2026 ANNUAL REPORT

JULY 1, 2025 - JUNE 30, 2026

RAY W. HERRICK LABORATORIES



PURDUE UNIVERSITY | Ray W. Herrick Laboratories

HOME OF **THE CENTER FOR HIGH PERFORMANCE BUILDINGS** &
PURDUE BIOFUELS CONSORTIUM



HERRICK LABS

2026 ANNUAL REPORT

PURDUE UNIVERSITY | Ray W. Herrick Laboratories

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DIRECTOR'S INTRODUCTION



GREG SHAVER

Dear Herrick Family and Friends,

It has been another extraordinary year at the **Ray W. Herrick Laboratories**. I continue to be inspired by the dedication, talent, and collaborative spirit of our students, staff, and faculty. Their collective efforts have resulted in remarkable achievements, including nearly 100 awards, honors, and promotions this past year alone, a testament to the excellence that defines the Herrick community.

As Director, I have the privilege of working alongside our administrative and technical leadership teams, led by Lea Greathouse and Professor Eric Holloway, to support more than 40 faculty-led research groups across the laboratories. Together, these teams partner with industry leaders, government agencies, community organizations, and foundations to advance knowledge, solve complex engineering challenges, and prepare the next generation of innovators and leaders.

One of the most rewarding aspects of our work is hearing from employers and collaborators about the exceptional preparation, motivation, and impact of Herrick graduates. Through faculty mentorship and hands-on research experiences, our students develop the technical expertise, creativity, and leadership skills needed to thrive in an increasingly complex world. The research investments and engagement provided by our sponsors and partners make this possible, enabling us to recruit outstanding students, support groundbreaking research, and launch some of the finest engineers produced by any program in the world.

Your partnership, generosity, and commitment to the Herrick mission are essential to our continued success. On behalf of our faculty, staff, and students, thank you for your support and belief in what we do. We also welcome your ideas, perspectives, and involvement as we continue to grow and strengthen the Herrick community.

As a part of the School of Mechanical Engineering, the Herrick Laboratories remains one of the foundational research communities within the College of Engineering. Purdue Engineering continues to be recognized as one of the nation's premier engineering programs, a distinction driven in large part by the research excellence, innovation, and real-world impact of faculty-led teams across the college, including those that my team supports right here at the Herrick Labs.

Thank you for joining us on this journey. Together we are advancing discovery, developing future leaders, and creating solutions that improve lives around the world. We are grateful for your partnership and look forward to building on this momentum in the years ahead.

Boiler up...and Hammer down!

Greg Shaver
Reilly Professor of Mechanical Engineering
Director, Ray W. Herrick Laboratories
Director, Smart Crossroads Consortium
Purdue University
Fellow ASME, Fellow SAE

RAY W. HERRICK LABORATORIES

AT A GLANCE

The Ray Herrick Laboratories, founded in 1957, is part of the School of Mechanical Engineering. The 44 Mechanical, Civil, and Electrical Engineering faculty who do research here collaborate on interdisciplinary research projects with faculty in the other Schools of Engineering and also with faculty in the College of Science, College of Health and Human Sciences, and the Purdue Polytechnic Institute. There are five main technical areas of research with some overarching themes related to energy utilization and efficiency, reduction of pollutants in the environment, quality of life, and sustainability and safety.

THE MAIN TECHNICAL AREAS ARE:

- High Performance Buildings, Thermal Systems, Air Quality, and Clean Water
- Noise and Vibration Control, which includes research on Acoustics, Dynamics, and Structural Vibrations
- Electromechanical Systems and Advanced Engines: Controls, Signal Processing, Sensing, Estimation, Diagnostics, and Prognostics
- Perception-Based Engineering: Modeling of Human Response for Machine and System Optimization
- Manufacturing and Advanced Materials
- Robotics
- Automation

The educational experience at Herrick combines the traditional training of aspiring researchers with exposure to industrial, governmental, and societal needs. Nearly 1,000 Masters and Ph.D. candidates have graduated from the Ray W. Herrick Laboratories.



Technology transfer to industry partners and disseminating through peer-reviewed publications, conferences, and short courses is an integral part of a majority of the research programs at Herrick Labs. The researchers are also widely published across the spectrum of publications from academic journals to the popular press.

MISSION
An institution dedicated to graduate education through engineering research with an emphasis on technology transfer.

VISION
To overcome the barriers between knowledge creation, transfer, and utilization for the advancement of society.

GOALS

1. Grow educational outreach activities, including fundamental, applied, and experimental short courses;
2. Build on research excellence in the following research areas: Noise and vibration control, integrated thermal and power systems, the built environment, and structural mechanics;
3. Provide the educational environment of the labs so that its graduate students are multi-disciplinary engineers who rate as the top engineering graduates in the country;
4. Recognize and promote the value of Herrick through effective brand management (internally and externally);
5. Efficiently use our facilities;
6. Continue recruiting top faculty, grad students, and staff to ensure long term stability and growth. Maintain world-class facilities.

FY 2026 HIGHLIGHTS

RESEARCH - FISCAL YEAR	FY2026
Research Expenditures	$13,050,000

STUDENTS	
Graduate Student Researchers	244
MS	67
Ph.D.	177
Undergraduate Student Researchers	86
Post-Doctoral Researchers	12

STUDENTS GRADUATED	
MS	15
Ph.D. / Post Doc	15

VISITING RESEARCHERS	
Visiting Research Assistants	8

PURDUE DAY OF GIVING

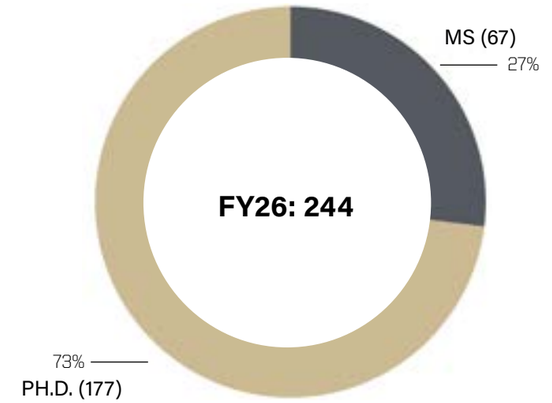
Thank you to our global community of Purdue alumni, friends, faculty, staff, retirees, students, parents, and fans. In the same way that every giant leap starts with one small step, every gift made on Purdue Day of Giving adds up to create a meaningful and lasting impact. During the 2026 Day of Giving the University raised an astounding $95,456,146 from over 34,000 gifts!

HERRICK PROGRAMS & DEMOGRAPHICS

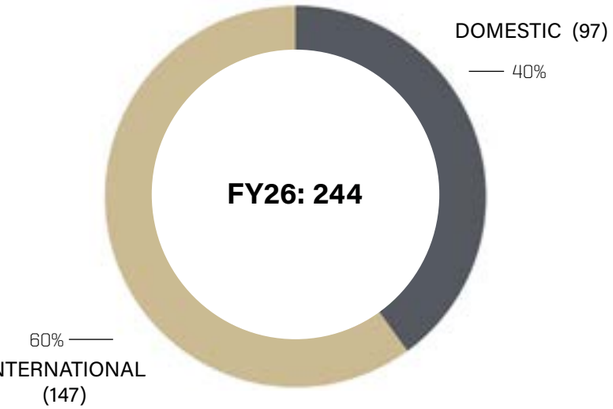
The primary educational mission at Herrick is thesis-based graduate programs and studies. We believe that the experiential learning, the open-ended, and integrative nature of thesis-based research is an outstanding preparation for both academic and industrial careers. To complement the student/advisor relationship, Herrick offers a learning community to the student. This community includes an outstanding cohort of graduate students, as well as a staff prepared to support and teach. In many cases, the student's research is sponsored. Sponsor representatives also participate in educational activities with the student. There are also opportunities for students to do internships in industry or government laboratories. In total, Herrick provides an outstanding educational opportunity for our graduate students.

HERRICK PROGRAMS & DEMOGRAPHICS

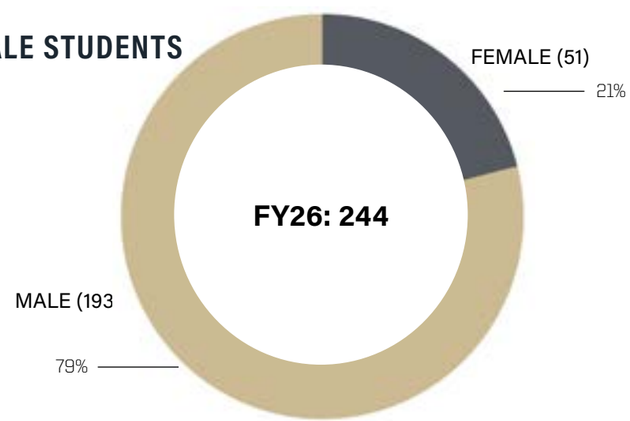
MASTERS & PH.D. STUDENTS



DOMESTIC & INTERNATIONAL



MALE & FEMALE STUDENTS



HERRICK SPONSORS

TOP FEDERAL SPONSORS

2026

TOP 4 INDUSTRIAL SPONSORS

2026

In FY 2026, 36% of the research funds came from industry partners.
The top 4 industrial sponsors are shown above.

HERRICK STUDENT AWARDS

AND SUCCESSES


ESQUIVEL-PUENTES

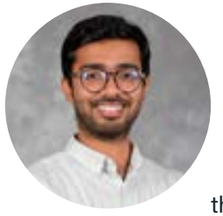

KIM


MAH

Three recent Herrick graduates have chosen to pursue careers in academia, set to begin in the fall of 2026: **Antonio Esquivel-Puentes (Postdoctoral advisor, Groll)**, Tenure-Track Assistant Professor within the Ira A. Fulton Schools of Engineering at Arizona State University, The Polytechnic School, in the Clean Energy Systems Program; **Kitae Kim (Cappelleri)**, Tenure-Track Assistant Professor, North Carolina State University, Department of Biological and Agricultural Engineering; and **Dongjun Mah (Tzempelikos)**, Tenure-Track Assistant Professor, Department of Civil, Environmental, and Architectural Engineering at the University of Kansas.


