

PENN STATE ENGINEERING CONNECT

The intersection of industry, university, and government



MESSAGE FROM THE DEANS

From Dean Schwartz

We are very proud to share with you the inaugural issue of the Penn State College of Engineering industry newsletter.

While I have only been Dean for a very short time, I am excited to see our College emphasizing relationship-building with industrial partners of all sizes.

Industry partnerships will play a key role in long-term success. The Penn State strategic plan identifies six foundations that underpin all that we do:

- Enabling Access to Education
- Engaging Our Students
- Fostering and Embracing a Diverse World
- Enhancing Global Engagement
- Driving Economic Development
- Ensuring a Sustainable Future



Our industry partners have an important role in each of these foundations. Within the College of Engineering, we aim not only to continue to lead in 21st Century engineering education while

performing world-class research, but also to ensure that we have an impact on society. We recognize that we can only meet these aims through strong industrial relationships.

In the coming few years we look to expand the breadth and depth of our industrial partners network. Our students understand that internships enhance their education in ways that complement the classroom, and we need our industry partners to provide these opportunities. In research, our faculty are at-the-ready to assist with the real-world challenges that exist across the engineering disciplines, while also looking to translate their own breakthroughs into products.

Over the past 30 years, many of my own research successes are the result of collaborations with both large and small business, and in the past few years I have co-founded two companies. Through these experiences, I have gained insight into the unique challenges faced by industry in a competitive global marketplace, and also developed an understanding that each industrial partner has its own unique culture. Thus, establishing successful partnerships requires not only mutual interests technically, but an investment into building strong relationships. We, at the Penn State College of Engineering, are dedicated to building successful relationships that are mutually impactful in the short- and long-term.

I hope you will enjoy this newsletter, and more importantly, I hope we can work together soon.

From Senior Associate Dean Atchley

The College of Engineering values our long-standing industry partnerships and welcomes the opportunity to strengthen them. We also seek to form new partnerships with companies who have not worked with us on research before. Partnerships range from modest levels of support for faculty members or graduate students to make very specific measurements or do limited analysis over a period of several months to years, to multi-investigator collaborations on longer-term advanced technology development. Some of our most successful partnerships began as the former and evolved into the latter as we got to know one another better and learned how working together is mutually beneficial.



We understand that many companies come to us because we produce great students who will be highly successful in the workplace. However, we believe that as a comprehensive research-intensive University, Penn State and the College have quite a bit more to offer to companies. Partnering with us on research projects accomplishes several goals. It provides an opportunity for a company to have the College's faculty members and students apply forefront methods and techniques, often not available within a company, to their problems. The outcomes increase both the company's competitiveness and the University's economic impact, in support of our land-grant mission. Since the majority of our students (both undergraduate and graduate) accept jobs in industry after graduation, exposure to industrial research and development while they are students prepares them better for their future careers. Exposure to these types of problems also gives our faculty members practical experience that will make them better able to connect textbook concepts to challenges that students may face. Finally, it is increasingly common for federal agencies to favor public-private partnerships in addressing society's most pressing problems.

It is important to point out that the University stands behind our goal of expanding industry partnerships. In fact, it has made a major change in its approach to the ownership of intellectual property resulting from industry funded research to make it easier to work with us. Read more about it [here](#).

The College of Engineering is working on several outreach initiatives aimed at informing industry of our capabilities, and inviting you to partner with us. One such outreach initiative was our inaugural industry engagement workshop, industryXchange, held this past spring. Listed below are some companies that benefitted from attending industryXchange and are working on research collaborations with our faculty.

We invite you to learn more about us and the industry-friendly environment at Penn State by contacting Priya Baboo, director of industry, innovation and development, via email at pzb104@psu.edu or phone at 814-863-9142.



