as machine tool companies, improving their product quality and production efficiency. In recent years, by integrating medical



Alumni Award Honorees and Presenters

imaging, customized CAD/CAM, 5-axis and 3D printing, Yau has developed advanced digital dental solutions in dental implants and orthodontics. As a result, \$20M was secured to set up Total Dental Solutions, a Taiwan-based bio-tech company that has sold his systems and products to more than 20 countries worldwide. Currently, Yau is collaborating with Taiwan electronics companies to develop innovative 3D printing systems for dental implant and orthodontics applications, expected to further impact the digital dentistry world. ✨



Doug Ball and Dr. Gerald Gregorek

Dr. Gerald M. Gregorek was awarded the **Garvin L. Von Eschen Award**, given to an alumnus who has demonstrated the technical and administrative excellence to lead successful aerospace projects and organizations.

Gregorek earned his bachelor's degree, master's degree and his PhD in aerospace engineering from The Ohio State University. His teaching innovations include an air vehicle design course that was one of the first to replicate industry preliminary design teams by forming students into design teams focused on satisfying the specifications of a particular aircraft. Working with OSU's Aviation Department, Gregorek developed a flight



Department Chair Ahmet Selamet with Ralph and Barbara Rockow

research course for senior and graduate students that employs a university aircraft and basic instrumentation to evaluate the performance, stability and control of a typical general aviation aircraft. His aerodynamics research has spanned the flight regime from hypersonic to low speed and his early work in hypersonics included assisting in the design and initial operation of the Air Force Aeronautical Research Laboratory's Twenty-Inch Hypersonic Wind Tunnel. In the OSU Aeronautical and Astronautical Research Lab he has conducted experiments and developed specialized instrumentation for measurements of forces, heat transfer, low density and unsteady pressures – setting the bar for research being conducted today. His flight research with general aviation aircraft includes evaluation of new wing airfoil designs, aero-acoustic propellers, post-stall departures, and the determination of the overall aircraft drag and the detailed wing characteristics of the Bellanca Skyrocket II – a prototype all-composite aircraft of high aerodynamic efficiency. ✨



His aerodynamics research has spanned the flight regime from hypersonic to low speed and his early work in hypersonics included assisting in the design and initial operation of the Air Force Aeronautical Research Laboratory's Twenty-Inch Hypersonic Wind Tunnel.



Phil Combs and Dr. Eric Rice

Dr. Eric Rice was the recipient of the **Rudolph Edse Award**, presented to an aerospace alumnus who has demonstrated excellence in space engineering and science.

Rice is chief executive officer and chairman of the board of Orbital Technologies Corporation, a high-tech aerospace company headquartered in Madison, Wisconsin. He has led the expansion of the company into a major force in the aerospace community for over 26 years in areas of advanced vortex and hybrid rocket propulsion, microgravity processing, space resource utilization, and advanced life support and human systems. He has been involved in Orbital Technology's technical developments, including advanced propellants and propulsion rocket engines, and vehicles for future space transport systems and space platforms, and advanced research on the processing of Lunar materials for use on the Moon. As the company's key executive, Rice's wisdom and talent continue guiding and managing the growth of the company over a wide variety of research areas. Previously, he undertook the Directorship for Aeronautics Technology Center, Aeronautics Corporation of America, and with his talents and leadership the center won more than \$7M in space R&D contracts and established an industry task force leading to the successful award of a NASA Center for the Commercial Development of Space – the Wisconsin Center for Automation and Robotics (WCSAR). At Battelle, Rice was responsible for space systems activities. A career highlight was his management of a large multidisciplinary project involving the disposal of commercial nuclear waste in space – he developed Battelle's long-range plan for the program. He is a Fellow of the American Institute of Aeronautics and Astronautics (AIAA) and led the development of an AIAA position paper on the direction of the American Space Program for the Corporate Member Committee. He is also a Fellow with NASA's Innovative Advanced Concepts and leads industry activities of the Wisconsin Space Grant Consortium. He continues serving on the Space Grant Advisory Board and as a member of Ohio State's Aerospace Engineering Industrial Advisory Group. Rice earned his PhD in aeronautical and astronautical engineering from Ohio State and, notably, coached the Buckeyes in the Woody Hayes era. ✨



Dr. K. (Cheena) Srinivasan and Dr. Dennis Guenther

The **Stillman Robinson Lifetime Achievement Award** was presented to **Dr. Dennis A. Guenther**. The award is presented to retired or emeritus alumni who have distinguished themselves over their lifetimes in their chosen professions.

In the words of his nominators, "Dennis has dedicated his career to the development of products and procedures to benefit humankind..." He is a professor emeritus of The Ohio State University. His 32-year tenure in the Department of Mechanical and Aerospace Engineering allowed him to

touch the lives of thousands of students, and because of his teaching excellence he was awarded the College of Engineering MacQuigg Award for outstanding teaching, the department's Teaching Excellence Award and Ohio State's Alumni Award for Distinguished Teaching. His role as an educator affected the attitudes and ethics of many future engineers. His interest in cars, trucks and other modes of transportation enabled him to develop undergraduate and graduate courses in vehicle design, handling, stability and vehicle safety. He advised over

one hundred master's students and PhD candidates whose careers have since impacted the transportation industry. In the private sector, his innovation and leadership at SEA Limited resulted in the development of numerous products, as well as the growth and expansion of SEA as a world leader in engineering consulting and scientific analysis. Guenther used SEA to develop and commercialize products such as the Vehicle Inertial Measurement Facility, considered the industry standard for measuring vehicle inertial parameters. Throughout his career, he has leveraged his role as an industry leader with his ties to education and research at Ohio State for the mutual benefit of industry and academia -- as well as countless engineering graduate students. Guenther has accomplished innovation on many levels as an educator, corporate leader and in making research relevant to change the world. ✨



"Dennis has dedicated his career to the development of products and procedures to benefit humankind..."



Kyle Korn, Dr. K. (Cheena) Srinivasan and Alex Pax



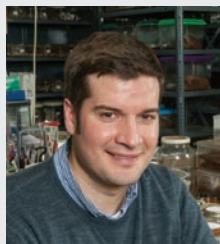
Maura O'Neill



Derek Recker

Teaching and Graduate Teaching Awards

The **Pi Tau Sigma Above and Beyond Award** was presented to **Professor K. (Cheena) Srinivasan** by Pi Tau Sigma President Kyle Korn and Vice President Alex Pax. The **Undergraduate Teaching Award** recipient was **Maura O'Neill**, presented by Associate Professor and Associate Chair Dan Mendelsohn. The **Graduate Teaching Associate Award** recipient was **Derek Recker**, also presented by Dan Mendelsohn.



Assistant Professor Carlos Castro



Professor Ahmet Kahraman

On May 22, 2015, **The Michael J. Moran Award** for Excellence in Teaching was presented to **Assistant Professor Carlos Castro**, by Pete Miller, Mechanical Engineering (ME) Program External Advisory Board (EAB) Member. The award recognizes a deserving faculty member who excels at undergraduate teaching, named in honor of Emeritus Professor Michael Moran. **The Distinguished Graduate Faculty Award** was presented to **Professor Ahmet Kahraman** by ME EAB Member Lynn Faulkner for an exemplary record of graduate student advising. The award recognizes faculty who consistently contribute as outstanding teachers and mentors of graduate students. ✨

STUDENT AWARDS

Outstanding Research Awards were presented by Assistant Professor Marcello Canova, Assistant Clinical Professor Jason Dreyer and Professor and Ohio Eminent Scholar Joseph Heremans.

Recipients: Polina Brodsky, Joel Bruns and Chao Xu

Top Academic Awards were presented by Associate Professor Blaine Lilly (mechanical) and Assistant Clinical Professor Clifford Whitfield (aerospace).

Mechanical Engineering Recipients:

Freshmen: **Keith Altman, Jack Chen, Mary Carson, James Gaydos, Sean Lincoln, Adam Merk, Clint Teece, Jiashuo Tong, Mark Verosky, Brett Whitford**
 Sophomore: **Peter Bonavita**
 Juniors: **Bryan Martin, Brian Rice**

Aerospace Engineering Recipients:

Freshman: **Marc-Antoine Blais Belanger**
 Sophomore: **Bryan Kolpitcke**
 Junior: **Kyle Hochevar**
 Senior: **Matthew Long**



Peter Worley

The Rob Wolf Outstanding Senior Award

is presented to a senior mechanical engineering student in memory of Rob Wolf, a 1997 graduate. The award recognizes students who excel academically while taking an active role in department, college, university or community organizations. Finalists were **Nicholas Peterson, Thomas Ziebro and Peter Worley**. The award was presented to **Peter Worley** by Associate Professor and Associate Chair Dan Mendelsohn. ✨