YUH

Madeleine Yuh (Jain) was selected as a 2025 Rising Stars in Mechanical Engineering at the Rising Stars in Mechanical Engineering Workshop hosted at Massachusetts Institute of Technology (MIT). She joined a cohort of participants invited to the event which is geared toward graduate students and Ph.D. holders considering future careers in academia. The workshop focuses on building professional skills and connecting participants with peers and mentors.


PRIYADARSHAN

Priyadarshan (Kircher) is the recipient of the **Bilsland Dissertation Fellowship**. This fellowship is designed to allow final-year doctoral students the opportunity to devote full-time efforts into finishing their dissertation and research. **Priyadarshan** also won the Doctoral Talk Runner-Up at the Computational Interdisciplinary Graduate Program (CIGP).

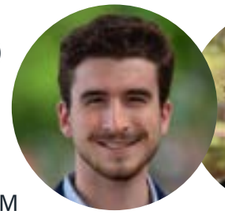
HERRICK STUDENT AWARDS

AND SUCCESSES

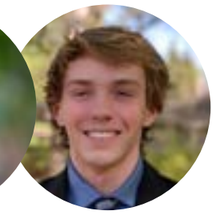


BOLT

Maxwell Bolt (Bilionis) was selected by the School of Mechanical Engineering as a recipient of the **William E. and Florence R. Perry Graduate Teaching Fellowship**. This fellowship is given to exceptional graduate students in the school who show strong promise and excellence in academic instruction and teaching.



DIERKING



WASSGREN

Grant Dierking (Kircher/Ziviani) and **Benjamin Wassgren (Bilionis)** were two students selected for the **National Science Foundation's Graduate Research Fellowship Program (NSF GRFP)**. The NSF GRFP recognizes outstanding graduate students in NSF-supported STEM disciplines who are pursuing research-based master's and doctoral degrees.



REYES PREMER

Levi Reyes Premer (Kircher/Ziviani) has developing technology to enable more intelligent demand response for electric water heaters. This innovation could save utility companies money by protecting local power transmission equipment. Levi disclosed the intellectual property (IP) to Purdue Innovates Office of Technology Commercialization, which has applied for a patent to protect the IP.



STONE

Amanda Stone (Ziviani/Weibel) had the honor of presenting her work and also sharing her personal inspirational journeys at multiple conferences. Amanda traveled to Orlanda, FL where she presented her work, "Characterization, Modeling, and Experimental Setup of 3D Printed Polymer Composite Laminate Morphing Structures" at the five-day AIAA SciTech Forum.

As an active member of Society of Women Engineers (SWE), Amanda attended the WE Local Austin 2026 conference and was selected to speak. She revealed how she personally bridges two distinct paths in her life (music and engineering) in her talk entitled, "Composing Balance: How Music Shapes My Engineering Journey."

HERRICK STUDENT AWARDS

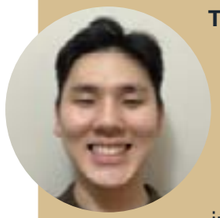
AND SUCCESSES

HERRICK FELLOWSHIPS / ASSISTANTSHIPS



HAN

The William E. Fontaine Memorial Fellowship was established in memory of **Bill Fontaine**, the founding Director of the Ray W. Herrick Laboratories, for the purpose of providing support for graduate student research to attract the nation's most promising students. To receive these prestigious awards, a student must a candidate for the M.S. or Ph.D. degree, and be doing, or intending to do, thesis-based research on a problem of interest to industry exclusively at the Ray W. Herrick Laboratories. The applicant may be a candidate for the M.S. or Ph.D. degree. The 2026 recipient for the Fontaine Fellowship is **Changwoo Han (Gibert)**.

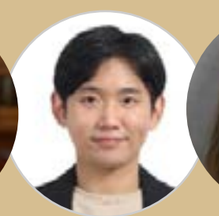


CHUNG

The William Uffman Graduate Student Fellowship in Mechanical Engineering was established by **William Uffman** to provide support for graduate students doing research through the Herrick Laboratories. The recipient of the Uffman Fellowship for 2026 is **Joshua Chung (Williams).** To receive this prestigious awards, a student must be doing, or intending to do, thesis-based research on a problem of interest to industry exclusively at the Ray W. Herrick Laboratories. The applicant may be a candidate for the M.S. or Ph.D. degree.



MIRFARAH

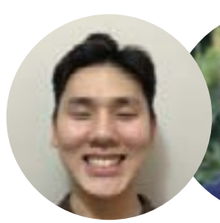


OH



PATTERSON

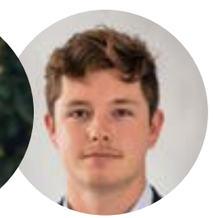
The **2026 Herrick Labs Assistantships** have been awarded to the following students: **Motahareh Mirfarah (Dyke)**, who's research primarily focuses on habitats; **Hajin Oh (Li)**, who's research focuses on ice formation on outdoor heat exchangers in heat pump systems; and **Jennifer Patterson (Ciez)**, who's primary research focus is on abatement strategies for greenhouse gases.



CHUNG



COOKE



DORRELL

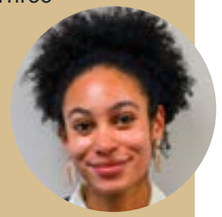
Presidential Excellence Award Fellows have been awarded three Herrick first-hear Ph.D. students: **Joshua Chung (Williams)**, **Wesley Cooke (Williams)**, and **Treyton Dorrell (Holloway)**.

HERRICK STUDENT AWARDS

AND SUCCESSES

2026 ASHRAE GRANT-IN-AID AWARD WINNERS

The ASHRAE Grant-in-Aid award is a prestigious $10,000 award given to outstanding graduate students performing research in the High Performance Buildings or HVAC&R fields. These grants encourage advanced studies in HVAC&R and will help winners explore innovative energy solutions. Three students receiving the award this year are:



CROSS

Jordan Cross (Jung), Civil Engineering and Herrick Labs PhD student, received the 2025-2026 Grant-in-Aid award for her research on indoor air quality and how everyday consumer products emit chemicals that shape the air people breathe in homes, offices, classrooms, and other indoor environments where people spend the majority of their time.



MAGNUSON

Brian Magnuson (Boor), Civil Engineering and Herrick Labs PhD student, received the 2025-2026 Grant-in-Aid award for his research project titled, "Atmospheric Nanoparticle Growth Dynamics with the Application of Whole-Room Far-UVC Radiation."



YANG

Yuanzhi Yang (Ziviani) Herrick Labs PhD student, received the 2025-2026 Grant-in-Aid award for her project focused on advanced HVAC systems for commercial buildings in cold-climates, supported by the U.S. DOE



MOSSALAEI

Kia Mossalaei (Braun/Horton) receive the **Willis H. Carrier Award** from ASHRAE in recognition of his conference paper, "Laboratory Evaluation of Control Verification Procedures for Certification of Variable-Speed Heat Pumps."

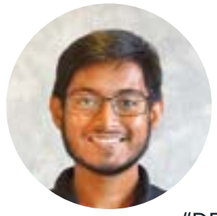
HERRICK STUDENT AWARDS

AND SUCCESSES

Jaewon Park (Weibel/Ziviani) received the **ITherm 2026 Best Paper Runner-Up Award** for his paper titled "Evaluation of Flow and Heat Transfer in Morphologically Blended Porous Unit Cells for Advanced Heat Exchangers with Functionally Graded Designs" at the Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm).

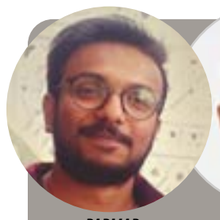


PARK



DEB

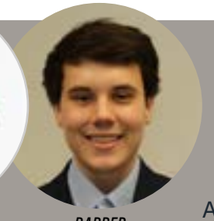
Aarya Deb (Cappelleri) had the opportunity to present three papers at the 2026 IEEE International Conference on Robotics & Automation (ICRA) in Vienna, Austria. "Autonomous Robotic Platform for Agricultural Robot Fleet Operations," "DRILL - autonomous ground robot system for deploying and reading biodegradable soil moisture sensors in the field, enabling low-cost and scalable soil moisture monitoring without human intervention," and "P-AgNAV" - a navigation framework designed by **Kitae Kim** for autonomous agricultural robots, enabling robust traversal across unstructured crop environments.



PARMAR



LEBLANC



BARBER



HOESS



BRAMMANAYAGAM VENKATESAN

Five Herrick students had the honor of presenting their latest research at the International Energy Agency (IEA) Heat Pump Conference in Vienna, Austria. **Ganesh Brammanayagam Venkatesan (Barta)**, **Yash Parmar (Groll)**, **Andrew LeBlanc (Barta)**, **Jonathan Barber (Ziviani)**, and **Andreas Hoess (Groll)** as the keynote.

HERRICK STUDENT AWARDS

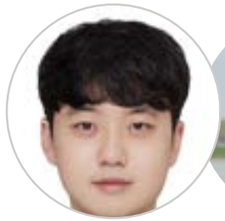
AND SUCCESSES



JEEVANANDAM

Sibibalan Jeevanandam (Jain) presented his work titled "A Reachability-Oriented Approach to Linear System Identification under Unknown Bounded Noise" at the ACC American Control Conference 2026 in New Orleans, LA.

