

Agricultural & Biological Engineering



*Time for a new building
— and it's ABE's turn*

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Imagine the Possibilities

*With your help, a bigger, better home
for nation's #1 ABE program.*

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Imagine the possibilities

Nation's #1 ABE program is in line (at last) for bigger, better home. Alumni, will you help?

We are bigger – more undergraduates (398, up 74% since 2004), more graduate students (124, up 51%) and more faculty (11 new hires in the past four years.)

We are better – in fact, the best, according to US News & World Report rankings for most of the past decade.

And yes, we are *still* based in the building we know and love.

But for years Purdue's Agricultural & Biological Engineering building on South University Street has shown its age and limitations. The original section was constructed in 1928; the rest of the three-story portion of the building arrived in 1940. The one-story, high-bay space on the south side was added in the 1950s.

Simply put, our facilities have not kept pace as our program has grown. ABE has faculty, students and laboratories in 10 other buildings across campus. In nearly all cases we are "guests" in these facilities. Compounding our space challenge is the type and quality of laboratories. More than a few labs we use are simply not up to the standards required.

It's time for something new – and it's ABE's turn.

On Aug. 26, 2016, the Purdue University Board of Trustees approved a 10-Year Capital Plan that positions the ABE building renovation and addition as the top University priority for the 2017-2019 Legislative Capital Request. Purdue will ask the state for \$69 million of the estimated \$80 million project cost. We should know the status of our capital request by the end of June 2017, when the legislative session closes.

#1
Undergraduate and graduate program rankings every year since 2009, U.S. News & World Report.

\$11 million
College fundraising goal for new ABE facility.

\$6.5 million
Amount in ABE awards to support research in 2015-16.

11
Number of buildings currently used to house the fragmented ABE department.

1928
Year the original portion of the ABE building was constructed.

The project, briefly, as it now stands:

- The three-story portion of the existing building will be renovated.
- A multi-level facility will rise in the footprint of the one-story portion, which will be razed.
- 125,000 square feet of new space will be added.

We are confident that the project will provide the quantity, quality, and type of space needed to support our students, faculty, and staff in their learning, discovery, and engagement efforts into the foreseeable future.

ABE is committed to growing undergraduate enrollment by 100 more students during the next four years. Additional faculty likely means more

graduate students in the coming years. (The recent faculty hires are part of Engineering Strategic Growth with support from the College of Agriculture. See more about some of our new faculty on Pages 10-11.)

The quality of our program remains among the best in our field. We are the nation's top-ranked biological/agricultural engineering program, as judged by US News & World Report, for the past six years at the undergraduate level and eight years at the graduate level. (Honesty compels us to note that occasionally we tied for first!)

ABE's research and Extension programs continue to be at the forefront of discovery and engagement. As you might expect, these efforts also are growing.

Our students, staff, faculty and alumni have achieved so much. In new, improved facilities, just imagine the possibilities.

125,000+
square feet

Classroom, office, and laboratory space in new facility plan.

500

Number of undergraduate students ABE is committed to enrolling by 2020.

74%

Undergraduate enrollment increase — from 228 students in 2004 to 398 in 2016.

51%

Graduate student enrollment increase to 124 students from 2004 to 2016.

ABE's renovation and new building addition will be possible only with a combination of support — from the Indiana legislature and you.

Friends and alumni like you are key to achieving the \$11 million fundraising goal for this facility. (That amount is the difference between our request to the state and the estimated cost of construction.) Can I count on you to help?

This is the most significant project I have been part of since becoming head of the department 12 years ago. I encourage you to consider how you might be part of this very special initiative. Contributions can be designated to the "ABE Building Fund" at giving.purdue.edu/ABE. Feel free to contact me with any questions about the project, including naming opportunities.

Thank you in advance for your tremendous generosity!

BERNIE ENGEL
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Agricultural & Biological Engineering
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AgrAbility – 25 years and counting

The vision of AgrAbility is to enable a lifestyle of high quality for farmers, ranchers, and other agricultural workers with disabilities, so that they, their families, and their communities continue to succeed in rural America. For this target audience, success may be defined by many parameters, including: gainful employment in production agriculture or a related occupation; access to appropriate assistive technology needed for work and daily living activities; evidence-based information related to the treatment and rehabilitation of disabling conditions; and targeted support for family caregivers of AgrAbility customers.

AgrAbility, which is celebrating its 25-year anniversary, is based in the Breaking New Ground Resource Center in ABE.



Purdue ABE still reigns on annual US News list

Each year, US News & World Report publishes rankings for colleges and universities in many categories, including Engineering schools. This spring, our graduate program topped the ABE list for the eighth consecutive year. For the sixth consecutive year, Purdue ABE is ranked #1 among undergraduate programs – meaning three consecutive classes spent their entire undergraduate years in the nation’s top-ranked program.

Yes, we’re growing

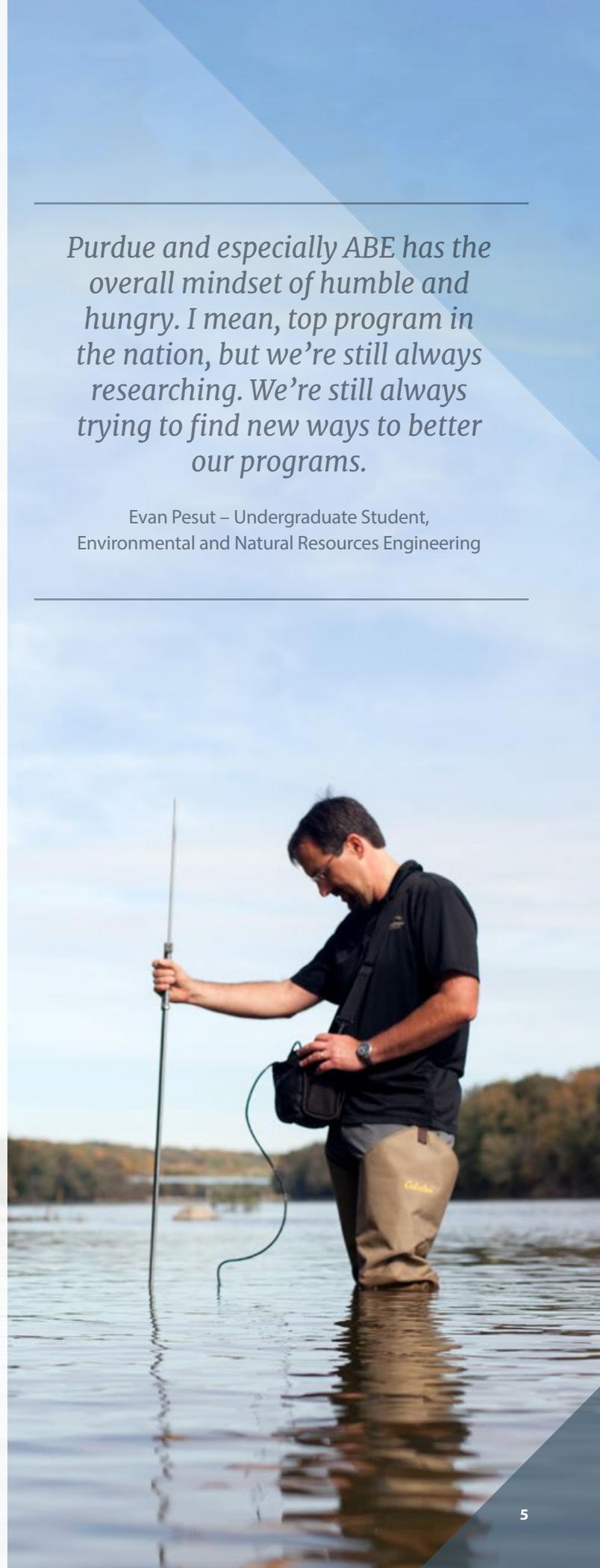
Agricultural & Biological Engineering continues to set records for enrollment, both in the undergraduate ranks and in the graduate school. We have 398 undergrads enrolled for the fall semester (2016) and graduated 83 this past spring. We have 124 graduate students enrolled for the fall semester and graduated 39 this past year (May, August, and December.) We have seen mostly steady increases this decade in enrollment as well as number of graduates.