Polina Brodsky



Keith Altman



Mary Carson



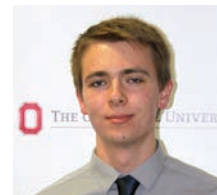
James Gaydos



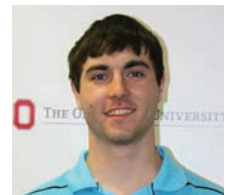
Sean Lincoln



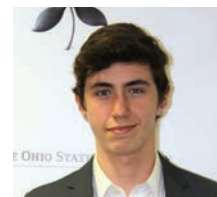
Adam Merk



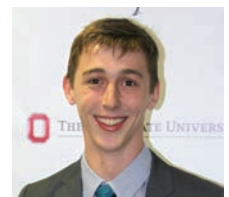
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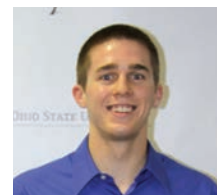
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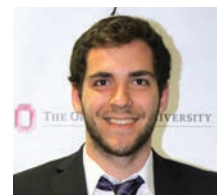
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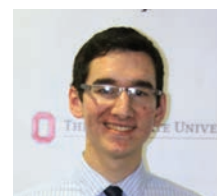
Brian Rice



Marc Blais Belanger



Bryan Kolpitcke



Kyle Hochevar



Matthew Long

STUDENT SUCCESS



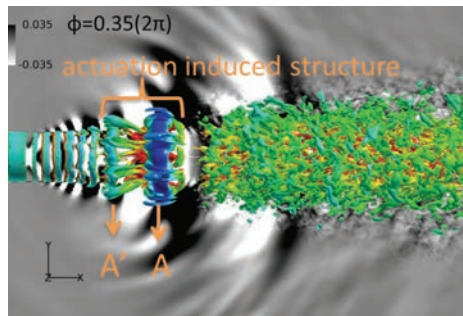
Ohio State's EcoCAR 3 Team Wins Year One of Advanced Vehicle Technology Competition

EcoCAR 3, a four-year student competition to reengineer a 2016 Chevrolet Camaro into a performance hybrid, concluded Year One with an award ceremony in June following five days of presentations. The Ohio State University's EcoCAR topped 15 other teams from universities across the United States and Canada to achieve the first place finish. This is the second victory for Ohio State in two years.

In August 2014, students began working on the design of their Camaro in preparation for competition. The team used modeling, simulation and design tools from industry in order to complete year one goals such as architecture selection and the initialization of critical vehicle controls software. Extensive consumer market research was conducted in central Ohio to guide vehicle design and the team was heavily involved in outreach efforts.

The team spent five days giving technical presentations on the redesign plans for the vehicle's mechanical and electrical systems, as well as comprehensive presentations covering project management and outreach. They placed in the top five for 27 of 31 scored events, including six first place and three second place finishes. The team took first place in a dSPACE sponsored award and third place in a MathWorks sponsored award.

The first place win earns the team a trophy and \$10,000 to be used for the continued development of the Ohio State EcoCAR Camaro. Additional prize money was earned through top three finishes in the awards categories. The team's advisor is Associate Clinical Professor Shawn Midlam-Mohler. ✚



Speth and Gaitonde Receive 2015 ASME Robert T. Knapp Award

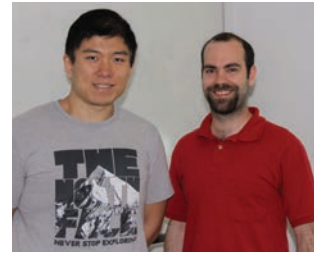
Rachelle Speth, PhD student, and Professor Datta Gaitonde, MAE, received the American Society of Mechanical Engineers (ASME) 2015 Robert T. Knapp Award recognizing their paper titled, "Near Field Pressure and Associated Coherent Structures of Excited Jets." The award is presented for an outstanding original paper resulting directly from analytical or laboratory research.

Speth received her BS (2010) and MS (2012) degrees in aerospace engineering from Ohio State and is currently pursuing her PhD in aerospace engineering. Her research, supported by the Air Force Office of Scientific Research, concentrates on understanding and controlling large scale structures and noise created by high speed commercial and military jets.

Professor Datta Gaitonde holds the John Glenn Chair and is an Ohio Research Scholar. He directs the High-Fidelity Computational Multi-Physics Lab (HFCMPL) where focus is on jet noise, shock interactions, flow control and scramjet flowpaths. Gaitonde is deputy editor of the American Institute of Aeronautics and Astronautics (AIAA) Journal and a Fellow of the Wright-Patterson Air Force Research Laboratory (AFRL), AIAA and ASME. ✚

Zeng and Fredette Awarded Leo Beranek Student Medal for Excellence in Noise Control Studies

Xianpai Zeng, undergraduate student, and Luke Fredette, graduate student in MAE, were awarded the 2015 Leo Beranek Student Medal for Excellence in the Study of Noise Control by the Institute of Noise Control Engineering of the United States of America (INCE/USA).



The medal was established in 2010 by the Board of Directors of INCE/USA to recognize excellence in the study of noise control by undergraduate and graduate students who have coursework in or related to noise control engineering, including practical applications. Ohio State has received 10 awards since 2011.

Candidates are selected by their academic institution and nominated by a faculty member. Zeng and Fredette were nominated by Professor Rajendra Singh, MAE Faculty Emeritus.

The medal is named for Professor Leo Beranek, an American acoustics expert, former MIT professor, and a founder and former president of Bolt, Beranek and Newman, who assisted in the creation of ARPAnet, which eventually became today's internet. ✚

Engineering Students Take Business Plans to the Next Level

Following in the footsteps of engineering students and faculty before them, two teams led by Buckeye engineers took top honors at the 2015 Ohio State Business Plan Competition.

Hosted by the Technology Entrepreneurship and Commercialization Institute at Fisher College of Business, the competition looks at new technologies with the potential to create a business and positively affect a range of areas and industries. It aims to stimulate and nourish the entrepreneurial spirit in Ohio State University students.

Open-track winner Nikola Labs won \$15,000 and the \$2,000 Clean Energy Award, sponsored by the university's Office of Energy and the Environment. The team plans to charge wireless devices by harvesting the energy transmitted during data and voice communications as well as during Wi-Fi connectivity. Winning the undergraduate track

and \$5,000 was the GoDesk, a portable workstation capable of charging any USB device and supporting more than 30 pounds.

Team members are **Travis Jones**, mechanical engineering graduate student and team leader of Nikola Labs; Chi-Chih Chen, research associate professor of electrical and computer engineering; mechanical engineering student **Pareekshith Allu**; Electrical and Computer Engineering Assistant Clinical Professor Wladimiro Villarroel. Mentors are John Bair, executive director of Ohio State's Center for Design and Manufacturing Excellence, and Will Zell, entrepreneur and co-founder of Nikola Labs LLC. ✨



two rounds; the first an on-campus round in which the winner would receive travel accommodations to General Motors' global headquarters for round two, where a mini-innovation challenge took place on site as part of the final presentation. In the final round, teams would present their winning idea along with the mini-challenge to a larger panel of judges to determine the ultimate winner.

Brian Bachir (2nd year ME), **Geoff Hardy** (2nd year, Finance), **Abed Traboulsi** (2nd year BME) and Beal began a brainstorming session after the challenge's information session in late March. The team focused on formulating an idea that would assist GM in achieving its sustainability and renewable energy goals. Following extensive research and conceptualization, the team proposed an energy harvesting solution that would minimize GM's carbon footprint and potentially impact the future sustainability of manufacturing. The team was selected as the winner of the Ohio State on-campus round.

The team traveled to GM's global headquarters in Detroit to participate in a mini-case study and present in the final round against the winners of the on-campus rounds from Michigan, Michigan State, Virginia Tech and Penn State. They presented a conceptual company that would assist in transporting people to and from everyday activities

and were selected as winner of the mini-case study. The following day the team presented in the competition's final round and were selected as the overall winners. As GM Innovation Challenge champions, the team received \$1,500 and internship offers for summer 2016. ✨

ME Students and Teammates Win 2015 GM Innovation Challenge

When **Patrick Beal**, second year mechanical engineering student, heard about the 2015 GM

Innovation Challenge last March, he wasted no time assembling a creative team to enter the competition. The goal was to develop and present quick and cost-effective ways of incorporating new and rapidly advancing technologies into existing manufacturing facilities. This was the second year that GM held the challenge and the first year it took place at Ohio State.

Each team was to select one topic and present a conceptualized product, process, method or methodology for use in vehicle manufacturing. The competition consisted of

The goal was to develop and present quick and cost-effective ways of incorporating new and rapidly advancing technologies into existing manufacturing facilities.



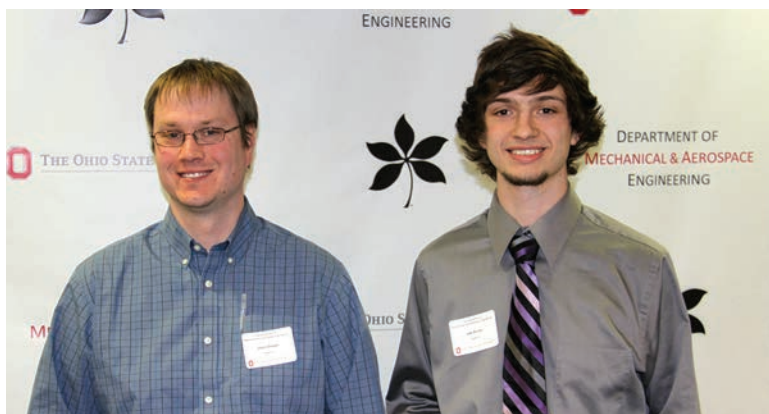
Javor Wins Prestigious Pelotonia Undergraduate Fellowship

Josh Javor, an undergraduate student in MAE, received a 2015 Pelotonia Undergraduate Fellowship, the first undergraduate student from MAE to receive the fellowship. Pelotonia, the grassroots bike tour that raises money to fund cancer research, raised a record \$21M in 2014.