Juhyung Kim (Liu), Hajin Oh (Li), and **Yijie Zhang (Li)** had the opportunity to present their work at the Acoustical Society of America and Acoustical Society of Japan Sixth Joint Meeting in Honolulu, Hawaii.



KIM



OH



ZHANG



FARHA

Aaron Farha (Groll) won the **Graduate Student Grant-in-Aid Award** from the American Society of Heating, Refrigeration and Air-Conditioning Engineers.

Aaron Farha received the **Lambert Graduate Teaching Fellowship**, which will fund him to act as the professor for an undergraduate course.



KHABBAZI

Arash Jalil Khabbazi (Kircher) was the runner-up winner in the **Best Ph.D. Forum Competition** for his presentation on "Field Demonstration of Advanced Commercial HVAC Control for Scalable Deployment" at ACM BuildSys! (The Association for Computing Machinery's International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation).



ADDIS

Clark Addis (Arrieta) had the opportunity to present his work, as he was the speaker during a talk titled Assessing Isometry in Curved-Creased Origami at the American Physical Society Global Physics Summit in Denver, CO.

HERRICK STUDENT AWARDS

AND SUCCESSES



PARK

Vismay Vyas (Jain) attended the SciTech AIAA, 2026 conference in Orlando, FL, where he had the opportunity to present his work, Graph-Based Dynamic Modeling of a PAO Loop for Aircraft Thermal Management Systems.

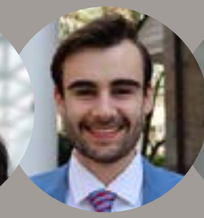
Five students who perform work at the Jain Research Lab were invited to present during the Herrick Conferences. Those students include: **Demetrius Gulewicz (Jain)**, **Isha Bayad (Jain)**, **Joseph Broniszewski (Jain)**, **Yash Mathur (Jain)** and **Vismay Vyas (Jain)**.



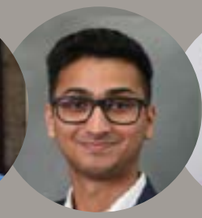
GULEWICZ



BAYAD



BRONISZEWSKI



MATHUR



VYAS



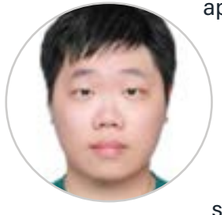
BRAMMANAYAGAM VENKATESAN

Ganesh Brammanayagam Venkatesan (Barta) was awarded first place in the Herrick Conferences Compressor Conference Student Paper Competition for his research on low-GWP refrigerant-lubricant mixtures for ultra-low temperature refrigeration.



NAIR

Siddharth Nair (Semperlotti) received the 2025 Leo Beranek Medal from the Institute of Noise Control Engineering - USA (INCE-USA). This award was to recognize his work focusing on cutting-edge, AI-driven computational acoustics and structural mechanics applications.



YU

Jinghe Yu was one of five students to win the **Student Paper Awards** at NOISE-CON. This Award is among the most prestigious honors presented at NOISE-CON and highlight the incredible talent and creativity of students who are shaping the future of noise control.

FACULTY SUCCESS STORIES

AND AWARDS



GROLL

Eckhard Groll, received a **Focus Award** for outstanding contributions to furthering Purdue University's commitment to advancing equal access to education, employment and recreation for individuals with disabilities. Dr. Groll led the charge to renovate the 100-year-old Mechanical Engineering Building with new elevators, restrooms, ramps, and 100% accessibility.



KIRCHER

Kevin Kircher was elevated to the rank of IEEE Senior Member, the highest grade that can be applied for directly within the IEEE, requiring significant experience and documented professional maturity.

NEWLY-ISSUED PATENTS

Congratulations to Herrick Faculty members who have received patents on their intellectual property from the United States Patent and Trademark Office:



LI

Gregory Shaver: "Firing Patern for Diesel Engine Dynamic Cylinder Activation"

Tian Li: "High Resolution Microfluidic Channel Fabrication Via Co-Phase Flow Enabled Additive Manufacturing"

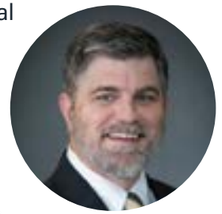


WARSINGER

Eckhard Groll: "Residential DC Nanogrid Systems";

David Warsinger: "Bimodal Reverse Osmosis and Pressure Retarded Osmosis Framework"; "Double-Acting Piston Batch Reverse Osmosis Desalination Assembly and Method"; "Vapor-Selective Nanostructured Membrane Heat Exchangers for Cooling and Dehumidification"; "Salinity Gradient Grade-Scale Energy Storage Method and Apparatus"

David Cappelleri: "Automated Systems and Methods for Agricultural Crop Monitoring and Sampling"; "Microrobot Control System and Method"



SHAVER



GROLL



CAPPELLERI

FACULTY SUCCESS STORIES

AND AWARDS



TZEMPELIKOS

Thanos Tzempelikos has been named **ASHRAE fellow** during the ASHRAE conference in Las Vegas, NV.



JUNG

Nusrat Jung, Assistant Professor in Purdue University's Lyles School of Civil and Construction Engineering, has earned a **National Science Foundation (NSF) CAREER Award**. This award is NSF's most prestigious honor for early-career faculty who exemplify the role of teacher-scholars through outstanding research, excellent education, and their integration.

Nusrat Jung has also been elected Treasurer-Elect of the International Society of Indoor Air Quality and Climate (ISIAQ), the world's leading scientific society dedicated to indoor environmental quality research. Jung was elected through an international vote of the society's membership and will begin her service in June 2026. The position represents a four-year leadership commitment, including two years as Treasurer-Elect followed by two years as Treasurer, with service on the ISIAQ Board of Directors throughout the term.



DYKE

Shirley Dyke, Donald A. and Patricia A. Coates Professor of Innovation in Mechanical Engineering and Director of Resilient Extra Terrestrial Habitats Institute (RETHi) presented during the ASCEND 2026 in Washington D.C. Dr. Dyke discussed the work Purdue's RETHi does to explore lunar and deep-space habitat simulation testbeds and how tools such as HabSim, CDCM, and the HARSH cyber-physical testbed are helping in the study of fault detection, digital twins, communication delays, autonomous decision-making, and resilient recovery strategies for future Smart Habitats.



HASANZADEH

Sogand Hasanzadeh, Associate Professor of Civil and Construction Engineering, has been awarded tenure at the Lyles School of Civil and Construction Engineering.

FACULTY SUCCESS STORIES

AND AWARDS


BLATCHLEY


BOOR


DUERSTOCK


GONZALEZ

The College of Engineering recognized faculty, lecturers and other staff for outstanding dedication to teaching students

For the recognition, individual teacher averages were calculated based on six CIE teacher evaluation survey questions related to instructor effectiveness on a five-point scale in undergraduate or graduate classes in engineering with enrollments of 10 and above and 50% or higher response rates. Instructors with 75 percentile or higher evaluation scores in four groups — small, medium, large and very large courses — were recognized for the spring 2026 semester. Eight Herrick faculty members were named as **Outstanding Engineering Teachers**.

Those faculty members include:

Ernest Blatchley (CCE), **Brandon Boor** (CCE), **Bradley Duerstock** (BME), **Marcial Gonzalez** (ME), **Junfei Li** (ME), **Charles Krousgrill** (ME), **Shreyas Sundaram** (ECE), **Davide Ziviani** (ME).


LI


KROUSGRILL


SUNDARAM


ZIVIANI


CIEZ

Rebecca Ciez was named as an ACS Energy Letters' Women Scientists at the Forefront of Energy Research for her work, "Consequential Climate and Energy Analysis of Steel Electrification via Hydrogen Direct Reduction."


BARTA

Riley Barta received the Outstanding Faculty Member Award from Purdue University College of Engineering. The recipient of the award is nominated by the graduate students and selected by Purdue University Mechanical Engineering.

FACULTY SUCCESS STORIES

AND AWARDS


LI

Tian Li received the 2025 **KINGFA Young Investigator Award**. Her appraiser/evaluator quotes: *"[She] has made several pioneering first-time discoveries that have sparked new directions in the research and development of cellulose, wood, and mycelium, interfacing these renewable materials with broader areas of physical science.*

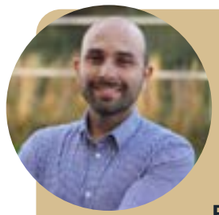
Tian Li was a featured presenter during Purdue College of Engineering's "Celebrating Our Associate Professors" series. Tian's incredible innovations serve to solve major environmental challenges. She shared with the audience her current research involving Ice-Wood, which has the unique capability to induce and accelerate ice formation in the oceans to combat melting polar ice caps.

DAVIES

During NOISE-CON 2026 in Long Beach, CA, **Patricia Davies**, Professor Emerita of Mechanical Engineering, and **Jinghe Yu**, Graduate Student, received the **Martin Hirschorn / IAC Prize (Best Paper) Award for 2026** for their paper "Improvements to methods to create realistic simulations of non-stationary vehicle wind noise for use in psychoacoustic tests" which was published in the Noise Control Engineering Journal in November 2025.

Marcial Gonzalez has been named a **2025 Teaching Academy Fellow**. Fellows are tenure-track faculty, clinical/professional faculty, lecturers, and senior lecturers who have distinguished themselves in teaching and were nominated by the Schools/Colleges and selected by the Executive Council of the Academy.


GONZALEZ


ARRIETA

Andres Arrieta and his team had the honor of participating in the first-ever Robotics Day at Purdue University. The team's poster titled "Physically Hybrid Automata: Soft Machines with Embodied Control" was awarded the **Audience Choice Gold (1st Place) Poster Award**.