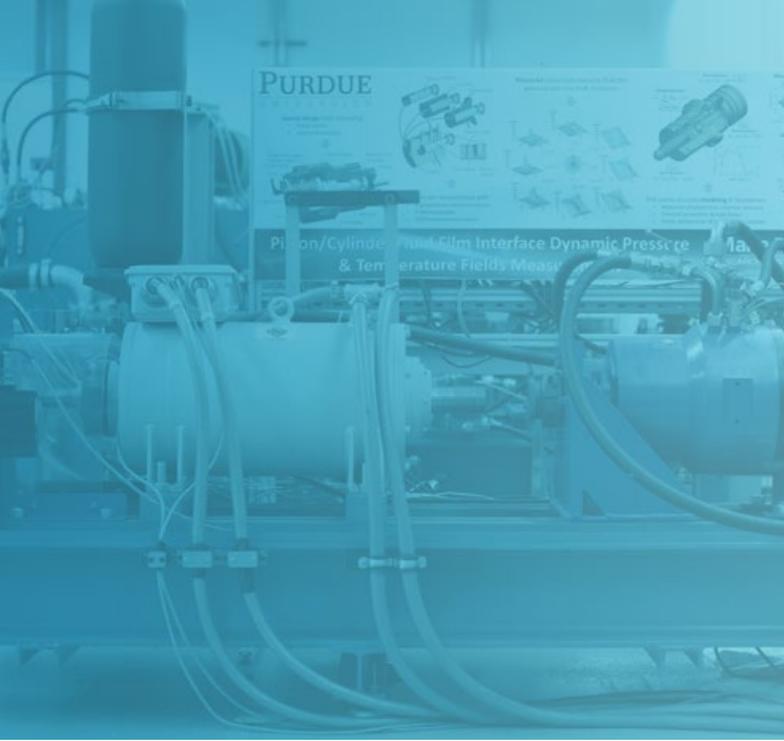
Undergraduate Numbers

AY	ENROLLED	GRADUATED
2010-11	335	52
2011-12	347	49
2012-13	377	76
2013-14	387	49
2014-15	406	88
2015-16	397	83
2016-17	398	81

Purdue and especially ABE has the overall mindset of humble and hungry. I mean, top program in the nation, but we’re still always researching. We’re still always trying to find new ways to better our programs.

Evan Pesut – Undergraduate Student,
Environmental and Natural Resources Engineering







Patents — who's moving the world forward?

Our faculty are on the cutting edge when it comes to improving and creating new processes and products. Many of our faculty have multiple patents in varied fields and applications. We believe in moving the world forward, and our faculty take the lead.

NEW PATENTS SINCE JAN. 1, 2015

8,921,648 B2, Vermerris, W.E.; Ladisch, M.R.; Mosier, N.S., *Methods for Increasing the Yield of Fermentable Sugars from Plant Stover*, Dec. 20, 2014.

8,962,729 *Biobased Hydrophobic Surface Treatment Agent for Porous Materials*, Tao; Bernard Y., Coates; Kevin C., Weiss; William Jason, Mohtar; Samia, Peled; Alva February 24, 2015

9,026,421 Tao; Bernard Y, Liu; Junli. *Application of Modified UNIFAC Model in Thermodynamic Modeling the Cloud Point of the Mixture of Fatty Acid Methyl Esters*. May 5, 2015

9,115,748, Ivantysynova, Monika, Baker, Jonathan. *Axial Sliding Bearing with Structural Sliding Surface*, August 25, 2015.

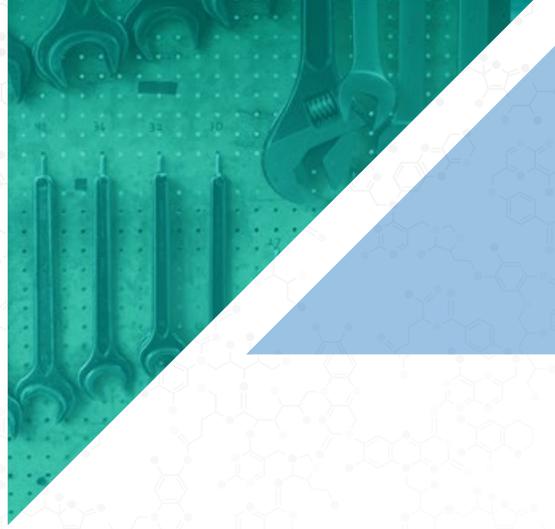
9,194,107, Andruch, III, John and Lumkes, Jr., John H. *A Fluid Power System that Allows Energy Recovery from Assistive Actuator Loads and be Diverted to Other Actuators through Fluid Connections*. November 24, 2015.

9,200,648, Lumkes, John H.; Batdorff, Mark Allen; Merrill, Kyle Joseph; Holland, Michael Andrew; Wilfong, Gabriel Jordan. *Fluid Control Valve Systems, Fluid Systems Equipped Therewith, and Methods of Using (Bidirectional Check Valve)*. December 1, 2015.

9,221,733, Kim, Y., Hendrickson, R.L., Mosier, N.S., Ladisch, M.R., Hillaly, A.K. *Drying of Fuel Ethanol Using Tapioca Pearls*, December 29, 2015.

9,228,154 Tao; Bernard Y., Mohtar; Samia. *Long Chain Alkyl Methyl Ester Compositions with Enhanced Physical and Chemical Properties*. January 5, 2016

9,272,468, Ileleji, Klein, Probst, Kyle, *Simultaneous Agglomeration and Drying of Distillers Grains to Produce Spherical Pellets (Granules) in a Rotary Drum Dryer*, March 1, 2016.



More recognition for our award-winning faculty

MORRILL AWARD, 2016

In April, Professor Monika Ivantysynova was one of three Purdue professors to receive the Morrill Award, for excellence in teaching, research and engagement missions. The fifth annual award comes with a \$30,000 prize. Ivantysynova is one of the founders of Fluid Power Net International, the field's first international scientific network, and she established Purdue's Maha Fluid Power Research Center.

MORRILL AWARD, 2015

Professor Michael Ladisch received the Morrill Award in 2015 for advances that have enabled efficient and environmentally friendly production of ethanol from corn.

KOSKI MEDAL

Professor Monika Ivantysynova received the Robert E. Koski Medal, awarded by the American Society of Mechanical Engineers. It recognizes individuals who have advanced the art and practice of fluid power motion and control through education and/or innovation.

GILLEY ACADEMIC LEADERSHIP AWARD

Department Head Bernie Engel received the James R. and Karen A. Gilley Academic Leadership Award at the 2016 ASABE annual meeting.

KISHIDA INTERNATIONAL AWARD

Professor John Lumkes was presented with the ASABE's 2016 Kishida International Award honoring contributions to engineering/mechanization/technological programs of education, research, development, consultation, or technology transfer.

UNIVERSITY FACULTY SCHOLAR

Professor Jenna Rickus was declared a University Faculty Scholar, a Purdue recognition of tenured associate and full professors who have been in that rank for no more than five years and are on an accelerated path for academic distinction in the discovery and dissemination of knowledge.