Javor, a mechanical engineering student, has aspirations to apply his mechanical engineering background to health and the biological sciences. He was inspired to apply for the Pelotonia fellowship because cancer has touched his family personally.

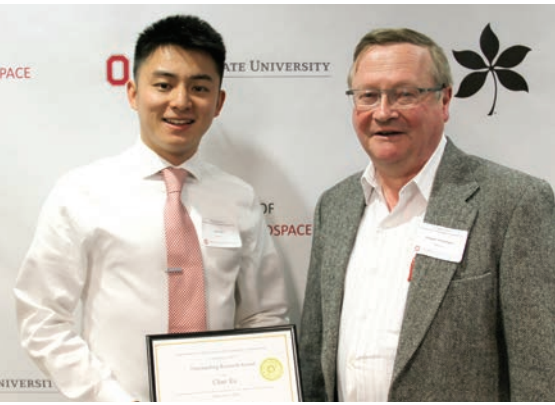
Javor's research is focused on cancer detection by using a modified detection method, eddy current detection, currently used in welding to identify defects in conductive materials such as metals. His fellowship project applies similar technology to detect abnormalities in human tissue by designing and fabricating a microscopic detection tool based on macroscopic prototypes to improve resolution.

Last year, Javor rode 180 miles in Pelotonia, his first cycling event. As part of the fellowship program this summer, he will compete as a student rider on Team Buckeye to help reach his fundraising goal. Javor is advised by Professor Vish Subramaniam. ✨



Dr. Jason Dreyer (left) with Outstanding Research Award Winner Joel Bruns at the 2015 Honors and Awards Ceremony

STUDENT SUCCESS



Chao Xu and Dr. Joseph Heremans

Xu, Worley and Bennett Earn First, Second and Third Place Awards at Denman

Three of the first, second and third place awards within the engineering competition category of the 2015 Denman Undergraduate Research Forum were earned by mechanical engineering students.

Chao Xu's presentation, "Investigating a new approach for harvesting low-grade thermal energy using an electrochemical system," earned top honors. Xu is advised by Joseph Heremans who describes Xu as an exceptional student.

Peter Worley's presentation, "Heat water with wind: direct energy conversion of mechanical energy to heat using eddy currents," won second place and **Molly Bennett's** presentation, "Engineering a testing system for nanofluidic pressure-to-potential devices," placed third. Worley is advised by Professor Vish Subramaniam and Bennett's advisor is Assistant Professor Shaurya Prakash.

More than 600 Ohio State students in all disciplines presented their work in 11 categories and multiple subcategories at this year's 20th Annual Richard J. and Martha D. Denman Undergraduate Research Forum, held in the Recreation & Physical Activities Center (RPAC).

The forum is one of the largest events of its kind in the country and has been an academic tradition at Ohio State for 20 years. ✚



Gaitonde says Adler's creativity, intelligence and intensity is among the top one percent of students he has worked with in his career.

PhD Student Michael Adler Receives 2015 National Defense Science and Engineering Graduate (NDSEG) Fellowship

Michael Adler, PhD student, has been awarded a 2015 National Defense Science and Engineering Graduate (NDSEG) Fellowship, sponsored and funded by the Department of Defense (DoD).

To increase the number of U.S. citizens and nationals trained in science and engineering disciplines of military importance, DoD awarded approximately 200 new three-year graduate fellowships in April 2015. The fellowship is offered to individuals who have demonstrated the ability and special aptitude for advanced training in science and engineering, and who will pursue a doctoral degree in, or closely related to, an area of DoD interest within one of fifteen disciplines, including aeronautical and astronautical engineering.

Michael Adler joined MAE's PhD program in aerospace engineering in fall 2014, working in the High-Fidelity Computational Multi-Physics Laboratory. He is advised by Professor Datta Gaitonde.

Adler comes to Ohio State from Michigan Tech where his focus was computational fluid dynamics involving atmospheric physics as well as scramjet combustion. His area of study is interactions of shock waves with turbulent boundary layers (SBLI) utilizing massively parallel supercomputers operated by DoD to perform high fidelity simulations.

His work focuses specifically on understanding the physics of SBLI unsteadiness in three dimensional SBLI configurations important to the dynamics of supersonic jet inlets, control surfaces and scramjets. Gaitonde says Adler's creativity, intelligence and intensity is among the top one percent of students he has worked with in his career. ✚

Papageorge, Disotell and Dong Awarded Prestigious Presidential Fellowship

Michael Papageorge, graduate student in MAE, received a Spring 2015 Presidential Fellowship awarded by The Ohio State University Graduate School. The Presidential Fellowship is the most prestigious award given by the Graduate School, recognizing the outstanding scholarly accomplishments and potential of graduate students entering the final phase of their dissertation research or terminal degree project.

Papageorge received his BS degree in mechanical and aerospace engineering from Princeton University. His research focuses on the development of advanced laser diagnostic systems for combustion and turbulence, and the application of these systems to study turbulent flows. His work began with the construction of a one-of-a-kind laser system which allows flow measurements to be collected with high resolution in both space and time. Using this system, Papageorge has taken measurements in a wide range of both reacting and non-reacting environments which have elucidated new insights to related physical mechanisms. Papageorge is advised by Associate Professor Jeffrey Sutton.



Kevin Disotell and **Sheng Dong**, also graduate students in MAE, received the Autumn 2014 Presidential Fellowship.

Disotell received his BS degree in aerospace engineering from Ohio State with highest honors. He is currently funded by a National Science Foundation Graduate Research Fellowship and was previously a National Defense Science and Engineering Graduate Fellow selected by the U.S. Army Research Office. His research focuses on characterization of detached air flows over aerodynamic surfaces, which limit the performance of ground and air vehicles. His experience ranges from optical measurement of surface pressure on rotating helicopter and wind turbine blades, to understanding the formation of three-dimensional cell patterns in highly separated flows. Disotell is advised by Associate Professor James Gregory.

Sheng Dong received a BS degree in civil engineering from Southeast University, Nanjing, China, and earned a MS degree in bridge engineering from Tongji University, Shanghai, China. His research focuses on ultrasonic lubrication, which utilizes ultrasonic vibrations to reduce friction and wear between sliding surfaces. His work has clarified key principles that enable ultrasonic lubrication, and through innovative experiments and modeling, has quantified the phenomenon for a range of material combinations, speeds and forces, making it possible to design systems that take advantage of ultrasonic lubrication in industrial applications.

Dong's advisor is Professor Marcelo Dapino, Honda R & D Americas Designated Chair in Engineering, Fellow of the American Society of Mechanical Engineers, Senior Fellow with Ohio State's Center for Automotive Research, and Associate Director for Research of the National Science Foundation I/UCRC on Smart Vehicle Concepts. ✦



Connolly Earns American Indian Science and Engineering Society Technical Excellence Award

Aerospace Engineering Graduate Student **Joseph Connolly** received the 2014 American Indian Science and Engineering Society (AISES) Technical Excellence Award.

The award is given annually to an American Indian/Alaska native for making a significant contribution to science, engineering or technology by having designed, developed, managed or assisted in the development of a product, service, system or intellectual property. Connolly is advised by Associate Professor Jack McNamara.

Connolly is a member of the Haudenosaunee of the Onondaga Nation-Wolf Clan from Six Nations Reserve of the Grand River. He is employed as a Controls Engineer for NASA Glenn Research Center and is working toward his PhD degree.

Nominees for the Technical Excellence Award are evaluated on the uniqueness of his/her research; degree of impact work has on humankind; patents or published works; potential as a role model; and demonstrated involvement with American Indian or Alaskan Native community.

In addition, Connolly recently received an American Society of Mechanical Engineers (ASME) Best Paper Award by the ASME Aerospace Division, Propulsion Technical Committee. The paper entitled, "Model-Based Control of a Nonlinear Aircraft Engine Simulation using an Optimal Tuner Kalman Filter Approach," was co-authored by Connolly, Jeffery Csank, Amy Chicatelli and Jacob Kilver. The work presented in the paper was supported by the Aeronautical Sciences Project under the Fundamental Aeronautics Program. ✦

Reinke Appointed 2016 American Nuclear Society (ANS) Congressional Fellow

Benjamin Reinke has been appointed as a 2016 American Nuclear Society (ANS) Congressional Fellow, part of a cohort of American Academy for the Advancement of Science (AAAS) Fellows. Reinke will work as staff to a house member, senate or congressional committee in Washington, D.C. to further nuclear and science public policy at the national level and to contribute to the federal policymaking process. He is the second candidate from Ohio State to be appointed an ANS Congressional Fellow.

Following a rigorous application process, candidates were interviewed in person by a selection committee during the ANS annual meeting in June. Selection criteria include competence in nuclear science and technology; demonstrated ability to participate in public policy discussions; demonstrated ability in written and oral communications and making significant contributions to ANS.