FACULTY SUCCESS STORIES

AND AWARDS



WARSINGER

David Warsinger, Assistant Professor; **Clark Lay**, Graduate Student: The **Water Research Foundation (WRF) has awarded $170,000 in funding** to the Warsinger Water Lab's project, Advancing Non-Evaporative Cooling Technologies. The project aims to design cooling technologies that simultaneously minimize water consumption, energy consumption, and system costs to reduce economic barriers of implementing more sustainable HVAC systems in arid and semi-arid environments.

David Warsinger and his research team received $250,000 as a **semifinals of the Global XPRIZE Water Scarcity Competition**, which will be used to further develop their breakthrough desalination technology. Their system is designed to make seawater desalination more energy-efficient, affordable, and sustainable—helping address one of the world's most pressing challenges: access to clean water.

David Warsinger is known for teaching complex topics in unconventional ways — like demonstrating heat transfer by making solar s'mores. He was honored by the Purdue College of Engineering with an **Early Career Teaching Award**.

David Warsinger received the **PMSE Early Investigator Award** from American Chemical Society, aw highlights the accomplishments of early-career investigators who are emerging leaders in the field of polymer science and engineering, across academia, industry, and national labs.

David Warsinger spoke at the International Water Association's Conference in Daegu, Korea, where he received the **IWA MSTG Rising Star Award**.

FACULTY SUCCESS STORIES

AND AWARDS



DYKE

Shirley Dyke was elected a Fellow of ASME (The American Society of Mechanical Engineers).

Shirley Dyke and her research team are researching how to build the first reusable launchpads on the moon. In a paper published in Acta Astronautica from Dr. Dyke and her team, they describe how to build a lunar landing pad with just a minimal amount of prior knowledge of the material properties of the regolith used to build it.

Shirley Dyke attended ASCEND2026 and spoke on the panel of the AIAA Task Force on Lunar Surface Exploration and Development.



CAI

Jie Cai was awarded a **2025 Rising Star of Mechanical Engineering** through ASME at the International Mechanical Engineering Congress and Exposition (IMECE) for his project, "A Game-Theoretic Approach for Building Cluster Demand Response"



BOLTON

J. Stuart Bolton, Professor Emeritus of Mechanical Engineering, was awarded the **Rayleigh Medal** in recognition of his internationally renowned and sustained contributions to acoustics and noise control by the Institute of Acoustics.

Davide Ziviani was selected as one of 20 faculty across the College of Engineering to be part of the first Cohort of Emerging Research Leaders from the Purdue Engineering Office of Research and Innovation.

In the spring of 2026, **Davide Ziviani** received **The Ruth and Joel Spira Award** for outstanding contributions to the School of Mechanical Engineering for inspiring students and fostering excellence in commercial or defense product realization.

Davide Ziviani has also been appointed Co-Director of Geothermal and Natural Gas initiatives of the Purdue Institute of Energy Innovation.



ZIVIANI & GROLL

FACULTY SUCCESS STORIES

AND AWARDS



BOOR

Brandon Boor's research publication titled, "Fate of 1–6 nm Candle Combustion Nanoparticles in Indoor Atmospheric Environments" was published in Environmental Science & Technology, and "Integration of a Thermal Aerosol Generator into a Full-Scale HVAC Filter Test Rig for Aging Filters with Representative Urban Aerosol Size Distributions (RP-1734)" in Science and Technology for the Built Environment. The studies advance the understanding of ultrafine particles indoors and how building systems interact with real-world aerosols, offering critical insights for healthier, more resilient built environments.



TZEMPELIKOS

Thanos Tzempelikos is leading a $600,000 collaborative research project with Ball State University, sponsored by National Science Foundation, to will explore how tailoring natural light environments to the needs of children with Autism Spectrum Disorder could improve behavioral responses to better support learning, health, and well-being.



SHAVER

Gregory Shaver is featured in the Indiana Public Media article titled, "E15 gasoline usable for most vehicles as Congress considers year-round access." Dr. Shaver expresses the safety of using E15 gasoline in most passenger vehicles manufactured in 2001 or later as well as the cost-effectiveness of using it and benefits to American farmers. https://www.ipm.org/news/2026-06-02/e15-gasoline-usable-for-most-vehicles-as-congress-considers-year-round-access



CAPPELLERI

Dave Cappelleri and his team have designed a 3D-printed tumbling microrobots that can successfully deliver targeted medication exactly where needed in the body.

Dave Cappelleri has designed a force-sensing miniature robot, called a mobile microgripper (MMG), to handle spheroids with care, allowing force-sensing MMG the safe bioassembly of different spheroids into a single construct.

FACULTY SUCCESS STORIES

AND AWARDS



KARAVA

Panagiota Karava and the NextHouse team are engaging with manufacturers, builders, developers, and technology companies to identify where housing construction productivity falls short and where advanced manufacutring can improve in the way it has the automobile and aerospace industries. The Purdue Engineering Office of Research and Innovation is co-developing the initiative alongside the NextHouse team.



ARRIETA

Andreas Arrieta together with lab members, **Juan Camilo Osorio Pinzon** and **Jhonatan Rincon**, developed soft robots that use Mechanical Intelligence to walk and grip without a single onboard chip or battery. The "logic" in the robots is embedded in the geometry of the structure rather than a fragile circuit, allowing the robots to be resilient even after significant physical damage and in environments where traditional electronics simply can't survive—from deep-sea exploration to high-radiation zones. The work was featured in ASME (The American Society of Mechanical Engineers) Magazine.



GOLDENSTEIN

Chris Goldenstein and his team have developed a method to measure the tiny amounts of electrochemical gaseous by-products produced in lithium-ion batteries by using infrared lasers. The team wanted to detect these gases in a brand-new battery during the 'formation cycle', when it is first charged in the factory rather than waiting to the end of its life, hoping to engineer better batteries.



BARTA ZIVIANI

Riley Barta and **Davide Ziviani** had an overview of the Herrick Labs A3 refrigerant testing capabilities published in the HPT TCP - Technology Collaboration Programme on Heat Pumping Technologies by IEA Magazine. This article focused on techniques to safely and accurately characterize the performance of flammable refrigerants.

STAFF SUCCESS STORIES

AND AWARDS

STUDY ABROAD: ME STAFF JOINS STUDENTS ON INTERNATIONAL TRIP

Lea Greathouse, Managing Director, spent an incredible two weeks with Purdue University Mechanical Engineering students in Germany. Lea states, "It is very rewarding to watch our students expand their global perspectives. We immersed ourselves in world-class engineering, innovation, and culture across three incredible cities: Berlin, Stuttgart, and Karlsruhe."



FUELING THE NEXT GENERATION OF ENGINEERS! PURDUE UNIVERSITY MECHANICAL ENGINEERING STUDENTS RECENTLY TRADED THE WEST LAFAYETTE CAMPUS FOR THE AUTOMOTIVE CAPITAL OF STUTTGART, GERMANY, TO STUDY TWO TITANS OF GLOBAL ENGINEERING: PORSCHE AND MERCEDES-BENZ.





THE PURDUE UNIVERSITY ME GERMANY STUDY ABROAD VISITED THE UNIVERSITY OF HEIDELBERG. THIS IS THE HISTORIC GRAND HALL. WHAT AN AMAZING PLACE TO STUDY, WHERE SO MANY SCIENTIFIC DISCOVERIES WERE MADE, INCLUDING THE BUNSEN BURNER IN 1855.



ADLERSHOF BERLIN, GERMANY'S LEADING TECHNOLOGY PARK. THIS WIND TUNNEL, BUILT IN 1932 WAS USED FOR AERONAUTICAL RESEARCH.

STAFF SUCCESS STORIES

AND AWARDS



BAER *DALY* *GREATHOUSE* *NECHKASH* *SCOTT*

The College of Engineering honors staff members with **Bravo+ Awards.** The award recognizes employees who demonstrate excellence in advancing the university's mission through operational excellence, innovation and creativity, fiscal stewardship, and other significant contributions. The 2025-26 **Bravo+ Awards** went to the following Herrick Labs individuals: **Kyle Baer**, **Kimberly Daly**, **Lea Greathouse**, **Jordan Nechkash**, and **Vivian Scott**.



Kimberly Daly received the **Mechanical Engineering Staff Awards of Excellence - Mission & Core Values** for fostering a community that is open-minded and supportive of all.

DALY



A TRUCK CRUISES BY OSCAR, OPEN SOURCE CONNECTED AUTONOMOUS ROVER, ON HWY 52 NEAR PURDUE UNIVERSITY'S AGRONOMY CENTER FOR RESEARCH & EDUCATION (ACRE) IN WEST LAFAYETTE, IND. OSCAR RUNS ON AN ALGORITHM THAT ALLOWS IT TO DETECT AND MANEUVER AROUND OBSTACLES THAT WOULD TRIP UP OTHER AUTONOMOUS ROVERS ON THE MARKET. (PURDUE UNIVERSITY PHOTO/JOSHUA CLARK)

ROWMOW SIM: PURDUE AND INDOT COLLABORATE FOR SAFER HIGHWAY MOWING

Roadside mowing is inherently dangerous, time-consuming and costly.

The Indiana Department of Transportation (INDOT) spends approximately $18 million annually maintaining more than 40,000 acres of roadside vegetation. Contractors must often operate just feet from high-speed traffic, sometimes crossing into travel lanes and navigating around obstacles hidden in tall grass.

To address the challenges facing mower operators, INDOT partnered with Purdue on a research project funded through the Joint Transportation Research Program. Led by **John Evans**, assistant professor of agricultural and biological engineering (ABE) in Purdue's College of Agriculture and mechanical engineering (by courtesy) in the College of Engineering, the project explores whether autonomous mowing systems could improve safety and efficiency.