EXTENSION DIVISION EDUCATION MATERIALS AWARD

Hort Plants, an app that Associate Professor Dharmendra Saraswat co-developed at the University of Arkansas, was selected for the Extension Division Education Materials Award. The award was presented in August 2016 at the American Society for Horticultural Science national meeting in Atlanta.

ARKANSAS ACADEMY OF B&AE

Indrajeet Chaubey, an ABE professor and Department Head of Earth, Atmospheric, and Planetary Sciences, in April was inducted to the Arkansas Academy of Biological and Agricultural Engineering.

AG RESEARCH AWARD

Professor Nathan Mosier received the 2015 Purdue University Agricultural Research Award for his work in biofuels and bioprocessing technology. His research primarily focuses on developing new ways to efficiently convert agricultural materials into fuels, chemicals or other products traditionally made from petroleum and natural gas.

FDA FOOD SAFETY CHALLENGE

Professor Michael Ladisch led a team that earned the 2014 FDA Food Safety Challenge grand prize. The team developed a physical method for concentrating salmonella to detectable levels using automated microfiltration. The competition's goal is to advance breakthrough ideas on how to find disease-causing organisms, especially salmonella, in food.

DISCOVERY PARK ENTREPRENEURIAL LEADERSHIP ACADEMY

Two ABE faculty members, Meng Deng and Andrea Vacca, were named to the 2016-2017 Entrepreneurial Leadership Academy. The program is housed in the Center for Innovation and Entrepreneurship in Discovery Park. The academy is a resource support program for faculty who have entrepreneurial interests.

VIOLET B. HAAS FELLOWSHIP

Assistant Professor Sara McMillan received the 2015 Violet B. Haas Fellowship from the Susan Bulkeley Butler Center for Leadership Excellence. The award honors those who help women advance through hiring, promotion, education and salary, or who enhance a positive professional climate for women at Purdue.

RESEARCH REFRESH (R²)

Associate Professor John Lumkes is one of seven Purdue faculty members approved for the 2015-16 Research Refresh program. Sponsored by the provost's office, R² is designed to provide protected time for those who would benefit from intense focus to advance their scholarship and reinvigorate their careers.

SCHOLARSHIP OF ENGAGEMENT FELLOW

Associate Professor Klein Ileleji was among eight Purdue faculty members named Scholarship of Engagement Fellows by the Office of Engagement.

INDIANA SOYBEAN ALLIANCE CHAIR

Professor Nathan Mosier was appointed the Indiana Soybean Alliance Soybean Utilization Endowed Chair in 2015. He will help lead research into new uses for soybeans, such as in biofuels, and in non-food products, including consumer electronics.

NATIONAL ACADEMY OF ENGINEERING

Assistant Professor Sara McMillan was one of three Purdue faculty members participating at the National Academy of Engineering's eighth Frontiers of Engineering Education in Irvine, California, in September.

SERVICE TO STUDENTS AWARD

Dan Taylor, Assistant to the Department Head, received the Outstanding Service to Students Award.

STUDENT CHOICE AWARD

The inaugural Student Choice Award for student club advisor was presented this spring to Dan Taylor, Assistant to the Department Head.

RESNA AWARDS

Professor Bill Field was named an Honorary Fellow by RESNA, the Rehabilitation Engineering and Assistive Technology Society of North America. At the annual meeting in July, the organization also gave the RESNA Leadership Award to the AgrAbility Program, which is also known as Breaking New Ground. Field supervises the Breaking New Ground Outreach Program.

DISTINGUISHED EXTENSION EDUCATOR AWARD

Professor Roger Tormoehlen received the inaugural Distinguished Extension Educator award from the American Association for Agricultural Education. He was recognized for North Central regional and national level work in youth-based educational outreach and engagement, especially with low-income youth from less than stellar rural schools. The association noted how he applied basic principles of science to solve problems using electrical demonstrations, robots and computer-based learning.

New and familiar faculty faces



Kingsly Ambrose

Dr. Kingsly Ambrose came (back) to Purdue in August 2015. He received his Ph.D. from Purdue ABE; his master's and bachelor's degrees were from Tamil Nadu Agricultural University in India. Before returning to Purdue, he was an Assistant Professor in the Department of Grain Science and Industry at Kansas State University. His current research focuses on the application of particle technology concepts in food and agricultural processing; research areas include particulate flow and materials handling, seed and grain processing, prevention of grain dust explosion, and modeling the

handling and processing of food, feed and agricultural materials. He teaches ASM 55000, Grain Drying and Storage. This semester he is co-teaching ABE 30500, Physical Properties of Biological Materials (with Dr. Richard Strohshine) and ABE 59100, (FS 45500) Cereal Grain Chemistry and Processing (with Dr. Bruce Hamaker).

Dr. Ambrose is also part of the College of Engineering's team on designer particulate products. This team focuses on model-based relationships for food, feed, consumer goods, specialty chemicals, agricultural chemicals, pharmaceuticals and energetic materials, to produce engineered particles and build capacity through a highly qualified workforce in particulate science and engineering.



Kari Clase

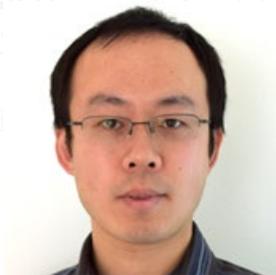
Dr. Kari Clase earned a bachelor's degree in Biochemistry from Old Dominion University and Ph.D. in Biochemistry and Molecular Biology at Purdue. As an assistant professor at Ball State University, she helped implement an M.S. in Biotechnology. Her Purdue lab investigates the mechanisms controlling neural cell proliferation and differentiation within brain tumors through proteomic and metabolic analysis.

She developed and implemented an undergraduate minor in Biotechnology, a graduate certificate in Biotechnology Quality and Regulatory Compliance, and a new Master of Science concentration in Biotechnology Innovation and Regulatory Science. Dr. Clase, who has a joint appointment with the Purdue Polytechnic Institute, is also the Director of the Biotechnology Innovation and Regulatory Science Center; one of its missions is to develop global programs to ensure sustainable access to medicines for Africa and developing nations.



Roger Tormoehlen

Professor Roger Tormoehlen came to Purdue in 1988 as an assistant professor in the Department of 4-H Youth Development. In 2003, he became head of the newly formed Department of Youth Development and Agricultural Education. In August 2015, he moved to the Department of Agricultural and Biological Engineering. One of his priorities is providing leadership for P-12 engineering educational initiatives; growing the National Youth Engineering Challenge is part of that effort.



Jian Jin

Jian Jin received his Ph.D. in Agricultural Engineering from Iowa State University in 2009, his M.S. degree in Computer Engineering from Denmark Technical University in 2005 and a B.S. degree in Computer Science from Zhejiang University in 2003. Before joining Purdue, he conducted research at DuPont Pioneer, where he was a Technology Leader working on automatic phenotyping and sensing and led a team for the company's hyperspectral imaging systems for automated plant screening.

Dr. Jin's major research interest at Purdue is to build the next-generation automatic crop plant phenotyping system, along with machine vision, data processing, statistics, and big data modeling. Dr. Jin teaches a graduate level class, ABE 59100, Plant Phenotyping Technologies, and an undergraduate class, ABE 31400, Design of Electronic Systems. Postdoc and Ph.D. positions are currently open in his research group.