Reinke, a fifth-year graduate student and PhD candidate in nuclear engineering, received his bachelor's degree from Ohio State with a double major in physics and French. He is a NASA Space Technology Research Fellow studying radiation damage at cryogenic temperatures. Specifically, he is developing an experimental cryogenic irradiation facility at Ohio State's Nuclear Reactor Laboratory to conduct *in situ* cryogenic radiation damage and low temperature annealing experiments in optical and electrical materials.

Reinke is one of nearly 30 scientists and engineers participating annually through the AAAS Congressional Science and Engineering Fellowship Program. More than 2,000 individuals have served as fellows on Capitol Hill since the inception of the AAAS program in 1973. The ANS Congressional Fellowship Program began in 2000 and runs from January through December each year. ANS encourages members to apply to experience the inner workings of Congress and contribute to improving understanding about nuclear issues among congressional leaders.

ANS is a not-for-profit, international, scientific and educational organization established to unify professional activities within the nuclear science and technology fields. ✦

The Graduate School awards approximately 15 Presidential Fellowships each semester for outstanding academic achievement. The fellowship provides financial support so that each Presidential Fellow may devote one year of full-time study to the completion of his or her dissertation or degree project unimpeded by other duties. Competitions are held fall and spring semesters.

FACULTY RECOGNITION



Ohio Eminent Scholar Bharat Bhushan Influences Engineers to Engage in Public Policymaking in Washington

Department of Mechanical and Aerospace Engineering Professor Bharat Bhushan is leveraging his time on Capitol Hill as a Science and Technology Policy Fellow, part of the ASME Congressional Fellows Program, to let the engineering and science professions know they can have an impact on public policymaking.

Bhushan, who served on the Republican staff of the Committee on Science, Space and Technology (SST) in the House of Representatives for one year, talks about his life-changing experience as a Congressional Fellow in an article, “Laboratories of Policy,” featured in the June 2015 issue of Mechanical Engineering magazine.

An Ohio Eminent Scholar and The Howard D. Winbigger Professor, Director of Nanoprobe Laboratory for Bio & Nanotechnology and Biomimetics, and Affiliated Faculty Member at The John Glenn School of Public Affairs, Bhushan is living proof that engineers can use their science and technology expertise to influence legislation by being champions for science policy. In the article, Bhushan says, “Engineers cannot remain outside the political process. Their expertise is needed to ensure that technical policy is crafted to do the most good.”

Bhushan is leading by example. In Washington, he prepared the subcommittee

for hearings on major bills, prepared hearing requests and assisted in the preparation of legislation, seeing some pieces of landmark legislation passed even in a difficult political climate.

He participated in the Frontiers in Innovative Research, Science and Technology Act, intended to reauthorize funding for various science agencies and programs. He also worked on the Revitalize American Manufacturing and Innovation Act of 2013, providing funding for establishing national networks for manufacturing innovation in targeted areas, including STEM education at all levels, and assisted with preparations for a May 2014 hearing, “Nanotechnology: From Laboratories to Commercial Products,” to reauthorize the Nanotechnology Research and Development Act.

Bhushan believes it is critical that engineers find a way to become involved with policy making to influence lawmaking at the state and federal levels. ✚



Lilly Elected ASME Fellow

The Board of Governors of the American Society of Mechanical Engineers (ASME) elected Associate Professor Blaine Lilly to ASME Fellow status. He is one of a select number of 3,350 Fellows awarded citations out of a total 137,000 ASME members.

Lilly has been teaching at The Ohio State University since 1994, and has been a member of the faculty in the Department of Mechanical and Aerospace Engineering and Integrated Systems Engineering since 1998. He holds four degrees from Ohio State; a BA in English, a BS and MS in Mechanical Engineering, and a PhD in Industrial and Systems Engineering and is a journeyman tool and die maker.

Lilly has been a driving force in engineering education in areas of design and manufacturing and product design over the past two decades. He has developed interdisciplinary curricula and extracurricular learning experiences, moving students from theory to practice, uniquely preparing them for success. He is currently a member of the University Senate for Ohio State's College of Engineering and is a member of The Ohio State University Council on Academic Affairs. ✚



MAE Welcomes Metzler

The Department of Mechanical and Aerospace Engineering welcomed Assistant Clinical Professor **Sandra Metzler** to its already impressive ranks in 2014. Metzler received a BS in mechanical engineering from Purdue University. She worked in the automotive industry for General Motors and in the medical device and pharmaceutical industries before returning to

graduate school at Washington University, where she earned an MS in mechanical engineering and a ScD in mechanical and biomedical engineering. Metzler completed a post-doctoral fellowship in biomedical engineering and worked in the consulting field for 10 years. She currently teaches in the Capstone Design Program in engineering design and biomechanics. ✚

YEDAVALLI AND MCNAMARA TEAMS RECEIVE 2015 AFRL/DAGSI FELLOWSHIP AWARD

Two teams of graduate students and faculty from the Department of Mechanical and Aerospace Engineering at The Ohio State University were awarded an Air Force Research Laboratory/Dayton Area Graduate Studies Institute (AFRL/DAGSI) Student-Faculty Research Fellowship.

Mechanical engineering graduate student **Tim Seitz** and Professor **Rama Yedavalli**, and Associate Professor **Jack McNamara** and aerospace engineering graduate student **Marshall Levett**, are collaborating on separate research topics.

The goal of the McNamara/Levett team's research is to enable reusable hypersonic vehicle platforms by significantly decreasing the time-to-solution associated with long time record structural response and life simulation.

Essential to developing such a simulation capability is understanding and accounting for the strong interdependence between structural life and structural response over the operational history of a vehicle, however, this requires immense compute times. Status quo approaches for reducing time-to-solution of expensive computations is the use of parallel computing via spatial domain decomposition or reduced order modeling. Neither can adequately address this issue.

The research addresses this problem by studying predictor-corrector schemes that enable parallel time marching on high performance computing architectures, distributing the workload required for an immense number of time iterations. The project is being carried out in collaboration

with the AFRL/RQ Structural Sciences Center and the AFRL-Univ Collaborative Center in Structural Sciences.

The research of Professor Rama Yedavalli and graduate student Tim Seitz is based on the theme of integrating robust and/or adaptive controllers in the diagnostics and health management of turbine engines to improve engine efficiency and longevity over a wider range of engine operation envelope. The impact of the research will be to cut maintenance costs on the Air Force's fleet

of planes from high performance fighters to reconnaissance and surveillance planes.

By making control design more tuned to engine dynamics and its health parameters, it is possible to better integrate control, diagnostics and health management of engines by taking into account the degradation of the performance of aging engines. It is likely that existing planes will be able to have a more advanced control system retrofitted and gain the same benefits without having to purchase a new plane.

Because commercial aircraft will also benefit from increased safety, decreased fuel costs from a lighter weight and better tuned controller as well as decreased maintenance, the research will also directly help avionics companies in Ohio. ✨



Ohio State Aerospace Engineering Research Highly Represented at SciTech 2015



Ohio State University researchers presented 40 technical papers at SciTech 2015, held last January in Kissimmee, Florida. The American Institute of Aeronautics and Astronautics (AIAA) SciTech 2015 is a compilation of 11 individual technical conferences focused on aerospace research and is the largest aerospace conference in the world.

The compilation includes 2,500 total presentations from approximately 800 government, academic and private institutions in 40 countries on the latest in aerospace research. The conference covered 300 high-impact topics and provided opportunity for broad collaboration and discussion among attendees.

Ohio State presented the third highest number of technical papers among all academic institutions behind Georgia Tech and Purdue, and tied with NASA Ames for the fifth highest among all institutions behind NASA Langley, Air Force Research Laboratories and the two universities.

According to **Mo Samimy**, John B. Nordholt Professor of Mechanical and Aerospace Engineering, University Distinguished Scholar and Director of the Aerospace Research Center, these impressive statistics clearly validate the strength of the program and show that Ohio State's aerospace research is cutting-edge. ✨

UNIVERSITY LAUNCHES NEW PORTAL FOR ALUMNI

Ohio State has launched a **NEW** portal on their website where alumni can "search for fellow alumni, submit changes to personal information, register for events, share class notes, and more." Go to go.osu.edu/alumni-portal to learn more!

OHIO STATE'S OFFICE OF VOLUNTEER RELATIONS WANTS YOU!

Join Ohio State Volunteer Match to find a volunteer opportunity or create your own – connect with the Buckeye community through service, wherever you are! INTERESTED? Visit volunteer.osu.edu

IT'S TIME TO GO SOCIAL. WE'LL MAKE IT SIMPLE.

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Go.osu.edu/MAEFlickr

SAVE THE DATE! OCTOBER 9–11, 2015 REUNION/HOMECOMING WEEKEND

Mark your calendars to join the celebration, rekindle friendships and visit Ohio State's campus during Homecoming Weekend, October 9-11, 2015. For a complete list of activities visit go.osu.edu/homecoming

MAE Faculty and Researchers Recognized at 18th Annual Faculty Awards

The College of Engineering annually honors faculty members for outstanding teaching and research at the Distinguished Faculty Awards. 2015 Awardees were recognized on April 23 at the Blackwell.