EVANS

HERRICK SUCCESS STORIES
AND HIGHLIGHTS

"Autonomous mowers for residential and light commercial use have been available for a while, but highway mowing presents fundamentally different challenges with highly variable terrain, tall vegetation that obscures obstacles and the need to operate safely next to high-speed traffic," Evans said. "

To build an effective testing environment, the research team first needed comprehensive data about actual mowing operations. Grad students in the Evans Lab mapped obstacle density patterns along roadsides. Using machine learning models, they analyzed datasets to identify common challenges, such as obstacles or instances when equipment entered travel lanes. The analysis revealed that mowers encroached on highways more frequently than expected, and vegetation height often concealed hazards.

"My lab has done a lot of work with cosimulation and codevelopment frameworks, using virtual environments to inform the physical world and vice versa," Evans said. "This allows us to speed up development on projects where real-world testing is limited."

The collaboration produced ROWMow Sim, a virtual digital twin of real Indiana roadside locations in a scalable testing environment. The program is built on Unreal Engine 5.1, which is the industry standard for physics in games like Fortnite and Gears of War.

The project also benefitted from cross-departmental collaboration with **Greg Shaver**, director of Ray W. Herrick Laboratories and the Reilly Professor of Mechanical Engineering. The team worked closely with Matt Kraushar, roadside maintenance specialist at INDOT, to provide updates and gather feedback on the project. https://ag.purdue.edu/news/2026/05/rowmow-sim-purdue-and-indot-collaborate-for-safer-highway-mowing.html



SHAVER

STORY BY ANNA O;NEILL ALEXANDER



NASA ASSOCIATE ADMINISTRATOR AMIT KSHATRIYA, CENTER, TOURS MEETS WITH PROF. SHIRLEY DYKE AND THE RETHI TEAM AT HERRICK LABORATORIES

NASA ASSOCIATE ADMINISTRATOR VISITS PURDUE, TOURS RESEARCH FACILITIES

WEST LAFAYETTE, Ind. — NASA Associate Administrator Amit Kshatriya visited Purdue on Tuesday (April 21) to learn more about the university's state-of-the-art research facilities that support key NASA programs.

Purdue's robust aerospace and planetary science ecosystem provides research strengths that span the entire arc of space systems and areas aligned with NASA's mission needs, including atmospheric entry, in-space propulsion, mission design, planetary surface exploration and human habitation. Kshatriya toured labs in the colleges of Engineering and Science that help advance high-impact research central to NASA's future missions. Across these labs, researchers study conditions associated with extreme flight environments to develop tools that make complex missions possible and advance technologies that support sustained human activity beyond Earth.

For instance, cutting-edge capabilities like hypersonic wind tunnels and rocket combustion test cells help generate data that inform hypersonic flight and propulsion in space.

HERRICK SUCCESS STORIES
AND HIGHLIGHTS

Purdue teams are also translating complex orbital mechanics into visual insights that support mission design and analysis, as well as operating instruments that interpret surface composition and contribute to real-time decisions on Mars rovers.

At the same time, researchers are performing experiments to explore how fluids and systems behave in low-gravity environments and are developing smart, autonomous deep-space habitats capable of operating far from real-time support on Earth.

Taken together, the work on display illustrates Purdue's role in contributing foundational research, validated technologies and systems-level insight across multiple phases of space exploration.

Kshatriya serves as the highest-ranking civil servant and chief operating officer at NASA. He leads the agency's 10 center directors as well as the mission directorate associate administrators at NASA headquarters in Washington, D.C.

In addition to touring research facilities, Kshatriya attended the inaugural Neil Armstrong Space Prize winner announcement. This transformative prize leverages Purdue's unparalleled space heritage, having produced numerous astronauts and developing pioneering aerospace education and research.

Known as the Cradle of Astronauts, Purdue has 30 alumni who have flown in space or been selected as NASA astronaut candidates. With the upcoming Virgin Galactic Purdue 1 suborbital flight mission, the university is set to send five more Boilermakers into space.

https://www.purdue.edu/newsroom/2026/Q2/nasa-associate-administrator-visits-purdue-tours-research-facilities/

STORY BY LINDSEY MACDONALD

STUDENTS DESIGN ACCESSIBLE TRANSPORTATION SOLUTIONS THROUGH THE CIVICPROGRESS CHALLENGE

The CivicProgress Challenge is a multi-year, virtual student design competition developed by SAE International in collaboration with General Motors. Student teams work with a GM-provided rolling chassis to explore real-world mobility challenges faced by wheelchair users and people living with disabilities. Through hands-on design and engineering, teams develop inclusive mobility solutions informed by industry expertise and direct community insights. The program emphasizes innovation, accessibility, and sustainable mobility while preparing students for real-world engineering challenges.

Brad Duerstock and Brandon Pitts are two professor of at the Purdue University Weldon School of Biomedical Engineering are leading a team of students that will be taking part in the SAE International Civic Progress Challenge, which will give students the opportunity to work on an inclusive autonomous vehicle design project, with their Origin Wave, the team's wheelchair accessible transportation.



HERRICK SUCCESS STORIES
AND HIGHLIGHTS



HERRICK PLAYS A KEY ROLE IN THE FIRST ROBOTICS DAY AT PURDUE

Purdue launched its first Robotics Day on March 26, together with the Purdue University Office of Industry Partnerships, and with representation from Colleges of Engineering, Science, Agriculture.

Herrick Labs plays a key role in Robotics at Purdue! With an emphasis in autonomous systems and human-machine interaction in a "Living Laboratory" environment, the labs serve as a hub where robotics research is applied to real-world challenges.

Our faculty and students' robotics research has forged paths from cornfields (P-AgBot), to transportation with the EASI Rider, Purdue AI Racing, all the way to space with Resilient Extra-Terrestrial Habitat (RETH) Institute!

Andres Arrieta and his team had the honor of participating in the event, where the team's poster titled "Physically Hybrid Automata: Soft Machines with Embodied Control" was awarded the **Audience Choice Gold (1st Place) Poster Award**.

Faculty whose teams were present were: **Shreyas Sundaram, Dave Cappelleri, Andres Arrieta, Brad Duerstock, Brandon Pitts, Yan Gu, Greg Shaver, Dan Williams, John Evans**.

HERRICK SUCCESS STORIES

AND HIGHLIGHTS



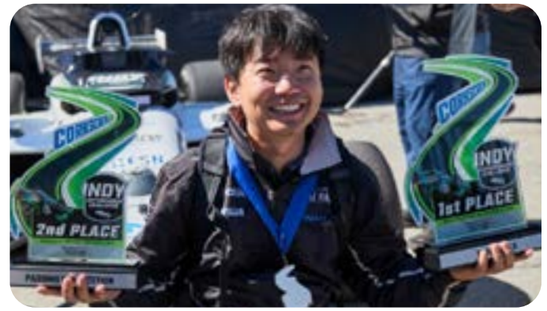
PURDUE AI RACING TEAM SETS TRACK RECORD AT LAGUNA SECA, PLACES SECOND OVERALL IN INDY AUTONOMOUS CHALLENGE RACE

Purdue Engineering is fueled by "firsts," and on Sept. 3, the Purdue AI Racing (PAIR) team contributed a milestone achievement to that long list. PAIR set a new track record and won first place in the time trials with a 1:27.731 lap, becoming the first autonomous car ever to beat 1:28 at WeatherTech Raceway Laguna Seca in Monterey, CA.

PAIR was the only American team to qualify for the Indy Autonomous Challenge's first-ever passing competition on a road course, a component that significantly elevated the level of difficulty.

In the end, the team earned a spot on the podium for the passing competition, finishing as the runner-up behind Unimore, an Italian team from University of Modena and Reggio Emilia.

"It was a great outcome for Purdue," **Greg Shaver**, Reilly Professor of Mechanical Engineering, said minutes after the race ended. "We had a lot of fans come out, and we're going to take home some hardware tonight, and we couldn't be prouder."



YUCHEN SONG HOLDS THE TEAM'S TIME TRIALS & PASSING COMP. TROPHIES FROM THE 9-3 INDY AUTONOMOUS CHALLENGE RACE. (PURDUE UNIVERSITY PHOTO)

Shreyas Sundaram, Marie Gordon Professor of Electrical and Computer Engineering and a faculty adviser for the team, concurred. "We're very pleased that we put up an incredible fight with the top teams in the world and earned our place among them," Sundaram said.

This race was uncharted territory for every team participating, Sundaram said. "We were nervous going in today. To run one car autonomously at Laguna Seca is complicated. Having two cars at those speeds with very tight spacings and no accidents out here today is just an incredible testament to how far our systems have come."

With PAIR recording the fastest lap of the race, Manuel Mar, sr. ops manager, said all of the long nights, coding, data review, programming and training paid off. "I want to thank the team, the faculty and the organizers. They were awesome this year."



PURDUE AI RACING TEAM MEMBERS REVIEW DATA ON LAPTOPS IN PIT AREA. SIMULATION WORK IN THE WEEKS BEFORE THE RACE HELPED THE TEAM IDENTIFY AND FIX SOFTWARE ISSUES AHEAD OF RACE DAY. (PURDUE UNIVERSITY PHOTO)

Before the race, team members had the opportunity to meet Seval Oz, assistant secretary for research and technology with the U.S. Department of Transportation. Oz served as grand marshal for the event and joined the Purdue team on the podium as they accepted their first- and second-place trophies.

https://engineering.purdue.edu/Engr/AboutUs/News/Spotlights/2026/2026-0904-purdue-ai-racing-sets-track-record-runner-up-laguna-seca

IN MEMORIUM

REMEMBERING HARSHAD INAMDAR: A LEGACY OF EXCELLENCE, CURIOSITY, AND SERVICE

The Ray W. Herrick Laboratories and the School of Mechanical Engineering at Purdue University mourn the loss of Harshad Inamdar, a distinguished alumnus, accomplished engineer, and valued member of the HVAC&R community, who passed away on September 2, 2026, at the age of 37.