Dharmendra Saraswat

Dr. Dharmendra Saraswat joined ABE in fall 2015 as an associate professor. Prior to coming to Purdue, he was an Associate Professor at the University of Arkansas. He received a bachelor's degree in agricultural engineering from the University of Allahabad; a master's degree in agricultural engineering from the Indian Agricultural Research Institute, New Delhi, and a Ph.D. in food, agricultural and biological engineering from The Ohio State University.

His research focus is on finding novel solutions for challenges in plant production (field and nursery crops) and management of natural resources through the application of information and communication technologies. His expertise includes watershed simulation modeling, spatial and temporal modeling using remote sensing and geographic information systems and data collection/analysis from field and innovative unmanned aerial systems-based sensors.



Kevin Solomon

Dr. Kevin Solomon earned a bachelor's degree in Chemical Engineering & Bioengineering from McMaster University in Canada, then a M.S. and Ph.D. in Chemical Engineering at MIT. Before joining the Purdue faculty in January 2016, he was a postdoctoral scholar at UC-Santa Barbara, where he evaluated the potential of microbes from cattle and other livestock for biofuel production. His multidisciplinary research program integrates genomics and systems/synthetic biology to develop microorganisms that sustainably produce fuels, medicines, and advanced materials.

Current research projects include engineering ruminant microbiomes for antibiotic-free livestock, developing technologies to improve the properties of industrial microbes, and controlling microbial activity in oil fields to enhance oil recovery.

His teaching interests revolve around the application of engineering principles to the design and construction of biological systems. He introduced a new course this fall, ABE 59100 Principles of Systems & Synthetic Biology, and will join Professor Jenna Rickus in the spring to teach ABE 44000, Cell & Molecular Design Principles.

Retiring

Dr. Krutz wraps up stellar Purdue career



State Rep. Sheila Klinker, District 27, congratulates Dr. Gary Krutz on his 40 years at Purdue.



Dr. Gary W. Krutz will retire from Purdue University in early January 2017 after a long and productive career filled with impact and inspiration – and more than a small dose of fishing. The celebration honoring his career was Oct. 15, 2016.

Professor Krutz earned a B.S. in Mechanical Engineering in 1967 and an M.S. in Agricultural Engineering, in 1969, both from the University of Wisconsin. He worked for Ford Motor Co. in Dearborn, Michigan, for several years and earned an M.A. in Economics from the University of Detroit. He completed a Ph.D. in Agricultural Engineering at Michigan State University in 1976 with a focus on finite element modeling of welded joints. In 1976 he moved to Purdue University and became an official Boilermaker.

Dr. Krutz put his knowledge of finite element analysis to work throughout his career on a diverse set of topics — sewage fields, sports surfaces, brackets, mechanical devices, and most recently in polymeric materials with integrated sensors. His work related to agricultural equipment and machine design has been published in many papers and journal articles. He has been a prolific inventor, with 10 patents and five pending patents.

His inventions, copyrights, and patents range in topic areas from fishing, software for statistical tolerancing, forage machinery, combine controls, sensing within hydraulic motors, and embedded sensors in flexible devices such as tires, belts, hoses, and replacement body parts. He has consulted with a wide range of firms, including Deere, TRW, Allis Chalmers, Sun Hydraulics, Kentucky Fried Chicken, DeKalb-Pfizer Genetics, and Caterpillar.

He co-authored a Wiley textbook – “*Design of Agricultural Machinery*” with Lester Thompson and Paul Claar. A revision – “*Machine Design for Mobile and Industrial Applications*” (and a 2nd edition) – was published by SAE with authorship of Krutz, John Schueller, and Paul Claar.

Over 40 years at Purdue, Dr. Krutz positively influenced thousands of students. He served as major professor for 48 M.S. and 14 Ph.D. graduates. He received the university’s highest teaching award, the Charles B. Murphy Award, and is in the Purdue Book of Great Teachers. He received the ASAE A.W. Farrall Outstanding Young Teacher award, and a USDA Teaching Award. He launched the ABE Entrepreneur Day, which is now sponsored by the College of Agriculture. Gary is a fellow of SAE, ASABE, and is a proud licensed Professional Engineer.



Retired faculty: Where are they now?

We asked retired faculty what they do with their “free time,” and what they have planned for the future.

John Barrett – Retired 1996

We do a lot of outdoor activities: downhill skiing, mowing, cutting wood, things like that. I work with a group that picks up furniture donations and distributes the items to those that need them. We meet up with friends at McDonald’s to swap Purdue gossip. We eat out a lot — I wish there was a good restaurant in town. East Main Grill may make it!

We are headed to Michigan to pick apples and will be celebrating Elizabeth’s birthday.

Don Jones – Retired 2010

There is not nearly as much free time as I thought there would be. I have spent a lot of time reading all the books I didn’t read for the last 35 years. I got a recumbent bike, and I spend a lot of time riding around the neighborhood. We’ve done a fair amount of traveling, mostly domestic. We did take one cruise to the Caribbean.

We are hoping to get back to traveling regularly again next year.

R. Mack Strickland – Retired 2008

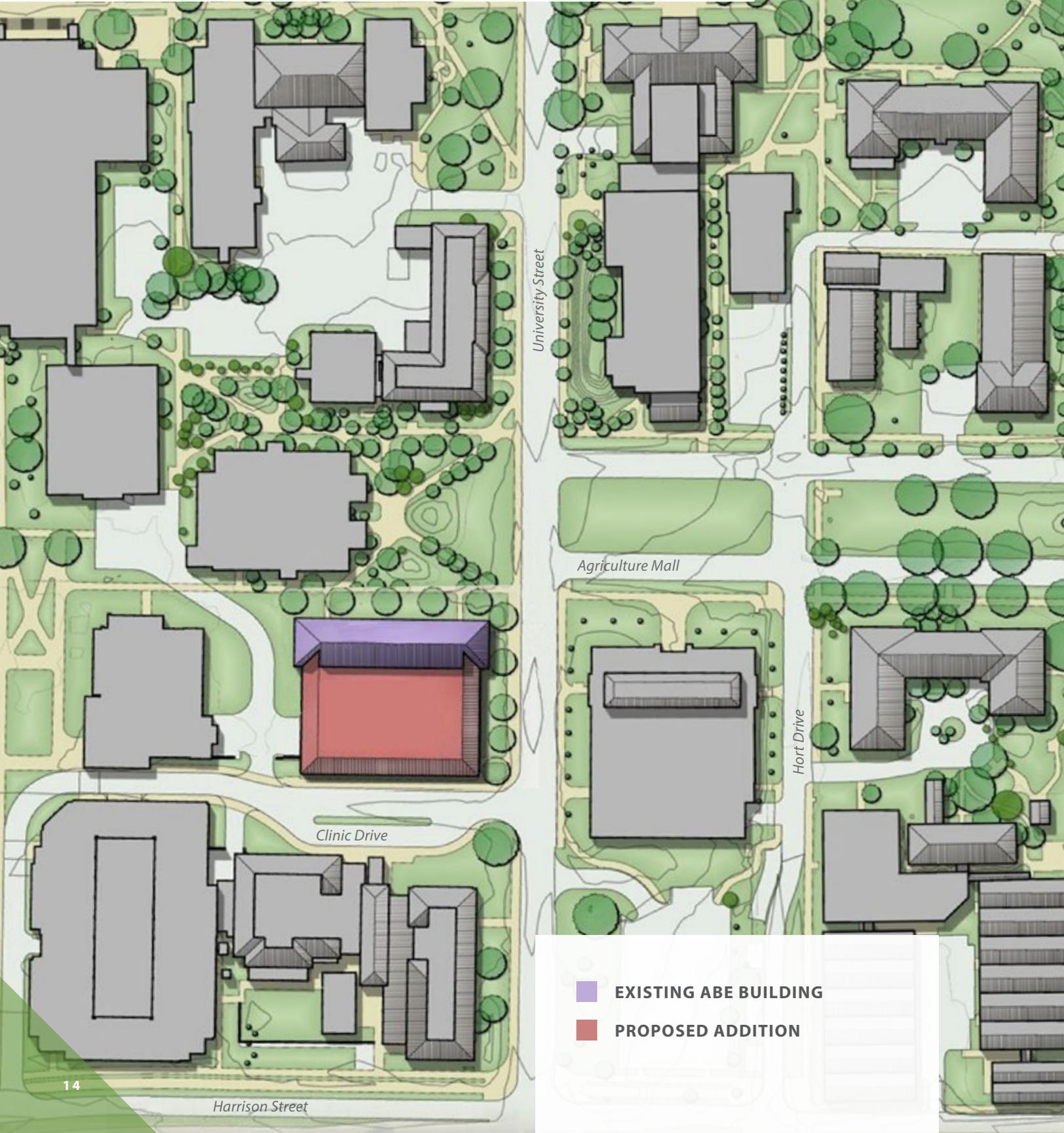
I have played some golf. Spent most Septembers and the last couple of weeks of October hunting elk in Wyoming out of my buddy’s cabin at 9,000 feet up in the Medicine Bow National Forest west of Laramie. Spent a week in the middle of November hunting deer at my farm in Washington County, and a week there the last of April, turkey hunting.