The College of Engineering is
LOOKING FOR
INDUSTRY SPONSORS
for Capstone Design projects

SPRING 2018 PROJECT SUBMISSION DEADLINES:
Early deadline: Friday, November 24 (\$250 discount)
Final deadline: Friday, December 8

[LEARN MORE >>](#)

RESEARCH COLLABORATIONS

Learn more about this issue's featured research partnerships by clicking on one of the links below:

- [Bechtel Corporation](#)
- [Dow Chemical Company](#)
- [LORD Corporation](#)
- [Pratt & Whitney](#)

Bechtel Corporation

About Bechtel

Bechtel is one of the most respected global engineering, construction, and project management companies. Since 1898, Bechtel has completed more than 25,000 extraordinary projects across 160 countries on all seven continents. Bechtel operates through four global businesses: infrastructure; nuclear, security & environmental; oil, gas & chemicals; and mining & metals.



Research Focus

- Rail transportation engineering
- Building information modeling
- Concrete design

Partnership Background

Bechtel recruits from many colleges at Penn State. Within the College of Engineering, they typically focus on mechanical, chemical, nuclear, civil, architectural, and electrical engineering. Bechtel provides scholarships to the College of Engineering and other colleges at Penn State. They are a sponsor of The Gursahaney Family E-Knowledge Commons within the Department of Mechanical and Nuclear Engineering. Bechtel also contributes to several advisory groups for the Harold and Inge Marcus Dean of Engineering, including the advisory board for the Center for Engineering Outreach and Inclusion and the advisory board for the Engineering Leadership Development Program within the School of Engineering Design, Technology, and Professional Programs.

Engagement Level with Penn State

- Recruiting
- Philanthropy
- Research

Penn State Connectors at Bechtel

Christopher Putman, Senior Plant Design & Piping Engineer

Mr. Putnam holds an M.A.E. (mechanical option) from the Department of Architectural Engineering at Penn State and is a registered professional engineer in the state of Maryland. At Bechtel, he works in the Plant Design and Piping discipline, which is responsible for physical layout of process and power plants and piping and valve specifications, requisitions, and technical support. He began his Bechtel career during summer internship positions every summer throughout college, and ultimately began full time with Bechtel after graduating from Penn State in 2011. During his time at Bechtel, he has worked on multiple solid fuel, combined cycle natural gas, concentrating solar, and small modular nuclear power projects. Most recently, he has begun working in Bechtel's Rail and Infrastructure business line, as well as innovation in project execution and Virtual Project Delivery.

Dr. Javeed Munshi, Principal Engineer and Concrete Design Specialist

Dr. Munshi is a Bechtel Distinguished Engineer (BDE) and a Bechtel Fellow. He received his B.S. in Civil Engineering from National Institute of Technology and M.S. in Earthquake Engineering from the Indian Institute of Technology, Roorkee, India. He received his Ph.D. from Illinois Institute of Technology, Chicago. Dr. Munshi has over 20 years of experience in design, evaluation, and construction of concrete structures including heavy industrial (fossil, nuclear and renewable) power structures, bridges, buildings, underground structures (tunnels), and environmental concrete structures. Dr. Munshi is a licensed professional engineer in New York and Wisconsin, and a licensed structural engineer in Illinois.

Faculty Collaborators Based on Discussions During industryXchange



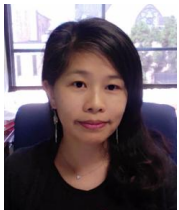
Dr. John Messner, Professor, Architectural Engineering
Research Focus:

- Implementing Building Information Modeling (BIM) to improve design and construction
- Leveraging advanced visualization approaches, including virtual and augmented reality, to improve facility project delivery
- Developing workflows and information standards for facility asset data management

Dr. Hai Huang, Associate Professor, Engineering
Research Focus:



- Transportation infrastructure evaluation, monitoring, and prediction by using Sensing Mechanism and Real Time (SMART) computing
- Development of advanced wireless sensor networks for construction of new transportation infrastructure (i.e. metro) and monitoring of aged transportation infrastructure (i.e. railroad bridges)



Dr. Shihui Shen, Associate Professor, Rail Transportation Engineering Research Focus:

- Transportation infrastructure material: design and characterization
- Intelligent compaction and Smart construction
- Asphalt tracked and modules remediation material for railroad track structure
- Pavement evaluation and performance monitoring

Dow Chemical Corporation



About Dow

Dow combines the power of science and technology to passionately innovate what is essential to human progress. The company is driving innovations that extract value from material, polymer, chemical and biological science to help address many of the world's most challenging problems, such as the need for fresh food, safer and more sustainable transportation, clean water, energy efficiency, more durable infrastructure, and increasing agricultural productivity. Dow's integrated, market-driven portfolio delivers a broad range of technology-based products and solutions in high-growth sectors such as packaging, infrastructure, transportation, consumer care, electronics, and agriculture.