Born in Pune, India, to Anuradha and Vijay Inamdar, Harshad demonstrated an exceptional passion for learning from an early age. After earning his bachelor's degree in mechanical engineering, he came to Purdue University in 2011 as a self-supported master's student. What began as a pursuit of advanced education soon became an extraordinary academic and professional journey marked by intellectual achievement, innovation, and lasting contributions to the engineering profession.

From the moment he arrived at Purdue, Harshad distinguished himself through his remarkable academic performance and commitment to excellence. His exceptional abilities, reflected in outstanding standardized test scores and graduate coursework, quickly identified him as a scholar of uncommon talent. He went on to pursue doctoral studies at Purdue University's School of Mechanical Engineering, where his research focused on air-side fouling in finned heat exchangers, a critical area of study within thermal systems and HVAC&R.

Following his graduate studies, Harshad joined Rheem Manufacturing, where he built a distinguished career that culminated in his role as Senior Principal Engineer. His technical expertise and innovative thinking earned him widespread respect throughout the HVAC&R industry. An active contributor to ASHRAE, the International Institute of Refrigeration (IIR), and other professional organizations, he played an important role in advancing heat transfer and thermal systems technologies. His accomplishments were recognized through numerous professional honors, including the AHRI Richard C. Schulze Award.



Yet Harshad's professional achievements tell only part of his story.

Those who knew him remember a person whose intellectual curiosity extended far beyond engineering. He approached life with enthusiasm, humility, and a genuine desire to learn. Whether studying new languages, learning to play the violin, practicing martial arts, hiking, traveling, or exploring unfamiliar cultures and ideas, Harshad embraced every opportunity for growth and discovery. Learning, for him, was not simply a means to an end but a lifelong pursuit fueled by wonder and curiosity.

Equally memorable was his character. Despite his many accomplishments, Harshad remained approachable, generous, and thoughtful. He freely shared his knowledge, encouraged colleagues and students, and inspired those around him through both his professionalism and his kindness. Friends remember a loyal companion; colleagues remember a trusted collaborator; and family members remember a devoted son and brother whose warmth and generosity enriched countless lives.

Purdue University Mechanical Engineering Head, Eckhard Groll, said of Harshad, "His dedication raised the standards of those around him. His optimism encouraged people to believe more was possible. His generosity inspired others to give more freely. His curiosity made those around him more curious. And his kindness made the world around him gentler."

To honor Harshad's memory and his passion for research and education, the Harshad Inamdar Memorial Fellowship has been established at Purdue University. The fellowship will support future graduate students conducting research in Thermal Systems and HVAC&R, helping to advance the field that Harshad cared about so deeply.

The fellowship represents a lasting tribute to a remarkable engineer, scholar, and friend. More importantly, it ensures that future generations of researchers will continue to benefit from the values that defined Harshad's life: intellectual curiosity, academic excellence, innovation, generosity, and a commitment to making a meaningful impact.

The Herrick Laboratories community is honored to have been part of his journey and remains grateful for the lasting legacy he leaves behind. Harshad Inamdar will be remembered not only for what he accomplished, but for how he lived: with purpose, humility, curiosity, and an unwavering commitment to learning and serving others.

https://giving.purdue.edu/west-lafayette/college-of-engineering-folder/gifts-in-memory-of-harshad-inamdar/

INDUSTRIAL ADVISORY COMMITTEE



2025 INDUSTRIAL ADVISORY COMMITTEE MEMBERS WITH HERRICK FACULTY, STAFF, STUDENTS (PHOTO: PURDUE UNIVERSITY/JARED PIKE)

The Industrial Advisory Committee is comprised of high level executives and managers from a variety of industries that have close ties to Herrick Labs. Since 1958, the Industrial Advisory Committee (IAC) has met with Herrick Laboratories at least once a year to review the Lab's previous year's operations and advises the faculty and Director on future plans. This is also an opportunity for the committee to facilitate research partnerships between industry and the Laboratories.

The record number of poster submissions on display last fall truly demonstrated the tenacity of our students. Each had the opportunity to present their research and conduct one-on-one discussions with key individuals in the field. This ideal approach benefits students as well as the companies for which our IAC members represent--students may secure future internship/careers and companies gain access to cutting-edge research being conducted by world-class researchers--and future employees!

2025 Industrial Advisory Committee Members:

Marcus Bianchi - National Renewable Energy Laboratory
Neil Herring - RTX Steve Sorenson - Toyota
Jason LeRoy - Trane Technologies
John Nalevanko - Ford Motor Company
Todd Rossi - Rutgers University
Paul Gloeckner - Cummins, Inc.
Jim McCarthy - Eaton
Ajay Iyengar - Lennox International, Inc.
Jon Douglas - Johnson Controls
Dan Conrad - Hussmann Corp.
Rudy Chervil
Doug Hansel - Allison Transmissions, Inc
Don Ufford - U.S. Department of Commerce
Brian Joyal - Veridiam
Danan Dou - John Deere
Mark Ehrlich - Wabash
David Frohberg - Caterpillar, Inc.
Kevin Mercer - Rheem
Paul Alexander - General Motors
Larry Burns - Carrier
Beat Stocker - Whirlpool
Michael Perevozchik - Copeland
Chad Bowers - Daikin
Steve Sorenson - Toyota

2026 HERRICK CONFERENCES



The 2026 Herrick Conferences, held July 12–16, 2026 at Purdue University, marked another milestone year for the premier gathering in compressor engineering, refrigeration and air conditioning, and high-performance buildings research. Operating in a hybrid format, the conference drew more than 660 attendees from around the world, including over 170 students — a strong signal of the event's continued relevance to both established researchers and the next generation entering the field. The scale of participation reflects the conference's standing within the HVAC&R community and its ongoing role as a meeting point for academia, industry, and applied research across the three co-located tracks.

The technical program was also extensive: five keynote and plenary talks framed the week's discussions, supported by 64 technical sessions that gave researchers a platform to present and debate current work. From 474 submitted abstracts, more than 340 papers were selected for presentation, underscoring both the competitiveness of the review process and the depth of research activity across compressor systems, refrigeration and air conditioning technology, and high-performance building design. Four social events rounded out the week, reinforcing the conference's dual function as both a technical forum and a space for building the professional relationships that sustain collaboration across conference cycles.

Beyond the research program, the 2026 conference placed a visible emphasis on supporting emerging talent: nine students were recognized with awards across the three conferences, valued at $1,000, $750, and $500. This investment in student recognition reflects a broader commitment to cultivating the next generation of researchers and practitioners in the field, and complements the strong student turnout among overall attendees. Taken together, the 2026 Herrick Conferences reaffirmed Purdue's role as a center of gravity for HVAC&R research and set a strong foundation for continued growth in future cycles.

The 2028 Herrick Conferences will take place July 10 - 13, 2028.

FY2026 CHPB MEMBERSHIPS & PROJECT FUNDING

During the academic year 2025/26, the CHPB continued to grow the membership, support educational activities, and pursue large scale federal funding opportunities.

2026 CHPB MEMBERS

16 COMPANY MEMBERS

13 PROJECTS

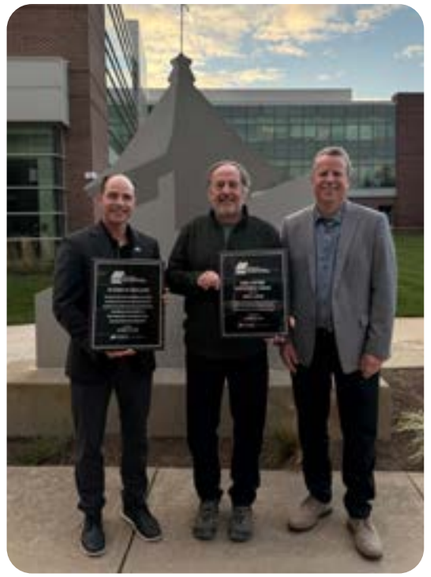
14 FACULTY PI/CO-PIs

25+ STUDENTS (G/UG)

CENTER FOR HIGH PERFORMANCE BUILDINGS

CENTER FOR HIGH PERFORMANCE BUILDINGS

During 2025/26, the Center continued to grow its membership, support educational activities, and pursue largescale federal funding opportunities.



ZIVIANI, BRAUN, GROLL

The 2025 CHPB Fall meeting marked the first historical 10th anniversary of the center, with the first meeting held in Fall 2015. This event marked an important milestone for CHPB and the Herrick community. In a decade of operation, CHPB recorded $7M+ in funding, 76 regular projects and 15 seed-funded projects with 25+ faculty PIs involved. More importantly, the Center engaged more than 100 undergraduate and graduate students as a testimony of the impact on education. In this occasion, CHPB founding director Jim Braun (now Professor Emeritus) recognized with the “CHPB Lifetime Achievement Award”. As of January 1, 2025, Dr. Ziviani and Dr. Groll are the Co-Directors of the center.

The 2025/26 CHPB membership increased to 16 members, with Bosch – Thermal Comfort and EATON joining the center. In 2025, the center funded 14 projects and in 2026 there are currently 13 projects ongoing.

CHPB-related projects yielded to major grants from different agencies including U.S. Department of Energy BTO/ITO, ARPA-E, the Water Research Foundation and the U.S. Department of Defense.

With respect to education, the CHPB has supported graduate students to travel to ASHRAE Winter and Annual Conferences as well as participation to the International Short Course on Refrigeration and Compressors (IRCC).