My wife and I went on our first vacation in over 10 years (vacations used to be wherever the ASABE summer meeting was) in June 2015 to Williamsburg and surrounding Civil War battlefields for our 40th wedding anniversary. Have done a lot of honey-do lists. Took my daughter to London, Paris, and Rome for her 30th birthday in 2013. Took her to Alaska this August. Spend a lot of time with grandkids.

We will be taking the entire family to Disney World in February. My wife wants to go to Scotland and Ireland, so will probably do that in the near future.



A dramatic change for the better



State Street

University Street

Agriculture Mall

Hort Drive

Clinic Drive

Harrison Street

EXISTING ABE BUILDING

PROPOSED ADDITION



How to donate

With your help, Purdue will be closer to a long-cherished goal: A bigger, better home for the nation's #1 ABE program.

DONATE ONLINE
giving.purdue.edu/ABE

CALL OR TEXT US
Joel Hartman (812) 592-7411
Tammy Kettler (317) 752-0076
Eric Putman (765) 479-1924

SEND YOUR GIFT
Purdue Foundation,
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West Lafayette, IN 47907

NEED ASSISTANCE?
Please call us at (800) 319-2199
or email us at gifts@prf.org.

We are using research in the classrooms to teach, and that's one of the beauties of the opportunity for the new building. One, to have a research-capable building, that we can bring our faculty back together in the same space so that we're not spread all over campus. And that we can also more seamlessly integrate our activities and research and teaching and engagement. That will be really exciting, having our undergraduate research projects in that same building.

The top ranking ... communicates that excellence that we know we have. And the consequences of that are the types of students that seek us out at the undergraduate and graduate level. We don't have to work as hard to recruit the best students. The best students, the best faculty, the best visiting scholars want to come and be

a part of Purdue ABE because there's this documented history of excellence. So we don't have to argue that we're excellent — it's just known that we're excellent. And that really attracts the best people. And that's what having a top-notch department is all about. On all levels of teaching and research, it's really attracting the best people and letting them do their thing.

JENNA RICKUS
Associate Department Head,
Professor



Weiss, Srinivasan join Distinguished Ag Alumni list

The Purdue Distinguished Agricultural Alumni Award is presented by the College of Agriculture to mid-career Purdue Agriculture graduates who have made significant contributions to their profession, or society in general. ABE is proud to have a number of previous awardees. For the full listing, visit purdue.ag/abe-dist-alumni.

K.E. (Karl) Weiss, vice president of Caterpillar Inc. with responsibility for the Earthmoving Division, was named a Distinguished Agriculture Alumnus in 2016.

Weiss started with Caterpillar in 1992, at the Decatur, Joliet, and Aurora, Illinois, facilities, primarily focused on large machine structural design. Later he transferred to Geneva, Switzerland, with Caterpillar Global Mining, as an Equipment Management Consultant, then became the Large Wheel Loader New Product Introduction Manager in Aurora. He and his family spent four years in Beijing, where Karl served as the Wheel Loader Product Manager for the Asia Pacific Region and managing the integration of Shandong Engineering Machinery as Caterpillar's entry into the China WL market. Most recently Weiss was the worldwide product manager for Medium Wheel Loaders in Aurora. In 2013, the Caterpillar Board of Directors named him a vice president in the Earthmoving Division.

Weiss, a native of Hagerstown, Indiana, graduated from Purdue University in 1992 with a Bachelor of Science in agricultural engineering. He earned an MBA from Northern Illinois University in 1999. Karl serves on the Board of the YMCA of Metro Chicago, and volunteers at Crossroads Christian Church, The Heses House, and Feed My Starving Children.

Raghavan Srinivasan, PhD '92, was named a Distinguished Agriculture Alumnus in 2015. He is an internationally recognized authority on watershed modeling. The Soil and Water Assessment Tool (SWAT), developed by a team of researchers that included Srinivasan, is used in every state in the country and around the world to evaluate agricultural production practices and the impact of watershed management strategies on water quality.

He was part of the original SWAT development team, and he has published 158 papers in peer-reviewed articles that include major contributions to the model and its application to a wide variety of water resource problems. He has also published 11 book chapters and 105 articles in conference proceedings.

Recently, a journal publication ranked Srinivasan as having the second greatest impact on nonpoint source pollution modeling in the past 20 years. The only person who has had a greater impact in that period was Jeff Arnold, PhD '92, primary developer of SWAT, who was named a Purdue Distinguished Agriculture Alumnus in 2008.

Srinivasan said Department Head Bernie Engel has a profound impact on his career. "He has been a big influence on my education, my career, and my life. Dr. Engel has guided me to success from the first time I arrived in the United States from India in 1989. When I arrived, I really didn't have much of any expectations of myself regarding what I was capable of doing in the field of agricultural engineering. I learned a lot simply by watching how he conducted himself both professionally and as a human being. I was his first doctoral graduate student to graduate at Purdue. Over the years, we have continued the relationship we started at Purdue and have developed many successful programs together."

"If I had to do it all over again, I would choose Purdue, without any doubts."

Srinivasan was not aware of Purdue when he first came to the United States to attend graduate school. He felt fortunate to be able to meet so many world-class researchers and leaders in various disciplines. "Looking back, everyone who studied with me has turned out to be very good at what they do and has achieved great heights in each of their professional careers. If I had to do it all over again, I would choose Purdue, without any doubts."



2016 Outstanding Alumni

Each spring, the ABE Department presents the Outstanding ABE Alumnus Award. The award is based on significant contributions or marked success and is typically given mid-career. The 2016 honorees:

MARK BOWERS, BS '03

The Brookville, Ohio, native graduated with a focus on Power Machinery and began working for John Deere as a test engineer. He supervises the Current Product Harvest Module team.

NATHAN FLECK, BS '03, MS '05

The Ag Systems Management graduate had two internships with Monsanto, and since 2015 he has been with the company's Global Engineering team as the Seed Process Engineering Group Lead. The team manages the process design for all capital projects that support Row Crop and Vegetable Seed Operations.