Research Focus

- Advanced and sustainable manufacturing
- Analytical techniques to characterize materials, their morphologies, and performance
- Connecting the structure of materials to their properties through multi-scale modeling and experimental design

Partnership Background

Dow has a robust, long-standing, strategic relationship with Penn State that they are continuing to build. Dow has many connection points with Penn State through a regular presence on campus, on-going collaborative relationships, and the network of alumni in Dow.

Engagement Level with Penn State

- Recruiting
- Philanthropy
- Research

Penn State Connector at Dow

Dr. Gretchen Baier, Associate R&D Director of External Technology

The Dow External Technology Group is responsible for identifying and facilitating sponsored research with universities, research institutes, and other external partners around the world. The team also is responsible for creating a pipeline of R&D collaborations with government agencies and laboratories and developing win-win partnerships. This runs the gamut from user facilities at federal labs, to CRADAs, to WFOs, to winning competitive grants and cooperative agreements, to participating in university research centers, among others.

Currently, Dr. Baier chairs the Advisory Board of the Critical Materials Institute, a Department of Energy Innovation Hub, with a mission to assure supply chains of materials critical to clean energy technologies, enabling innovation in U.S. manufacturing and enhancing U.S. energy security. She co-leads the Project Committee for the University-Industry Demonstration Partnership organization and is a member of the Industrial Research Institute. Prior to joining Dow, Dr. Baier was a Process Engineer at Dow Corning Corporation and later at Shell Oil

Company. She has a Ph.D. in Chemical Engineering from the University of Wisconsin at Madison, a B.S. from M.I.T., and is a licensed Professional Engineer.

LORD Corporation



About LORD

LORD Corporation is a diversified technology and manufacturing company developing highly reliable adhesives, coatings, motion management devices, and sensing technologies that significantly reduce risk and improve product performance. For more than 90 years, LORD has worked in collaboration with its customers to provide innovative oil and gas, aerospace, defense, automotive, and industrial solutions.

Research Focus

- Testing of new concepts (passive rotor balancing, fluidic pitch links, rotor stand testing, material advancements, etc.)
- Development and improvement of predictive models to increase our design capability and reduce test iterations, (material models, component models, integrative models of our parts in their end use structures, etc.)
- Advancement of additive material capabilities

Partnership Background

LORD has a long-standing relationship with Penn State. LORD recruits heavily from Penn State Behrend and moderately from University Park. LORD supports the Vertical Lift Research Center of Excellence (VLRCE), has 1-2 LORD Graduate Student Fellows in the Aerospace Department, funds the annual Rotor Day event, and sponsors 1-2 Senior Design projects at University Park. At Behrend, LORD sponsors 3-6 senior design projects a year, awards multiple LORD Scholarships, supports career building events (resume prep sessions, mock interview training, industry panels, etc.), and engages many students in internships. LORD currently collaborates with several faculty members at both University Park and Behrend, including a long relationship with Dr. Ed Smith in the Department of Aerospace Engineering that has produced LORD hires and many valuable research findings. LORD is in the process of kicking off a series of new projects, some of which were established based on interactions at the industryXchange.

Engagement Level with Penn State

- Recruiting
- Philanthropy
- Research

Penn State Connector at LORD

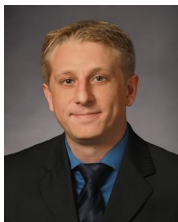
Dr. Conor Marr, Manager, Mechanical Technology Development and Product Improvement Engineering

Dr. Marr leads the Mechanical Technology Development team with the goal of advancing technology, design, and predictive capabilities in LORD products. He also leads the Product Improvement Engineering team, which targets improving aftermarket parts and incorporating new technology to directly help the end user. Dr. Marr graduated from Penn State with his Ph.D. in Aerospace Engineering and has 10 years of experience working in the rotorcraft industry on various technology development projects, including embedded sensing, CFD development, and multi-state lead-lag damper design and modeling. He currently leads the PSU-LORD interface for research collaboration and senior design projects.