Learn more about the Center for High Performance Buildings by visiting their website: https://chpb.engineering.purdue.edu/

RESILIENT EXTRA-TERRESTRIAL HABITAT INSTITUTE

The Resilient ExtraTerrestrial Habitats Institute (RETHi), originally funded by NASA through an STRI grant, has now transitioned into a Purdue center focused on advancing design of safe, autonomous and resilient habitat systems. The centerpiece of the institute is the Human-Centered Autonomous Resilient Space Habitats (HARSH), a cyber-physical testbed developed at Purdue to study aspects of resilience, autonomy, situational awareness, decision-making, and systems health management for deep space habitats. By taking advantage of multi-physics real-time hybrid simulation (RTHS), HARSH enables reconfigurability for experimentation on autonomous decision-making under complex and confounding disruptions (unknown unknowns). This unique platform integrates a scaled physical habitat with real-time simulation and control instances, high-performance data acquisition, and realistic health management systems, creating a new paradigm for lower-cost, reconfigurable testing of cyber-physical systems.



The center builds on RETHi's legacy as a successful NASA research institute. Two Herrick faculty members serve in leadership roles: **Prof. Shirley Dyke, as the Center Director, and Prof. Ilias Bilionis, as the Awareness Team Leader.** Additional Herrick faculty and staff include **Davide Ziviani, Julio Ramirez, George Chiu, David Cappelleri, and Christian Silva.** Learn more on the institute's website: (https://www.purdue.edu/rethi/)

INTERNET OF THINGS 4 PRECISION AGRICULTURE

IoT4Ag is a U.S. National Science Foundation (NSF) Engineering Research Center established in 2020 with the mission to creating and translate IoT technologies for precision agriculture and training a workforce that will address the societal grand challenge of food, energy and water security for decades to come.

The Center combines expertise in areas including agronomy, agricultural engineering, economics, environmental science, and electrical, mechanical, computer materials and chemical engineering. Five universities participate in IoT4AG: Purdue University, University of Pennsylvania, University of California Merced, University of Florida, and Arizona State University.

HERRICK CENTER UPDATES

This year, Purdue University hosted the annual retreat, and welcomed researchers, students, industry leaders, and the grower community to Beck Agricultural Center and at regional farms in Indiana. Attendees shared research updates and deployed technologies for the upcoming growing season at Purdue's Agronomy Center for Research & Education (ACRE).

"We're looking at how technology can help agriculture produce more while using resources more efficiently," said David Cappelleri, professor of mechanical engineering, assistant vice president for research innovation at Purdue and the Purdue site director for IoT4Ag. "By integrating advanced tools and real-time data into farming practices, we can help address the growing global demand for food, energy and water in a more sustainable way."

Learn more about research at IoT4Ag by visiting the website: https://iot4ag.us/



David Cappelleri, assistant vice president for research innovation, professor of mechanical engineering and Purdue site director for IoT4Ag, addresses attendees during the 2026 Annual Retreat (Purdue University photo/Chad Krockover)

MAJOR RESEARCH FACILITIES



THE WILLIS CARRIER THERMAL SYSTEMS LABORATORIES

These areas are where the HVAC and Refrigeration component-level and system-level technology research is conducted, as well as research on Air Quality. Three pairs of psychrometric chambers: each 7,000 cubic feet, with 5-ton testing capacity and precise temperature and humidity control. Designed to accommodate ASHRAE/ARI test procedures. Sixteen geothermal bores: 300 feet deep, with variable flow rates and numerous temperature sensors. A 90-ton centrifugal chiller and ice storage test facility; computer-controlled compressor load stands; psychrometric wind tunnel with dust injection system. There are two indoor air quality (IAQ) laboratories that can simulate indoor and outdoor conditions. Instrumentation includes ultrasonic anemometers, omni-directional anemometers, tracer-gas sampler and analyzer, and particle generators and analyzers.

THE GERALD HINES SUSTAINABLE BUILDINGS TECHNOLOGY LABORATORY



Herrick Laboratories is a living laboratory where the built environment is being studied. It includes a 16 bore geothermal field and plug-and-play heat rejection for experiments in the engines and thermal sciences laboratories. Four, almost-identical 34′ x 37′ office spaces for human-building interaction and building technology studies; completely customizable temperature, humidity, airflow patterns, and acoustic treatments; reconfigurable indoor lighting, daylighting/shading controls, mechanical cooling and ventilation controls, and more; thermal delivery by ceiling, floor or side walls, including radiant-floor heating and radiant-chilled beam cooling; replaceable south-facing building envelopes. The normal temperature range is 65° F to 75° F but this can be extended to 55° F to 85° F. Relative humidity can be varied from 20% to 80%. Three of the units have double skin facades with different options for ventilation and energy recovery. All of the offices spaces have separate equipment for providing space conditioning that are well instrumented to allow direct energy comparisons.

MAJOR RESEARCH FACILITIES



THE CUMMINS POWER LABORATORY

There are four test cells that are home to engine and hybrid systems controls research that is focused on improving efficiency, reducing engine emissions and developing efficient and environmentally friendly systems for using alternative fuels. The four test cells support 670, 350, 150 and 150 HP engine testing, respectively. A hydraulic variable valve actuation system capable of controlling 12 valves, a single cylinder rig for testing piezoelectric valve actuation, and an AC dynamometer and several eddy-current engine dynamometers, as well as emissions sensing systems.

ROGER B. GATEWOOD HIGH-BAY FLEXIBLE LABORATORY & SMALL-SCALE VIBRATIONS LABORATORY



These spaces house electro-mechanical systems, additive manufacturing, and vibrations research. This is comprised of two parts: an open 36 by 87 ft. high-bay area with segmented floors for vibration isolation between experiments, and a smaller laboratory for smaller scale experiments. The high-bay area has high ceilings to accommodate large systems for testing. It can house large shakers, such as a 35 kN TIRA electrodynamic shaker that can be used to reproduce vibration profiles and has in-built hydraulic power supplies for hydraulic shakers. In this area, the vibration and dynamics of larger structures can be examined such as building components, vehicle suspension systems, wind turbine blades, road vehicle and aircraft and space structures. The 700 sq. ft. small-scale laboratory includes apparatus for the dynamic testing of materials and small structures to investigate nonlinear dynamic behavior and to identify structural and material parameters.

MAJOR RESEARCH FACILITIES



ACOUSTICS, NOISE AND VIBRATION RESEARCH AREA

In addition to the facilities in the High-Bay Flexible Laboratory and Perception-Based Engineering areas, these facilities include a 25 by 20 by 18 ft. reverberation room, an anechoic room with useful volume of 12 by 12 by 12 ft., a hemi anechoic room with useful volume of 41 by 27 by 18 ft. and an 8 by 8 ft. audiometric room for sound quality testing. The acoustical materials laboratory has several types of impedance tubes for standardized acoustic material testing. The reverberation room is configured for sound transmission testing of acoustical systems. Additional facilities include a tire pavement test apparatus (TPTA) for testing tires on realistic pavements at speeds up to 50 km/hr, a two wheel chassis dynamometer with 67 inch rollers, an anechoic wind tunnel with 18 by 24 inch test section and flow velocity up 120 mph. Instrumentation includes a 64 microphone acoustical holography array and 90 channel data acquisition system, various microphones, accelerometers, shakers, laser vibrometers, and a high-speed camera.

FORD PERCEPTION-BASED ENGINEERING LABORATORY



Perception-Based Engineering (PBE) researchers study people's perceptions of stimuli, their influence on satisfaction, comfort, annoyance and performance -- and the relationship between those outcomes and the system, design, and operational parameters. PBE faculty at Purdue work on projects related to lighting, touch interfaces, sound and vibration quality, image quality and depth perception, display design and graphics optimization, effects of noise on performance, thermal comfort, and human-computer interaction.

2026 HERRICK FACULTY



ANDRES ARRIETA

DOUG AND CATHY FIELD RISING STAR PROFESSOR OF MECHANICAL ENGINEERING
PH.D., UNIVERSITY OF BRISTOL, UNITED KINGDOM, '10

RESEARCH INTERESTS:
Adaptive structures ▪ Mechanical metamaterials ▪ Soft Robotics ▪ Programmable structures ▪ Multistable structures ▪ Structural nonlinearity ▪ Elastic instabilities ▪ Structural dynamics ▪ Nonlinear vibrations



ANIL K. BAJAJ

ALPHA P. JAMISON PROFESSOR OF MECHANICAL ENGINEERING
PH.D., UNIVERSITY OF MINNESOTA, '81

RESEARCH INTERESTS:
Modeling of nonlinear systems ▪ Structural dynamics and localization ▪ Flow-induced vibrations ▪ Impacting systems ▪ Bifurcations and chaos



RILEY BARTA

ASSISTANT PROFESSOR OF MECHANICAL ENGINEERING
B.S., PURDUE UNIVERSITY, '16, PH.D., PURDUE UNIVERSITY, '20

RESEARCH INTERESTS:
Modeling and Analysis of Thermal Systems ▪ Heat Pumping, Air Conditioning and Refrigeration Technologies ▪ High Performance Buildings ▪ Refrigerant and Lubricant Properties



ILIAS BILIONIS

PROFESSOR OF MECHANICAL ENGINEERING
PH.D., CORNELL UNIVERSITY, '13

RESEARCH INTERESTS:
Uncertainty propagation ▪ Inverse problems ▪ Propagation of information across scales ▪ Optimal learning ▪ Materials by design

2026 HERRICK FACULTY



ERNEST BLATCHLEY

LEE A. RIETH PROFESSOR IN ENVIRONMENTAL ENGINEERING
B.S., PURDUE UNIVERSITY '81, M.S., UNIVERSITY OF CALIFORNIA, BERKELEY '83, PH.D., UNIVERSITY OF CALIFORNIA, BERKELEY '88

RESEARCH INTERESTS:
Design and analysis of ultraviolet (UV) systems for disinfection of indoor air; methods to quantify and validate the performance of UV disinfection systems for indoor air.