JILL E.K. GOUGH, BS '98

She's a New Production Introduction Team Leader at Caterpillar Inc., with responsibility for bringing Caterpillar Mining Machine, locomotive and industrial 3500 engines into production. Gough began as an operations line supervisor, then went on to manufacturing engineering and logistics. She came to the Lafayette plant as an Engineering Team Leader focused on the C175 Engine Platform production introduction.

Above, from left: Kevin King, Mark Bowers, Joe Miller, Nathan Fleck, David Guntrip, and Jill Gough.

DAVID GUNTRIP, BS '91

He has been with Abbott Laboratories for 13 years and is a Senior Principal Process Engineer for Abbott's nutrition business in Columbus, Ohio. Guntrip also worked for ConAgra, where he led a research team in developing a co-extrusion process for Slim Jim's snack meats.

KEVIN KING, BS '91, MS '92

He's a Research Agricultural Engineer and Research Leader with the USDA-Agricultural Research Service, Soil Drainage Research Unit in Columbus, Ohio. He is leading and collaborating on multiple projects aimed at quantifying edge-of-field water quality effects of agricultural production practices in the Eastern Corn Belt.

JOSEPH MILLER, BS '03, MS '14, MBA '14

A Regional Sales Director for Case IH NAFTA, he lives near the family farm in Rochester, Indiana. He has held several positions with CNH Industrial in service, parts, and sales. In May 2015, Joe was promoted to his current position.

We invite your nominations for future honorees. See our website purdue.ag/abe-outstanding-alumni or contact Carol Weaver at cmweaver@purdue.edu.



Senior Capstone Experience — nothing ‘mock’ about it

One reason Purdue’s ABE program remains atop US News & World Report rankings is the highly respected Senior Capstone Experience series. Our ASM students take ASM 49400, Project Planning and Management, and 49500, Agricultural Systems Management. Our AE students take ABE 48400, Project Planning, and ABE 48600, Senior/Capstone Design. BE students take ABE 55700 and ABE 55800 with Professor Okos as the culmination of their undergraduate education.

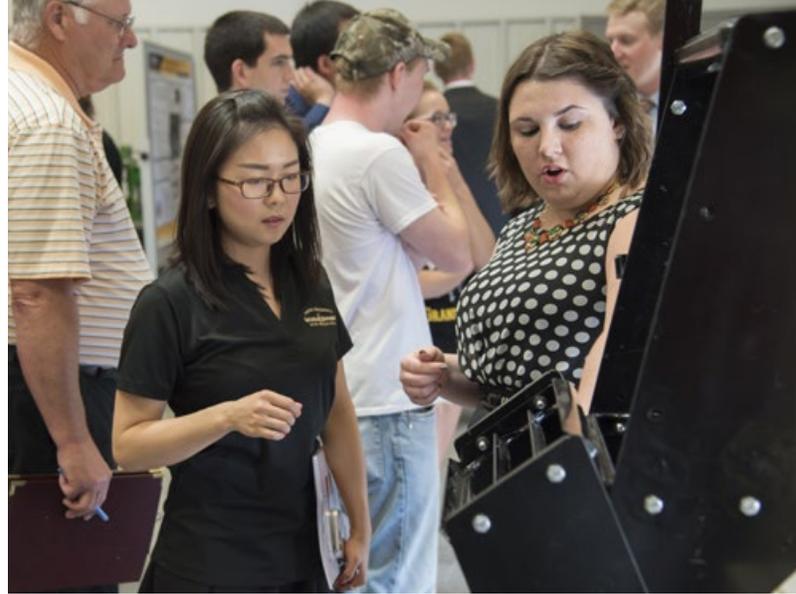
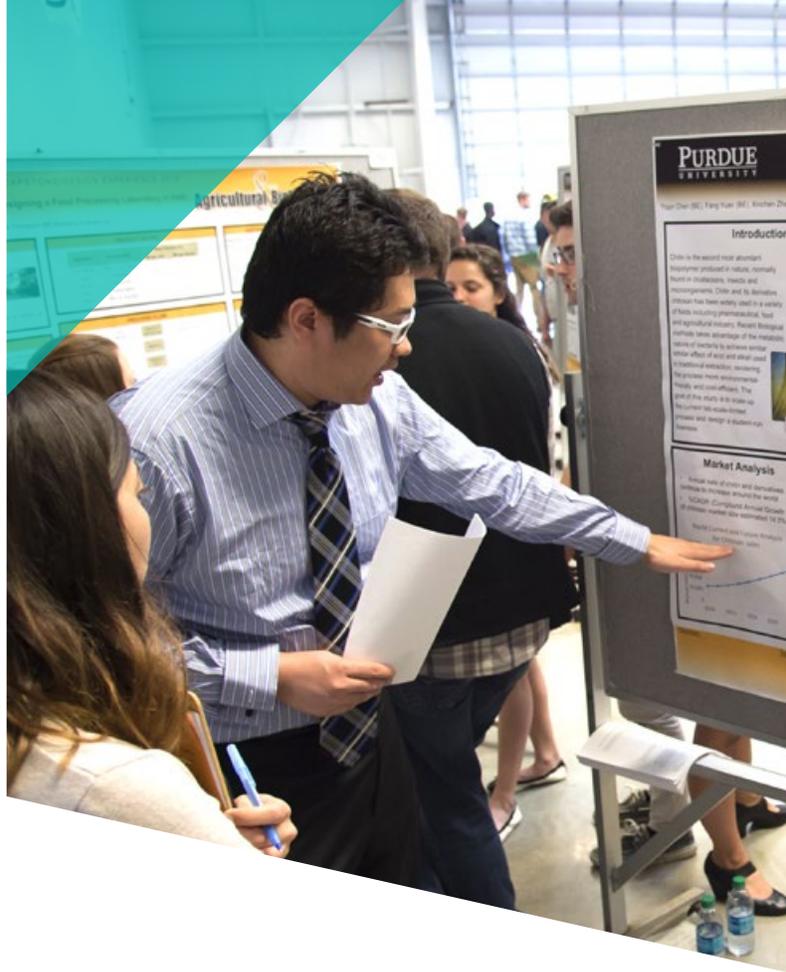
Most of the projects begin with a problem. Teams of students uncover, research, and implement their solution to the problem. Over the past 13 years, students have worked on diverse projects, such as food supply and preservation in developing countries, and the Purdue Utility Platform vehicle, which can plow, pump and carry water, act as a school bus or ambulance, grind maize, and can be built using parts available locally. Innovations in precision farming, machinery modifications for more practical use, water reclamation and control in

public areas are just a few of the ideas that have been developed and refined, many times by more than one team over the course of several years.

Professor Robert Stwalley presented the program at the 2016 ASEE Capstone Conference meeting in Columbus, Ohio. The conference paper is being expanded into an article for an ASEE special publication. The presentation was also published in the ASABE Resource Special Issue, September/October 2016.

An article published in *Purdue Alumni News Connections* in June 2015 described the program this way:

Senior students in Purdue University’s Department of Agricultural & Biological Engineering got a sense for the professional work they might encounter after graduation by completing semester-long projects that demonstrate the knowledge they have accumulated in pursuit of their bachelor’s degree. The Purdue ABE Senior Capstone Project



course begins in the spring, when students choose projects from a list, some proposed by companies in the agricultural industries (such as John Deere), farmers looking for a management solution, or Purdue professors pursuing a project.

Students displayed their final products toward the end of the spring semester during a public showcase at the ADM Agricultural Innovation Center. Projects included a combine attachment that collects harvest-loss data, a new process developed to extract lipids from insects, and a garlic planter designed specifically for organic farmers.