Faculty Collaborators Based on Discussions During industryXchange

Dr. Michael Hillman, L. Robert and Mary L. Kimball Assistant Professor,
Civil and Environmental Engineering
Research Focus:

- Computation solid mechanics
- Meshfree particle methods



- Large deformation analysis

Dr. Namiko Yamamoto, Assistant Professor, Aerospace Engineering
Research Focus:



- Experimental studies on advanced multi-function materials for aerospace applications, including polymer nanocomposites, ceramics, and metals
- Enable bulk applications of nano- and micro-engineered materials

Pratt & Whitney

About Pratt & Whitney

Pratt & Whitney, a United Technologies Corp. (UTC) company, is a world leader in the design, manufacture and service of aircraft engines and auxiliary power units.

Partnership Background

Pratt & Whitney and UTC have had a robust partnership with Penn State to develop student programs and facilities, support research and develop innovative technology. In 2008, Pratt & Whitney enhanced this longstanding relationship with Penn State by establishing a Center of Excellence, which sponsors research in such areas as gas turbine engines, acoustics and advanced materials. In 2013, Pratt & Whitney furthered the relationship with an investment to create the Steady Thermal Aero Research Turbine (START) laboratory, the country's most advanced turbine testing facility.



In addition to research sponsorships, UTC has provided philanthropic support for the Engineering Ambassadors program, a professional development program in which Penn State students inspire young people to consider careers in engineering. Pratt & Whitney also maintains a strong recruiting presence at Penn State and have hired numerous Penn State graduates. The strong relationship between Pratt & Whitney/UTC and Penn State can be regarded as an industry benchmark.

Critical to this successful relationship is the vision and drive of Dr. Karen Thole, Distinguished Professor and head, Department of Mechanical and Nuclear Engineering. Without her leadership and constant nurturing, this relationship would not have been possible. Penn State is an integral part of Pratt & Whitney's research development and recruiting plans.

Engagement Level with Penn State

- Recruiting
- Philanthropy
- Research

Penn State Connector at Pratt & Whitney

Dr. Atul Kohli, Fellow - Heat Transfer, Analytical Methods

Dr. Kohli leads the proficiency improvement of practitioners and the incorporation of state-of-art analytical methods for prediction of heat transfer into the design process. In his 19 years at Pratt & Whitney, Dr. Kohli has held positions of increasing responsibility within Turbine Aerodynamics, Multi-Disciplinary Optimization, Turbine Durability and Aero-Thermal Systems disciplines.

As the technical focal point for the P&W Center of Excellence at Penn State, Dr. Kohli works closely with students and faculty on various research projects. He has more than 30 refereed publications, 15 issued patents, and more than 30 patents pending. Dr. Kohli serves as a Champion at P&W for the Asian American Leadership Forum and was elected an ASME fellow in

2009. Atul has a B.S. in mechanical engineering from the Indian Institute of Technology and a M.S. and Ph.D. in mechanical engineering from the University of Texas at Austin.

Faculty Collaborators Based on Discussions During industryXchange



Dr. Tim Simpson, Paul Morrow Professor in Engineering Design and Manufacturing
Research Focus:

- Additive manufacturing and 3D printing
- Engineering design and optimization
- Product family and product platform design
- Mass customization



Dr. Mary Frecker, Professor, Mechanical and Nuclear Engineering
Research Focus:

- Optimal design
- Compliant mechanism
- Smart structures
- Medical device design
- Design for additive manufacturing



PennState
College of Engineering

STAY CONNECTED:



Penn State College of Engineering, 101 Hammond Building, University Park, PA 16802

[SafeUnsubscribe™ {recipient's email}](#).

[Forward this email](#) | [Update Profile](#) | [About our service provider](#)

Sent by partnerships@enr.psu.edu in collaboration with



Try it free today