Associate Professor **Junmin Wang** was honored with the **Harrison Faculty Award for Excellence in Engineering Education** for exceptional teaching and qualitative aspects of teaching. Professor **Tunc Aldemir** received the **Lumley Interdisciplinary Research Award** for his established record of excellence in interdisciplinary research. Associate Professors **Jack McNamara** and **Haijun Su** and Research Scientist **David Talbot** were presented with the **Lumley Research Award** recognizing success in pursuing new knowledge of a fundamental or applied nature. MAE congratulates all of our Distinguished Faculty Award winners. ✚

Conlisk Announces Retirement



Professor **Terry Conlisk** has retired after serving 35 years at The Ohio State University. Conlisk is director of the Computational Micro and Nanofluidics Laboratory, recognized as an expert in thermal sciences, electrochemistry and molecular biology. He is the author of a textbook, *“Essentials of Micro and Nanofluidics with Applications to the Biological and Chemical Sciences,”* published in 2012.

College to Honor MAE Alumni Homecoming Weekend

Three alumni of the Department of Mechanical and Aerospace Engineering will be celebrated for their personal and professional achievements at the College of Engineering’s 18th Annual Excellence in Engineering and Architecture Alumni Awards on October 9, 2015, at the Center of Science and Industry (COSI).

Ardeshir Contractor and **Frank Paluch** will be honored with the **Distinguished Alumnus Award**, established by the faculty of the College of Engineering in 1954. The award recognizes distinguished achievement in one’s profession by reason of significant inventions, important research or design, administrative leadership or genius in production.



Ardeshir Contractor (MS 1986) is founder and chief executive officer of Kiran Energy headquartered in Mumbai and India’s leading solar energy utility supplying power to government and industry. Under Contractor’s leadership, Kiran has been a pioneer of grid connected solar photovoltaic plants in India, offering compelling business propositions to large industrial and commercial electricity consumers to integrate the benefits of solar energy. Before entering the solar power market in India, he was managing director at KPMB in India, leading the organization’s investment banking activities and its advisory business. He is the non-executive independent director on the board of Macmillan/Nature India, non-executive independent director of India Blue Mountains Ltd., chair and member of the FICCI, one of the top three Indian Chambers of Commerce, a

frequent speaker at conferences and participant in the Annual Banking Conference of Asia and the TERI-North America US-India Energy Summit at Yale University.



Franks Paluch (BS AERO and ASTRO 1986) is president of Honda R&D Americas, Inc. (HRA) and an operating officer of Honda R&D Co., Ltd. He joined Honda R&D in 1992 and was previously senior vice president of Honda North America, LLC, which provides essential operational services to Honda facilities across North America. Paluch spent one year at the Honda R&D Center in Tochigi, Japan, working on the body design of the first-generation Accord V6, where he gained a better grasp of the Honda culture and the Japanese language. In 2000, Paluch was inducted into the Automotive Hall of Fame, a distinct honor exclusive to the automotive industry reserved for those who have made a significant impact on the automobile. This is the single greatest honor in the automotive business. Inductee contributions are chronicled among the great men and women who have had a positive influence on the industry.

The Benjamin G. Lamme Meritorious Achievement Medal

will be awarded to **Robert Nerem**. Benjamin G. Lamme, ME 1888, achieved international acclaim as a pioneering inventor and engineer for the Westinghouse Electric and Manufacturing Company in Pittsburgh for 21 years. Among his 162 patents were new inventions to railway motors, induction motors, converters and the developments pertaining to the first Niagara Falls power system. In his Will he provided that a gold medal be presented annually to a technical graduate of The Ohio State University for “meritorious achievement in engineering.”



Robert Nerem (MS AERO 1961; PhD AERO 1964) is an alumnus who has bridged many fields of engineering and made an indelible mark in the field of bioengineering. Nerem’s role in academia began in 1964 as an aerospace engineering faculty member at Ohio State. Later, he served as a professor and chairman of the Department of Mechanical Engineering at the University of Houston and in 1987, he became the founding director of the Parker H. Petit Institute for Bioengineering and Bioscience at Georgia Tech. His interest in fluid dynamics led to fundamental research in cardiovascular fluid dynamics. His research focus evolved into tissue engineering and he now heads the Georgia Tech/Emory Center for the Engineering of Living Tissues. He is a past senior advisor for bioengineering at NIH’s National Institute for Biomedical Imaging and Bioengineering. He is a member of the National Academy of Engineering, the Institute of Medicine of the National Academy of Sciences, and a Fellow of the American Academy of Arts and Sciences. ✚



Gary Kinzel is well known at The Ohio State University as the “engineer’s engineer.” A well-respected scholar in the field of mechanical engineering, Kinzel is primarily responsible for the use of computers in mechanical engineering education through the development and dissemination of software and computer-aided design (CAD/CAM) curricula to industry and in academia. He has published more than 100 articles in CAD/CAM, manufacturing, rapid design prototyping, kinematics and linkage design, among other topics.

Students rank Kinzel among the best teachers at Ohio State because of his friendly and approachable demeanor, as well as his enthusiastic teaching and guidance, described by one student as “professionalism at its very best.” Kinzel was the recipient of the Mechanical Engineering Industrial Advisory Board’s Award for Excellence in Undergraduate Teaching in 1997, Ohio State’s College of Engineering Ralph L. Boyer Award for Excellence in Teaching Innovation in 1998, and the College of Engineering Harrison Faculty Award for Excellence in Engineering Education in 1986, and was honored with the university’s 2005 Alumni Award for Distinguished Teaching. Kinzel holds a PhD from Purdue University and joined the faculty at Ohio State in 1978.

We asked him to reflect on his teaching career, talk about what he is doing now and share advice for those following in his footsteps.

Q: You were a pioneer in bringing computer-aided design to the curriculum – and the classroom. Did you have any idea how the use of solid works would mold engineering education today? In the 1980s, we worked with large computers and monochromatic workstations costing \$10,000+ each. We were fortunate to get a \$90,000 state-of-the-art graphics terminal (Evans and Sutherland) but it had fewer capabilities than a modern smart phone, and, at the time, the technology advanced so fast that such equipment was essentially obsolete in two to three years. There was a significant push to integrate computer graphics and interactive design throughout the curriculum but, compared to today, the programs were primitive. My first exposure to solid modeling was in the early 1980s with PADL-2. There were no good constraint managers or equation solvers, so the solid-modeling programs were extremely slow, unreliable and suitable mainly for graduate students. However, the promise was apparent and several companies invested significant resources into making the programs user friendly and reliable. Regardless, none of us thought that solid modeling would become so good so fast. It progressed from being a research topic to a commodity in less than 15 years.

Engineers cannot be successful if they can’t communicate both verbally and in writing — they must communicate persuasively to sell their ideas and solutions when they first start out.

Q: A recent article in *Psychology Today* says that learning people skills is one of the secrets to a life well-lived. How do you think good people-skills can benefit aspiring engineers? Engineers cannot be successful if they can’t communicate both verbally and in writing, they must communicate persuasively to sell their ideas and solutions when they first start out. The trend now is to work on teams, and it is difficult to be effective if you do not know how to interact with and respect others. Also, the purpose of engineering is to produce things that benefit society and this is much easier to do if engineers relate to other people.

Q: What do you think is the greatest change in engineering education since you began teaching at Ohio State? It is an indication of how old I am, but the greatest change is the permeation of computers throughout everything we do. When I first started, there were no word processors, drawing programs, digital cameras, PowerPoint, etc. Finite element analysis was only in its starting phase and solid modeling was generally unknown. Highly accurate simulations were not possible so routine things had to be done experimentally. The computing environment has opened up opportunities to be more efficient at teaching. We can now simulate processes and situations which could not have been done before. I do miss some of the elegant geometric ideas we used to teach, but they are a little hard to justify at the undergraduate level when their use in industry has been superseded by computers and software.

Q: Do you have a favorite “teaching moment?” The biggest thrill I had was when I was teaching my design class in the chemistry building and the provost came in with the OSU Alumni Teaching Award.

Q: How are you writing the next chapter of your life/career? I loved my job at Ohio State, but I am also enjoying retirement. I am currently working on the third edition of an undergraduate kinematics book I co-authored, originally with Ken Waldron. We are introducing a new analysis and design technique called graphical constraint programming based on the numerical and graphics capabilities in modern solid-modeling programs, a very different pedagogical approach. I am still active with ABET and co-teaching a machine design course for a company in Cambridge, Ohio. I also enjoy woodworking, especially making furniture for my grandchildren. And finally, I have land and a small weekend house in southeastern Ohio where I go for exercise. Except for Ohio State football games, I do not watch television, but I am never at a loss for things to do.

Q: Albert Einstein said, “Only a life lived for others is a life worthwhile.” You embody this philosophy. What advice do you have for young people starting their engineering careers? Art Erdman, a faculty friend at the University of Minnesota, once told me when we were both young assistant professors that he took care of his students and they took care of him. I thought that this made sense for both the students and professionals that I interacted with in the department, and it is a policy I have tried to adopt. When I look at the individuals I worked with at Battelle and Ohio State, I think that the ones with the highest quality of life are the ones who helped others first without being too concerned about their own careers. Helping other people to become successful and grow is very satisfying, and it ultimately seems to be career enhancing for those doing the helping. I think that this is why so many of the faculty members in the department have been so successful and it is the approach I recommended to all students as they began their professional careers. ✚



Scott-Emuakpor Honored With Presidential Early Career Award

MAE alumnus **Dr. Onome Scott-Emuakpor** was among the 2014 recipients of the Presidential Early Career Award for Scientists and Engineers. He is currently a civilian employee of the Air Force Research Laboratory (AFRL) located at Wright-Patterson Air Force Base in Dayton, Ohio.