Joel Waterman, a senior from Noblesville, Indiana, majoring in agricultural systems management, designed a dynamometer that recycled two pieces of ABE-owned equipment to make a modified machine able to take power readings from tractor tires.

"It's definitely different from just sitting in class, hearing a lecture and taking down notes," Waterman said. "It takes less in the way of book smarts and more in the way of street smarts and being able to think on your feet and coming up with a solution."

There's nothing "mock" about the course. Many of the projects research product issues that can surface from use of new farm equipment. One group took on a project for John Deere, designing a mechanism that would allow farmers to transport the combine head without having to use a separate cart. If implemented, the design would save time and fuel. The project was conceptual, but the design will be given to John Deere and perhaps be built as part of a Capstone project in the future. Heading the project were Garrett Meents of Monticello, Indiana, and Kyle Trabert of Columbia City, Indiana, both ASM students.

"I thought it was interesting, the whole process involved with the design," Trabert said. "It wasn't what I expected — there's a decision for each step and a calculation. Most people don't realize all the steps involved."

Meents was impressed with the opportunities the course provided. "You get to see how things work in the real industry," he said. "But at the same time, if something bad happens, we're still under the protection of our professors. I enjoyed it because it's ongoing. You get to do something new every week, and that was interesting."

What will ABEs think of next?

Robert E. Stewart Engineering-Humanities Award

Paul Lengemann, who is working on his master's degree with ABE professor Meng Deng, received the Robert E. Stewart Engineering-Humanities Award. It honors a current graduate or undergraduate student for contributions to the profession and the humanities (ASABE). The award was established in 1986 by Bonnie Stewart as a tribute to her husband, Robert, a McCormick medalist, past president, and Fellow of ASAE.

Purdue Utility Platform (PUP)

A lack of affordable transportation and strenuous work from manual agricultural practices prevents many smallholder farmers in sub-Saharan Africa from moving on from subsistence living. In 2009, the African Center for Renewable Energy and Sustainable Technology (ACREST) contacted Purdue to collaborate on a design that would answer the need for a sustainable solution that addressed transportation and agricultural challenges in Cameroon. This collaboration, which is now expanding beyond Cameroon, spawned the Purdue Utility Platform.

The PUP, a multipurpose utility vehicle powers an array of attachments and implements, including water pumps, maize grinders, planters, threshers, and generators. Additional models are currently being developed, including a miniPUP and an electric driveline option (ePUP) that can utilize renewable sources of energy.

Team alumni have started a company to partner with organizations in Ethiopia, Kenya, and Nigeria to scale-up manufacturing. For more information, email David Wilson at dwilson@mobileagpower.com.





Student Soybean Innovation Contest winners

The Student Soybean Innovation Contest is designed to encourage students to exercise their knowledge and skills by creating new industrial products from soybeans. Working in teams with faculty advisors, students brainstorm product ideas, create a production timeline, conduct patent searches, develop a market analysis, document the technical process of creating their product/material, design packaging, and market their product or material.

The contest, sponsored by the Indiana Soybean Alliance, has been creating new markets for soybeans for more than 20 years. A number of those ideas have reached commercialization, including the original contest winner – the soybean crayons (1995). Prang bought the rights to those and continues to market them. Other innovative products have included candles, ski wax, and a flexible, lightweight, low-cost substrate for electronic circuits.

This year's winners were announced at the industry event held March 22 at the Indiana Roof Ballroom and included several teams with ties to ABE. SoyPods placed third. The team members were Andrew Cameron (Chemical Engineering), Xuan (Anna) Luo (ABE) and Harshit Kapoor (Civil Engineering), and Kelly Blanchard (Management) and Nate Mosier (ABE) were the advisors. The People's Choice Award was won by Evan Anderson (ABE), Dylan Lowden (Environmental & Health Sciences), and Sara Richert (Public Relations) for their Sparked by Soy fire starter.

For more information: purdue.ag/soybean-winners

Quarter-Scale Tractor Pulling Team

Purdue was first in the maneuverability category and 12th overall in ASABE's 2016 International Quarter-Scale Tractor Student Design Competition. Daniel Skelton, ABE's undergraduate teaching lab manager, said recent results "have been a bit disappointing," but in 13 years of competition, the team has six top-five finishes: second in 2007, third in 2011 and 2009, fourth in 2005, and fifth in 2014 and 2010.

Meet some of our Outstanding Students

2016

Candace Popp graduated Agricultural Engineering, with a focus in Machine Systems, and earned a minor in Management. She is the 4th generation on her family's farm. She participated in the Purdue Quarter Scale Tractor Pulling Team and the ASABE chapter. Candace was active on campus as a College of Engineering Ambassador, a two-year executive board member for Purdue University Dance Marathon, and as a host for the Old Masters program. Since graduation, Candace has been working for John Deere in the engineering developmental program.



Ed Babinec graduated in ASM with a minor in Farm Management. He was involved in the Purdue Trap and Skeet team, Indiana Farm Bureau and Indiana Young Farmers through Farm Bureau, and ASM Club. He interned for ADM during his sophomore and junior summers and is working full time for ADM in Toledo, Ohio, as a Maintenance Supervisor Trainee.

Jaycey Hardenstein graduated with a degree in biological engineering and a minor in chemistry. She conducted research in the Laboratory of Renewable Resources Engineering on food pathogen detection and also tutored underclassman in engineering and natural science courses. While interning at NASA Ames Research Center in the Space Biology Division, she designed a neonatal habitat for future experiments on the International Space Station. Last summer, she interned at Eli Lilly and Co. and began her career at Eli Lilly this summer as a manufacturing scientist in the insulin manufacturing department.



Mark Aronson is a senior in Biological Engineering on the biomolecular and cellular engineering track. He is the former president of the iGEM bioengineering team, an undergraduate researcher in the Rickus lab, and a Resident

Assistant in Shreve Hall. He plans to pursue a Ph.D. in synthetic or systems biology. Mark participated in the Amgen Scholar program at Columbia University in New York, performing tissue engineering research in the Hung lab.

Zane Gottschalk is pursuing a degree in Agricultural Engineering with a concentration in Machine Systems. He also plans to earn a Certificate of Entrepreneurship and Innovation through the Krannert Business School. He is involved with the Grand Prix Junior Board and the Formula SAE team, and is a member of Alpha Gamma Rho Fraternity and the Purdue Society of Professional Engineers. He plans to work in the agricultural industry, designing and manufacturing equipment.



Casey Martin is a senior pursuing a degree in Environmental and Natural Resources Engineering and a minor in Natural Resources and Environmental Science. She is involved with the Purdue iGEM team, Karate Club, and Society of Women Engineers and has been an officer in iGEM and Karate Club. She has had an internship with the iGEM team and a SURF internship with Dr. Hoagland in the Horticulture Department. She is continuing the horticulture research this year, investigating how microbes help defend plants from parasites. She plans to earn a master's degree in Environmental Engineering and go into the consulting field.



Davis Jeffries is pursuing a degree in Biological Engineering with a focus on Food Processing. He is a member of the ABE Biological Ambassadors, a small-group leader for IGNITE, and a member of Alpha Tau Omega Fraternity. Last summer, through a Purdue Study Abroad program, he traveled to Europe and learned about food production in Spain. During a spring break, he performed missionary work on a farm in Cuba. Davis spent last summer in Le Sueur, Minnesota, working in research and development with Davisco Inc.



Robert "Levi" Bays is pursuing a degree Agricultural Engineering with a specialization in Machine Systems, a minor in Engineering Leadership, and a certificate in Entrepreneurship and Innovation. Interning with John Deere for a second time this summer, he worked on a design team improving future combine separation and cleaning systems. He's been a member of the Purdue PUP team, Big Brothers Big Sisters of Lafayette, and Fairway Cooperative.