The Presidential Early Career Award for Scientists and Engineers is the highest honor bestowed by the U.S. government on science and engineering professionals in the early stages of their independent research careers. The award was presented in a White House ceremony attended by President Barack Obama.

Scott-Emuakpor received his graduate degrees in mechanical engineering at The Ohio State University (MS '04 and PhD '07). Today, he is the AFRL Turbine Engine Integrity Branch technical lead in the development of new life prediction models and the improvement of fatigue and fracture understanding in gas turbine engine components. He developed an energy-based critical fatigue life prediction method that has led to a greater understanding of fatigue problems in gas turbine engines, allowing for increased durability and safety of engine components. He serves as the structural dynamics technical lead for several developmental projects, including the Efficient Small Scale Propulsion Program, investigating the design of an advanced and affordable small core engine concept for remotely piloted vehicles.

Additionally, he is the structural dynamics lead for the Supersonic Turbine Engine Long Range Program, which enables Mach 3+ rapid-response technologies. He has also participated in a number of investigative teams to help solve aircraft operational issues. Scott-Emuakpor is a member of the American Society of Mechanical Engineers, the American Institute of Aeronautics and Astronautics, and the National Society of Black Engineers. ✨

Penn Engineering Names Kumar Dean



Following a comprehensive search, ME alum **Vijay Kumar** has been named dean of the University of Pennsylvania School of Engineering and Applied Science, effective July 1, 2015.

In the announcement, Penn President Amy Gutmann said, "Vijay's superb academic judgment, compelling vision for the future of engineering and applied science, and proven track record as a leader and administrator make him the perfect choice to lead Penn Engineering."

Kumar joined the Penn Engineering faculty in 1987 and currently serves as UPS Foundation Professor with appointments in the departments of Mechanical Engineering and Applied Mechanics, Computer and Information Science, and Electrical and Systems Engineering. As former deputy dean for education, he was instrumental in the creation of several innovative master's degree programs.

Kumar previously served as chair of the Department of Mechanical Engineering and Applied Mechanics, and as deputy dean of research and director of the General Robotics, Automation, Sensing and Perception (GRASP) Laboratory, a multidisciplinary robotics and perception lab. He also served in the White House as assistant director for robotics and cyber physical systems in the Office of Science and Technology Policy.

Kumar is recognized around the world for his groundbreaking work on the development of more than 400 refereed articles and papers and more than 20 books and book chapters, is a member of the National Academy of Engineering, and a Fellow of the American Society of Mechanical Engineers (ASME) and the Institute of Electrical and Electronic Engineers. He is the recipient of numerous awards and honors including The Ohio State University's Presidential Fellowship, the National Science Foundation Presidential Young Investigator Award, Penn's Lindback Award for Distinguished Teaching, and the ASME Mechanisms and Robotics Award, among others.

Kumar earned his PhD and master's degrees in mechanical engineering at Ohio State and his bachelor's degree from the Indian Institute of Technology in Kanpur, India. His creative theoretical, algorithmic and experimental work on cooperating robots has transformed the science of robotics systems and impacted a wide range of application in the area of networked and cyber physical systems. ✨

Bartsch Co-Creates "Intelligent" Mouthguard

Adam Bartsch, BS ME '01 and MS ME '04, and his colleagues at Case Western and the Cleveland Clinic are making headlines in Cleveland and across the nation. In an interview with the *Cleveland Plain Dealer* last year, Bartsch explains how he and his colleagues have created an "intelligent" mouthguard that could very realistically alter the way concussions are diagnosed and treated. Their work could have significant impact on the future of many popular sports, including the game of football, which has been dealing with the fallout from permanent injury (chronic traumatic encephalopathy) sustained due to concussions associated with play. Their invention holds great promise for improved diagnosis and management of concussions. ✨

Bixler Tackles Water Crisis in Developing Countries

Greg Bixler never set out to build a groundbreaking water pump or start a humanitarian engineering organization. But once the mechanical engineering alum (BS '03, MS '07, and PhD '13) learned about the life-threatening water issues the world's poorest inhabitants face, he couldn't turn away.

It all started with a short-term mission trip Bixler took to central Asia in 2006. Bixler was inspired by residents' ingenuity in using everyday objects to solve problems — such as a car being used as a retaining wall. The trip sparked an idea of bringing together experts from all disciplines to create a problem-solving think tank for humanitarian issues. When he returned to work, he found that many of his colleagues at Battelle wanted to join him.

More than 780 million people worldwide lack access to clean water and changing that statistic isn't as simple as it might seem. In many



villages, the water table is too deep for traditional hand pumps. Even if water is accessible, the commonly used pumps tend to be unreliable, sometimes breaking after only a few months of use. Bixler and his team were asked to find replacement parts for these pumps but couldn't find anything. So they decided to build a better pump.

Bixler co-founded Design Outreach, whose goal is to create life-sustaining solutions for developing countries. More than 40 active volunteers—including engineers, scientists and professionals from Ohio State, Battelle and other companies—donate their time and talents to run all aspects of the organization, from research and development to promotion and fundraising.

The team built and delivered their first prototype water pump to the Central African Republic in 2011. After that real-world test, they improved the design and installed their next-generation LifePump in the Central African Republic in 2012. Besides improved reliability, the LifePump's major advantage is that it can pump water from more than 500 feet deep, unlike traditional hand pumps that tap out at 162 feet.

Since partnering with Christian humanitarian organization World Vision to deliver LifePumps on a wider scale, Design Outreach has installed two pumps in Malawi in villages whose residents previously had to walk more than one mile just to find water. As part of a larger scale pilot program, additional pumps were sent last year to Malawi and four other African countries.

Bixler has returned to academia and humanitarian engineering work full-time and is a lecturer for Ohio State's First-Year Engineering Program. ✦

Story by Candi Clevenger,
The Ohio State University, College of Engineering

Kerechanin Honored with Master Inventor Award

Alumnus **Charles Kerechanin** was recently honored with a Master Inventor Award from the Johns Hopkins University Applied Physics Laboratory (APL), his employer, in recognition for 11 patents issued to him during his 15 years at APL. He is only the 26th person in the 73 year history of the laboratory to qualify for this prestigious award. ✦

New Faces of Engineering Award Presented to Makam



Sandeep Makam, an Indian American technical specialist at Chrysler Group LLC and MAE alumnus, beat two other finalists to win the New Faces of Engineering Award supported by SAE International in a partnership with DiscoverE. The

program promotes the accomplishments of young engineers 30 years or younger by highlighting engineering contributions and the resulting impact of their innovation on society. SAE International is a global association of engineers and related technical experts in the aerospace, automotive and commercial-vehicle industry. ✦

ALUMNI SPOTLIGHT

Bruce Lavash – Esteemed Alumnus

Clearly, Bruce Lavash has a passion for The Ohio State University, the College of Engineering and the Department of Mechanical and Aerospace Engineering. His list of honors, awards and achievements is inspiring, including receiving the college's 2013 Distinguished Alumni Award. Equally impressive is his commitment to serving the university as evidenced by his support of programming initiatives key to improving Ohio State's undergraduate student profile.

As a member of the university's Honors External Advisory Committee and Alumni Advisory Council, his insights and ideas for strengthening Ohio State's honors program have been invaluable. As Procter & Gamble's Victor Mills Society Research Fellow, Lavash has been a lead recruiter at Ohio State and takes great pride in placing graduates in engineering jobs. He is a frequent guest lecturer, involved in numerous campus activities, generously giving of his time, talent and resources.

Supporting Ohio State is also a family affair. Lavash and wife Judy met at Ohio State and his two children, son Brian and daughter Sarah, are mechanical engineering grads. In 2014, The Bruce and Judy Lavash Endowed Scholarship Fund and The Judy Lavash Hornet to Buckeye Endowed Scholarship Fund were created to help young people grow into successful engineers. Lavash says he wants to help students find their passion in the engineering profession he has enjoyed for so many years. In a recent interview, we asked him more about his long-standing Buckeye connection.



Bruce and Judy Lavash with Brutus Buckeye

Q: What is the impetus for your enthusiastic support of Ohio State?

It has evolved over time. Today I'd say it is rooted in "making a difference in the world, investing in improving the world for the future." The reason my wife and I choose to support Ohio State is based on three things. First, there are truly amazing students attending Ohio State and as we have talked with them, learned their values, motivations, talents and interests, we are 100% certain they are a great investment. Second, in virtually every program we are exposed to we see the university doing an excellent job of enhancing students' outlook on life, marketable job skills and humanistic education – molding students with raw potential into outstanding contributors to society. And finally, I have seen that Ohio State is truly open to new perspectives that will drive continual improvement, which tells me the university will be an even better investment in the future. And did I mention National Championship Football?

My first motivation to get involved with Ohio State was because an alumnus colleague at Procter & Gamble told me about season tickets through the President's Club, and that the company had a matching program, so I got on board. Coincidentally, in 2001 when my son started at Ohio State, I became responsible for P&G's engineer recruiting program. As I interviewed students and saw them perform well at P&G, I started thinking, "Man, these students are top-notch! Ohio State must be doing something right." The "amazing student" box got checked.

I built relationships with engineering professors and programs and realized why Ohio State students are so impressive — their natural abilities are being shaped to make them even more competitive on the world stage. Ohio State delivering excellence — check!

Faculty relationships led me to get involved on advisory committees where I saw university leadership supporting a vision of consistent improvement in student experience and growing impact on the world. I experienced first-hand how Ohio State harnessed the diverse talents of alumni to provide input and advice for the future. An institution open to learning how to become better — check that box too!

Q: How has your career at Procter & Gamble influenced your continued involvement and commitment to positively influence future engineers? My greatest value comes from exposing young people to the importance of perspectives and skills beyond engineering science and technology. First, it's about the importance of discovering and developing your personal passion and unique talent. Secondly, it's about learning how to be more effective through a broader business view of the impact of your work and influencing business leaders to take action on your ideas.

As you progress in your career, you discover the kind of work that really ignites your interest and energy – I tell young folks “do what you love, you’ll do it best.” I try to help people find what they do best by discovering their own personal “magic.”

You eventually learn to influence others, understand the perspective of managers and other business functions, and figure out how your idea fits from a different point of view. You have to learn to translate your language of science and technology into business leaders’ language of time, money and risk. This is often a role I take... to teach engineers how to coalesce their learning and ideas into formats that communicate well to others and cause the right action to happen.

Q: Earlier this year, Ohio State dedicated significant resources to lower the cost and improve the value of students’ Ohio State education. What do you think the long-term impact will be for all students, but specifically for engineering students? I’ve learned from my committee involvements that a key strategy at Ohio State is “Access to Excellence.” The focus on excellence has been evident spanning a couple decades of rising academic standards and investment in top academic talent and university infrastructure. It’s wonderful to see Ohio State at the forefront of elite academic institutions with the renewed focus on access and affordability.

I see three risks associated with the rising unaffordability of a university education. First, we’d lose people who belong here, who would benefit from Ohio State’s excellence and who could make a real difference in the world when powered by an Ohio State education. Due to rising costs and financial limitations, these folks may stunt their potential by going straight into the workforce or settling for a narrower educational outcome. We want to see these talented young people here at Ohio State, achieving and contributing at the highest level.

The second risk, especially for engineers, is that financial limitations restrict students to take only the minimum number of classes needed to get their degree on the fastest possible timetable. This causes students to bypass educational experiences outside of engineering that could greatly enhance their worldview, their humanistic perspectives and their ‘soft skills’ related to people interaction and leadership. This is why our daughter Sarah set up a scholarship to support engineers who wanted a broadening experience such as a study abroad program or a minor in a non-technical discipline.

The final risk is that we leave graduating students with significant debt that slows their transition to a fulfilling life. Burdened by debt, they put off important life steps such as settling down in a house, starting families and becoming involved in their communities. They are forced to make decisions based solely on getting the money to pay off debt

versus making decisions based on best using their talents to serve the world. While Ohio State’s actions help, those of us who benefited from an education in a much more affordable era can do something about this. We can make investments in talented young folks through funding scholarships that help them to dream and achieve even bigger things than we did at their age.

Q: According to USA Today, engineering ranks #1 among the top five highest paying degrees in 2015. Based on your experience, how do you explain this trend? I think it’s simple – engineers solve important problems that deliver innovative solutions that make life better for people. And when you make people’s lives better, they value you and your work – and you’ll get paid more. Thus, if we want to remain a highly paid profession, we’d better stay on top of this simple little equation.

As you progress in your career, you discover the kind of work that really ignites your interest and energy – I tell young folks “do what you love, you’ll do it best.” I try to help people find what they do best by discovering their own personal “magic.”

First, we’d better take the time to understand the important problems that people care about. What are the problems whose solutions will truly make a difference in people’s lives? We’d better not become arrogant and start thinking we know what’s better for others – we have to stay in touch in order to benefit real people. And in this global environment, we must be open to the diversity of other perspectives as we seek to serve people and markets with cultures different from our own.

We should also take care that our solutions are an all-around win for the world, not just serving narrow interests. Safety, sustainability, consideration of the societal impacts of our innovation must remain at the forefront, beyond just making money for our own businesses.

And finally, we’d better never get complacent – not rest on the laurels of our last innovation. We should always be thinking, “What’s next? How do I top the last one?” – and look for the next important opportunity to make life better.

Q: What has been the value for you personally in giving back and coming back to Ohio State? The greatest value has been many new relationships that have enriched my life and helped me achieve my greater life purpose of improving the world in the future. There are numerous Ohio State students that I have recruited to P&G over the years. It’s always a pleasure to meet them in the business environment and see how they have grown and developed into great contributors.

Then there are the OSU staffers, professors and administrators whom I have had the pleasure to know and work with. Besides the warm greetings and friendly chats at numerous events, there is the common bond of working together for the betterment of Ohio State, students and the world. They make me feel like we’re all on the same team.

And even at my age, I’m still learning all kinds of new things through Ohio State relationships, and did I mention OSU football? ✨

ALUMNI SPOTLIGHT *Paritosh Ambekar – Young Alumnus Profile*



Dr. Paritosh Ambekar is a health care industry expert with a specific focus on developing countries. He is passionate about developing innovative businesses for emerging markets to increase patient access and improve patient care. Paritosh is the 2015 recipient of the department's E.G. Bailey Entrepreneurship Award (see page 4) presented to "alumni who have invented new products, processes or procedures that have been successfully manufactured, adapted or utilized." It is safe to say that his distinguished career exemplifies entrepreneurial leadership.

In his current role as the Manager of Marketing, Product Management and Customer Experience at Varian Medical Systems Inc. in Palo Alto, California, he leads "intra-preneurial" efforts as the head of strategic and tactical marketing and product development for the next generation global platform to serve under-privileged cancer patients in Africa, Latin America and other developing countries. Paritosh has proven leadership in mission-critical multibillion-dollar projects to deliver revenue growth and is skilled at managing across cultures.

His experience in the Silicon Valley's start-up world led to implementation of new business models, numerous entrepreneurial ventures and development of products such as a new Linear Accelerator, an intravascular robot, a handheld high-dexterity surgical device and a joint-distracting balloon catheter.

We wanted to learn more about this young MAE alumnus, award-winning entrepreneur and business executive.

Q: How has your mechanical engineering background contributed to your entrepreneurial success? Mechanical engineering has been the bedrock on which I have innovated so many products in my career. Mechanical engineering helps an entrepreneur in two important ways. First, to develop a successful entrepreneurial venture in technology, a solid knowledge of mechanical, electrical and electronic systems is necessary. The mechanical engineering education definitely provides such a foundation. Second, and more important, any tough real-world problem requires a systematic and logical problem solving mindset. Arriving at an innovative solution is a journey that starts at certain assumptions and observations, and progresses through multiple feedback loops of trials, failures and breakthroughs. A mechanical engineering degree helped me train in both these aspects and I have been utilizing those technical and logical methodologies ever since.

Q: What prompted your interest in improving health care in developing countries? I come from very humble beginnings. But I am privileged to be able to attend the best schools in the world, mingle with the most innovative minds and work on the most advanced technologies. But early in my career, an episode changed my life and helped me realize my passion.

During a visit to India, I got an opportunity to visit a maternity clinic (run by one of my childhood friends). As I was sitting outside the doctor's office, a family with a pregnant woman came rushing in. The woman was crying and was in severe pain. The family members rushed into the doctor's office. Very soon, to my great surprise, the whole family came rushing out along with the pregnant woman and hurriedly drove off. Not understanding what happened, I followed them to the local government hospital. But by the time I reached the hospital, it was over. The unborn baby had died. I later learned that the family was so poor that they could not afford a \$200 surgery to save the baby's life in the private clinic. So the poor family tried to find free care at the overcrowded government hospital, but failed to get medical attention in time to save the unborn child. I was utterly terrified. It was impossible for me to fathom the fact that a human life was worth less than \$200 dollars.

That episode left a deep scar on my mind. It made me think of how I want to use my education and expertise to make the most positive impact on the world. Helping sick patients by improving health care in the developing countries is what I saw as the best way to make a positive impact in the world. As they say, the rest is history.

Q: It has been reported that despite improvements in providing access to health care, substantial underdeveloped populations still have limited access to quality health care services. What can be done to change this?

In every country around the world, health care is one of the biggest costs for the societies. In the United States, health care costs about \$2.7 trillion dollars per year or about 18% of the gross domestic product. Even though there have been many advances in health care technology,

health care is an extremely complex field. This is mainly due to the presence of a large number of players such as hospitals, physicians, insurance companies, patients, regulators, pharma companies, governments, non-profits and peripheral industries. Various interactions among these players further complicate the matter and create very specific challenges that are not observed in non-health care fields.

One of the ways to address this problem is to think how technology can solve the problems that are usually not considered technological issues. The examples of these issues are – deficiency of human resources, sub-optimal infrastructure, lack of financial markets and sub-par managerial capabilities. Various new advanced technologies such as big data, cloud computing, reverse innovation, micro-finance and tele-medicine are needed to solve these complex issues, currently the focus of my work.

Q: What advice do you have for young professionals entering the engineering profession?