Growing up on a farm, **Will Field** has always had a firsthand account of the many aspects of agricultural life. He is majoring in Agricultural Systems Management and plans to work in the ag equipment industry. Will is a member of the ASM Club, Alpha Mu Honor Society, and the Purdue Trap and Skeet Club.



As a fourth-generation grain and livestock farmer, **Derek Neuhoff** was inspired by his father's words: When you enjoy what you are doing, it won't seem like work. He is majoring in Agricultural Systems Management and pursuing minors in Food and Agribusiness Management and Crop Science. He participates in the Agricultural Technology & Innovation Learning Community and the ASM club and was named the national winner in the 2015 FFA Proficiency Award in Diversified Crop Production Placement. He has been on mission trips in various states. After graduation, he intends to return to the family farm and use his knowledge to increase grain production.

Cole Mundell is pursuing an ASM degree, minoring in Crop Science and Farm Management. His family owns and operates a 1,200-acre farm of corn, soybeans, and wheat along with two farrow-to-finish hog buildings in Sharpsville, near Kokomo. Upon graduation, Cole plans to either get a job in the equipment industry, grain industry, or return back home to help operate the farm; he would be the sixth generation in his family to do so. Cole is a member of the Alpha Gamma Rho Fraternity, ABE Ambassadors, Alpha Mu Honors Society, and ASM Club.





Going above and beyond

Andrews Fellowship

for the recruitment of outstanding PhD-track students to graduate programs at Purdue University

Julia Burchell

Bilsland Dissertation Fellowship

provides support to outstanding PhD candidates in their final year of doctoral degree completion

Shule Liu, Garrett Pignotti

Ross Fellowship

for the recruitment of outstanding PhD-track students to graduate programs at Purdue University

**Elizabeth Wachs,
Gabe Wilfong**

Purdue Doctoral Fellowship

supports the recruitment of outstanding PhD-track students who will enhance the diversity of the graduate student body in graduate programs at Purdue through their diverse backgrounds, views, and experiences

Jessica Zuponic

Magoon Award

outstanding teaching assistants in memory of Estus H. and Vashti L. Magoon, who have influenced the lives of many engineering educators early in their careers through this award

**Shawn Ehlers,
Malithi Wickramathilaka**

College of Engineering Outstanding Service Scholarship

presented to engineering graduate students who have provided outstanding service to the graduate student community, the Department, the College, and/or the University

Sanoar Rahman

College of Engineering Outstanding Researcher Award

students who have demonstrated excellence and leadership in research through publications, participation in professional organizations, and willingness to mentor others

Yi Cui

Teaching Academy Graduate Teaching Award

honors graduate students with teaching responsibilities from across campus for their dedication to Purdue students and their outstanding teaching contributions

Malithi Wickramathilaka

ABE Outstanding MS Student

recognizes outstanding achievement by ABE graduate students in the areas of research, academics, and service

Min Xiao

ABE Outstanding PhD Student

recognizes outstanding achievement by ABE graduate students in the areas of research, academics, and service

Md. Shahriar Karim

Students whose work gets noticed

Graduate students

Anne Dare

PhD, EIT, ASABE New Faces of Engineering

Andi Hodaj

Outstanding NRES Student Presenter

Amanda Montgomery

Outstanding NRES Student Presenter

Carlington Wallace

Outstanding NRES Student Presenter

Jennifer Kahn

Emily M. Wadsworth Graduate Mentoring Award

Clifford Racz

ASABE Blue Ribbon Award

Rachel Sparks

2nd place, ninth annual Ecological Sciences and Engineering Symposium

Darren Seidel

2nd place, 58th annual Association of Environmental & Engineering Geologists

David Orrego

1st place, third annual ABE GSA Industrial Research Symposium

Jingqiu Chen

2nd place, third annual ABE GSA Industrial Research Symposium

Andi Hodaj

3rd place, third annual ABE GSA Industrial Research Symposium

Andrew Robison

NSF Grad Research Fellowship

Samira Fatemi

Honorable Mention, NSF Grad Research Fellowship

Achint Sanghi

2nd place, Purdue Innovation to Design Expo

Kaliramesh Siliveru

best presentation, texture technologies, 2015 American Association of Cereal Chemists International

Gabriella Mendes Candido de Oliveira

2nd place, Conference of Food Engineering 2016 Poster Session

Undergraduates

Xuan (Anna) Luo

team member, 3rd place, Student Soybean Product Innovation Competition

Evan Anderson

People's Choice Award, Student Soybean Product Innovation Competition

Jordyn McCord

Emily M. Wadsworth Undergraduate Mentoring Award, Student Responder at Graduation

Helena Lysandrou

top research poster, SURF

Will Field

2015 Rossville FFA Members/American FFA Degree

Danielle N. McNeely

the France A. Córdova Award for Leadership in Action (honors graduating students who have demonstrated exceptional leadership during their Purdue careers. The students must have held successful leadership roles at Purdue, working in partnership with staff and faculty to move the university forward, while maintaining a minimum 3.0 GPA)





ABE Ambassadors spread the word

Our newest student organization, ABE Ambassadors, spreads awareness and recruits for the department. One way the Ambassadors accomplish that is by hands-on activities and labs for junior high and high school students. The Ambassadors also work with 4-H and FFA members, as well as the First Year Engineering, Women in Engineering and Minority Engineering programs at Purdue. Labs and presentations are tailored to the various audiences. From pneumatic tennis ball launchers to DNA extraction to learning about and controlling UAVs and environmental cleanup, the Ambassadors call attention to ABE's diverse programs.

The Ambassadors recently hosted a group of high school students from ITW Speer Academy in Chicago. (Photos above.) "I just really want to reach out again and say thank you for such an amazing trip," wrote Jordan Kruger, director of STEM education at the charter school on the near north side. "Our students have been buzzing about it the entire way back and have been asking me questions about engineering. Thank you for everything today. You were all extremely accommodating and worked so hard to teach our kids."

Graduate symposium puts focus on innovation

David Orrego (Bioenergy), Jingqiu Chen and Andi Hodaj (both Environment & Natural Resources) were first through third, respectively, in the poster session competition at the third annual ABE Graduate Industrial Research Symposium.

More than 160 graduate students participated in the February 2016 event, which promoted networking and career opportunities. There were 55 student posters — faculty, postdocs and visiting scholars did the judging — and 16 oral presentations. The theme was Ingredients for Innovation. Nick Gray, Director of Strategic Projects at Dow AgroSciences, and Sabine Brunswicker, an Associate Professor of Innovation and Director of the Purdue Research Center for Open Digital Innovation, were the keynote and plenary speakers, respectively.



Planning is underway for the 2017 Symposium, set for Thursday, Feb. 16.

For more information, contact:
*Dr. Abigail Engelberth aengelbe@purdue.edu or
Julia Burchell jburchel@purdue.edu.*

Scholarships

The Agricultural & Biological Engineering department continues to be able to support students with scholarships, due to the many donors who have established endowments. Donors include individuals and families. We are grateful that our students are recognized in a tangible way. At our Spring Student Awards Banquet in April, we were able to award \$118,000.

For a complete listing, visit:
purdue.ag/abe-scholars.

If you are interested in honoring someone with a scholarship, please contact Joel Hartman at jbhartman@prf.org or (765) 494-4785.





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Purdue University is an equal access/equal opportunity institution.



Stay in touch

We are always looking for news about our alumni and friends. Please send updates and news items to Carol Weaver, cmweaver@purdue.edu.

purdue.edu/ABE