Being an engineer is a privilege – only a very small number of the people in the world have such a luxury of learning. So learn things as if there is no tomorrow and be a student for life. Take on tough challenges and solve big problems. Make a positive impact on the field that you are part of. Think about how you want others to remember you long after you are gone and set your goals accordingly. The motto of an engineer is – *"The difficult I do immediately, the impossible takes a little longer."*

Q: What hobbies do you enjoy? I enjoy reading, both fiction and non-fiction. Lately, I have been reading books on behavioral economics and psychology. I am very much an outdoor person and enjoy water sports such as rowing and windsurfing. I love to meet people from various geographies, cultures and backgrounds different than mine.

Q: What does being a "Buckeye" mean to you?

Being a "Buckeye" means having the Buckeye Spirit. It means following the cycle. Dreaming big. Fighting to achieve those dreams. Momentarily basking in the glory. Then moving the goal post to even bigger dreams. And repeating this cycle until you change the world. ✨

Leading Boldly Into the Future

As the Department of Mechanical and Aerospace Engineering continues its mission to provide students with a world-class education in mechanical, aerospace and nuclear engineering, we are grateful to our alumni and friends for their steadfast support. You have been valuable partners for change and growth – reducing the financial burden on undergraduate students through scholarships, strengthening our popular capstone program offerings, equipping our laboratories with state-of-the-art technologies and much more.



With your help, we will continue to build on our research strengths with our world-class faculty leading the way as we seek to establish endowed chairs and professorships to retain top-tier senior faculty, support leadership priorities and collaborate with industry.

With your help, we will continue to build on our research strengths with our world-class faculty leading the way as we seek to establish endowed chairs and professorships to retain top-tier senior faculty, support leadership priorities and collaborate with industry.

In all that we do, the student experience is our first priority. Our undergraduate program is setting the bar with the introduction of the Technical Elective (TE) Program as part of curriculum innovation, the importance of which cannot be underestimated for our students. In recent conversations, students reinforced the value of hands-on, experiential learning opportunities early on to reach educational objectives and excel in future engineering practice.

None of this is possible without your generosity, support and connection to the department and Ohio State. Thank you for giving back and coming back. ✨

Gregorek Endowment Established

Aerospace alumni led the effort to create an endowed fund in honor of **Dr. Gerald M. Gregorek**, well known for his teaching innovation and aerodynamics research. Gregorek was the recipient of this year's Garvin L. Von Eschen Alumni Award (see page 5), given to an alumnus who has demonstrated technical and administrative excellence in aerospace engineering.

The fund will provide support for 3rd and/or 4th year undergraduate students enrolled in the College of Engineering, majoring in aerospace engineering. Criteria include U.S. citizenship; involvement in a student organization; demonstrated leadership abilities and GPA.

Doug Ball and Phil Combs, External Aerospace Advisory Board members, led the charge in establishing core leadership gifts. "Every aerospace engineering alumnus I have met mentions Jerry by name and how much they enjoyed his classes," said Ball. "He had a knack for making engineering come alive."



Combs reflected on Gregorek's 50-plus years of history with Ohio State. "As a student and ultimately as a faculty member, Jerry has always found ways to give back to the university," Combs said. "This scholarship fund represents an opportunity for all of us that know him to demonstrate our appreciation for his many years of service – far from an adequate thank you for the impact he has had on so many of his students' lives." ✨

To make a gift to the Gregorek Endowment go to go.osu.edu/Gregorek or call 614-292-2141.

MAE Leadership Fund — Bridging the Gap

We are truly grateful to the many generous contributors of the MAE Leadership Fund, including Daniel Wieczynski, Ralph Rockow, Saeid Rahimian, Anne Clippard, Dan Kimmel, Bruce Clark, Charles Frost, William Schulze, William Rudolph, and others.

Within the last year, we have effectively used this precious resource to promote excellence by supporting, for example, (a) our students and future leaders to attend conferences; (b) student organizations to participate in their national activities, including Pi Tau Sigma (ME Honor Society) – National Convention, National Society of Black Engineers (NSBE) Conference – National Convention, Engineers for a Sustainable World (ESW) – Regional Conference, and Society of Asian Scientist and Engineers – Midwest Regional Conference; (c) the activities of student project teams, including Biomolecular Design Team, Solar Education and Outreach, and Haiti Empowerment Project; (d) professors of practice in attending professional society meetings and conferences; and (e) departmental seminars by hosting distinguished scholars as speakers from prestigious institutions, including Columbia University, Princeton, Stanford, and MIT. ✨

To make a gift to the MAE Leadership Fund go to go.osu.edu/give-to-mae or call 614-292-2141.

IN MEMORIAM

The Department of Mechanical and Aerospace Engineering is deeply saddened at the loss of valued students, faculty and alumni over the past year. We remember each of them fondly, celebrate their lives and individual contributions, and extend our sincere sympathy to family and friends.

WALTER LEMPert (April 11, 2015) was a faculty member and notable scholar helping to enhance the department's reputation in energy, fluid and thermal systems. He left an indelible mark and legacy of excellence in education at Ohio State. **The Walter Lempert Memorial Fund (315164)** was established at Ohio State in his memory.

STAN JOHNS (April 1, 2015), alumnus in aeronautical engineering, was described as "a man of science and spirit," a rocket builder and NASA engineer, problem solver and vintage car aficionado.

STEVE HALL (February 17, 2015), ME alumnus and former Ohio State men's basketball player, taught math and coached girls basketball and tennis at Grandview Heights High School because he had a passion for giving back. Described as a "totally selfless individual," he was well loved by his students and the community.

STEPHANIE FIBELKORN (December 12, 2014), a third year student majoring in mechanical engineering, was an inspired and dedicated student. She was a graduate of the Disney College Program and well on her way to achieving her dream of becoming a "Disney Imagineer." MAE faculty voted to award the degree of BSME posthumously to Stephanie. She will be greatly missed by all who had the good fortune to interact with her. **The Stephanie Fibelkorn Memorial Scholarship Fund (482824)** was established in Stephanie's memory to give financial assistance to female engineering students at Ohio State.

RUPERT ATKIN (December 11, 2014), ME alumnus, lived a life of achievement, invention, leadership and humor. He had a successful career in the automotive industry working at Kelsey-Hayes Company and TRW, Inc. and held 25 patents and numerous honors, including an Honorary Doctor of Science from Ohio State. He was an avid golfer, a talented musician and was considered one of the world's "last true gentlemen."

WALTER STARKEY (November 11, 2014), former faculty member in ME, was highly respected for his masterful and methodical approach to machine design. He achieved a national reputation through numerous publications and patents, helping to enhance the department's reputation as one of the top universities in the country in machine design. He was one of only three people at Ohio State to receive the American Society of Mechanical Engineers (ASME) Machine Design Award. He leaves a lasting legacy.

RYAN MARCIA (September 28, 2014), 2012 mechanical engineering graduate employed by ExxonMobil, loved Ohio State and was well known as a charismatic leader, selfless person and loyal friend.

The Ryan Marcia Memorial Scholarship (482713) was created to help future Buckeye hopefuls begin their own journey. ✨

To make a gift online to a designated memorial fund go to giveto.osu.edu and reference the name or fund number — or call 614-292-2141.

RETROSPECTIVE

Bertha Lamme-Feicht

We Remember: Bertha Lamme-Feicht
December 1869 – November 1943

A gifted engineer and pioneer, Bertha Lamme-Feicht was born in Springfield, Ohio, in December 1869 and died in November 1943. She earned a degree in mechanical engineering with a specialty in electrical engineering from the Mechanical Engineering Department at The Ohio State University in 1893; the first woman to receive an engineering degree at Ohio State and the first woman to receive an engineering degree from any university in the United States.

After graduation, Lamme joined the Westinghouse Company where she worked in mathematics and machine design on one of the most creative and innovative electrical engineering teams in history, led by her brother, Benjamin Lamme. Together, they revolutionized the field of engineering. A 1907 edition of the *Pittsburgh Dispatch* reported, "Lamme's work in designing dynamos and motors established her reputation — even in that hothouse of gifted electricians and inventors."

During her 12 years at Westinghouse, she worked with the company's best and brightest including her future husband, Russell Feicht. A highlight was working on a 2,000 horsepower motor that Feicht designed and that Westinghouse displayed at the 1904 St. Louis Fair.

Lamme's achievements inspired other women to study engineering in a time when women were welcome to compete with men only until they were married. She worked at Westinghouse until 1905 when she married Feicht, director of engineering at Westinghouse at the time. Following her marriage, Lamme worked in engineering from home in addition to being a wife and mother. Her daughter, Florence, born in 1910, became a physicist and was employed by the U.S. Bureau of Mines at the time of her mother's death.

The department's Bertha Lamme-Feicht Award, now the Ada Irene Pressman Award, is presented to alumni who have made noteworthy contributions to their chosen professions while overcoming significant barriers in completion of their education or obstacles in their careers. The award is presented as part of the department's annual Honors and Awards Ceremony recognizing outstanding alumni. ✨





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Peter L. and Clara M. Scott Laboratory
201 W. 19th Avenue
Columbus, Ohio 43210
Phone 614-292-2289
mae.osu.edu

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Professor Ahmet Selamet, Chair
selamet.1@osu.edu

Associate Professor Rob Siston,
Editor-in-Chief
siston.1@osu.edu

Gail Dickson, Editor
dickson.115@osu.edu

Stephanie Henry, Graphic Design

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