J. STUART BOLTON

PROFESSOR EMERITUS OF MECHANICAL ENGINEERING
PH.D. SOUTHAMPTON, '84

RESEARCH INTERESTS:
Acoustics ▪ Active and passive noise control ▪ Sound field visualization ▪ Structural acoustics and wave propagation in structures ▪ Noise control material modeling ▪ Applied signal processing



BRANDON E BOOR

DR. MARGERY E. HOFFMAN ASSOCIATE PROFESSOR IN CIVIL ENGINEERING
PH.D., THE UNIVERSITY OF TEXAS AT AUSTIN, '15

RESEARCH INTERESTS:
Indoor air quality (IAQ) ▪ HVAC filtration ▪ Human exposure assessment ▪ Airborne nanoparticles ▪ Bioaerosols (fungi, bacteria, pollen, allergens) ▪ Air quality in occupational workplaces ▪ Particle adhesion & resuspension ▪ Early-life/infant exposures ▪ Combustion aerosols & wood smoke ▪ New particle formation ▪ Urban air pollution ▪ Low-cost air quality monitoring ▪ Health effects of air pollution ▪ Fate & transport of VOCs/SVOCs.



JAMES E. BRAUN

PROFESSOR EMERITUS OF MECHANICAL ENGINEERING
PH.D., UNIVERSITY OF WISCONSIN, '88

RESEARCH INTERESTS:
Modeling, analysis, and control of thermal systems

2026 HERRICK FACULTY



JIE CAI

ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING
PH.D., PURDUE UNIVERSITY, '15

RESEARCH INTERESTS:
Grid-Interactive Building Controls ▪ Modeling and Control of Thermal/Energy Systems ▪ HVAC and Smart Buildings ▪ Data-Driven Modeling ▪ Intelligent Control Systems



DAVID J. CAPPELLERI

ASSISTANT VP FOR RESEARCH INNOVATION, PROFESSOR OF MECHANICAL ENGINEERING, PH.D., UNIVERSITY OF PENNSYLVANIA, '08

RESEARCH INTERESTS:
Multi-scale robotic manipulation and assembly, mobile microrobotics, unmanned aerial and ground vehicle design and control, agricultural robotics, mobile manipulation, medical robotics, and automation for the life sciences



JUN CHEN

ASSOCIATE HEAD FOR FACILITIES AND OPERATIONS,
PROFESSOR OF MECHANICAL ENGINEERING
PH.D., JOHNS HOPKINS UNIVERSITY, '04

RESEARCH INTERESTS:
Experimental fluid dynamics ▪ Development of flow diagnostic techniques ▪ Flow dynamics in stratified environment ▪ Turbulent flow measurements and modeling



GEORGE T. C. CHIU

PROFESSOR OF MECHANICAL ENGINEERING,
COURTESY APPOINTENTS IN ELECTRICAL AND COMPUTER ENGINEERING AND PSYCHOLOGICAL SCIENCES
PH.D., UNIVERSITY OF CALIFORNIA-BERKELEY, '94

RESEARCH INTERESTS:
Dynamic systems and control ▪ Mechatronics ▪ Digital and functional printing and fabrication
▪ Motion and vibration control and perception ▪ Embedded systems and real-time control

2026 HERRICK FACULTY



REBECCA CIEZ

ASSISTANT PROFESSOR OF MECHANICAL ENGINEERING, AND ENVIRONMENTAL AND ECOLOGICAL ENGINEERING
PH.D., CARNEGIE MELLON UNIVERSITY, '18

RESEARCH INTERESTS:
Energy technologies ▪ Economics ▪ Decision-making processes ▪ Decarbonized energy systems



PATRICIA DAVIES

PROFESSOR EMERITA OF MECHANICAL ENGINEERING
PH.D., SOUTHAMPTON, '85

RESEARCH INTERESTS:
Sound quality ▪ Signal processing ▪ Data analysis ▪ System modeling and identification ▪ Condition monitoring of machinery ▪ Perception-based engineering ▪ Seat-occupant modeling



BRADLEY DUERSTOCK

PROFESSOR OF ENGINEERING PRACTICE BIOMEDICAL ENGINEERING
PH.D., PURDUE UNIVERSITY, '99

RESEARCH INTERESTS:
Neurotrauma ▪ Assistive Technology / Rehabilitation Engineering ▪ Noninvasive Physiological Sensing / Wearable Devices ▪ Accessible Design



SHIRLEY J. DYKE

DONALD A. AND PATRICIA A. COATES PROFESSOR OF INNOVATION IN MECHANICAL ENGINEERING AND CIVIL ENGINEERING
PH.D., UNIVERSITY OF NOTRE DAME, '96

RESEARCH INTERESTS:
Structural dynamics and control ▪ Cyber-physical systems ▪ Machine vision ▪ Real-time hybrid simulation ▪ Damage detection and structural condition monitoring ▪ Cyberinfrastructure development

2026 HERRICK FACULTY



JOHN T. EVANS IV

ASSISTANT PROFESSOR OF AGRICULTURAL AND BIOLOGICAL ENGINEERING, COURTESY APPOINTMENT IN MECHANICAL ENGINEERING
B.S., UNIVERSITY OF KENTUCKY , '13 , M.S., UNIVERSITY OF KENTUCKY , '15 , PH.D., UNIVERSITY OF NEBRASKA, '18

RESEARCH INTERESTS:
Automation and Autonomy ▪ Machine Logistics ▪ Cropping Systems Technologies ▪ Vehicle Simulation and Testing



JAMES GIBERT

ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING
PH.D., CLEMSON UNIVERSITY, '09

RESEARCH INTERESTS:
Vibrations and nonlinear dynamics ▪ Smart material systems ▪ Non-pneumatic tires ▪ Optimization of mechanical systems ▪ Additive manufacturing



CHRISTOPHER GOLDENSTEIN

AVRUM AND JOYCE GRAY RISING STAR PROFESSOR IN ENTREPRENEURSHIP AND INNOVATION
PH.D., STANFORD UNIVERSITY, '14

RESEARCH INTERESTS:
Laser-absorption spectroscopy, laser-induced fluorescence, & IR imaging sensors for gas temperature, pressure, velocity, and chemical species ▪ Molecular spectroscopy, photophysics, & energy transfer in gases ▪ Energetic materials (e.g., explosives & propellants) detection & combustion ▪ Combustion and propulsion systems (small and large scale) ▪ Biomedical sensing



MARCIAL GONZALEZ

ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING
PH.D., CALIFORNIA INSTITUTE OF TECHNOLOGY, '11

RESEARCH INTERESTS:
Predictive, multi-scale modeling and simulation of microstructure evolution in confined granular systems, with an emphasis in manufacturing processes and the relationship between product fabrication and performance ▪ Particulate products and processes ▪ Continuous manufacturing ▪ Performance of pharmaceutical solid products

2026 HERRICK FACULTY



ECKHARD A. GROLL

WILLIAM E. AND FLORENCE E. PERRY HEAD OF MECHANICAL ENGINEERING
REILLY PROFESSOR OF MECHANICAL ENGINEERING
"DOKTOR-INGENIEUR" (DOCTOR OF ENGINEERING), UNIVERSITY OF HANNOVER, '94

RESEARCH INTERESTS:
Thermal sciences as applied to HVAC&R systems and equipment



SOGAND MOHAMMAD HASANZADEH

ASSISTANT PROFESSOR OF CIVIL ENGINEERING
PH.D., VIRGINIA TECH, '20

RESEARCH INTERESTS:
Digital Twins ▪ Thermal Stress and Human Factors▪ Wearable Technologies ▪ Human-Robot Teaming ▪ Smart Safety and Advanced Sensing



ERIC HOLLOWAY

PROFESSOR OF ENGINEERING PRACTICE, COURTESY FACULTY OF ENGINEERING EDUCATION
PH.D., PURDUE UNIVERSITY, '20

RESEARCH INTERESTS:
Engine testbed and facilities, and students' professional development



W. TRAVIS HORTON

PROFESSOR OF CIVIL ENGINEERING
PH.D., PURDUE UNIVERSITY, '02

RESEARCH INTERESTS:
Advanced thermal energy conversion systems ▪ Energy utilization in buildings, and the interactions between a building and its environment ▪ Development of advanced, highly integrated, heating, ventilating, air conditioning, and refrigeration systems

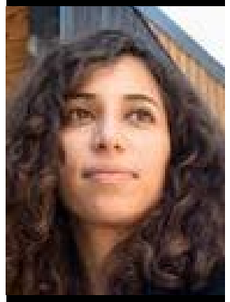
2026 HERRICK FACULTY



NEERA JAIN

ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING
PH.D., UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, '13

RESEARCH INTERESTS:
Dynamic modeling and optimal control ▪ Model predictive control ▪ Decentralized control ▪ Thermodynamics-based optimization ▪ Entropy generation minimization ▪ Energy analysis ▪ Integrated energy management and storage in distributed energy systems ▪ Building systems



NUSRAT JUNG

ASSISTANT PROFESSOR OF CIVIL AND CONSTRUCTION ENGINEERING
D.Sc. AALTO UNIVERSITY, ESPOO, FINLAND, '18

RESEARCH INTERESTS:
Architectural engineering ▪ Environmental sensing of the built environment ▪ Indoor air quality



PANAGIOTA KARAVA

JACK AND KAY HOCKEMA PROFESSOR OF CIVIL AND CONSTRUCTION ENGINEERING
PH.D., CONCORDIA UNIVERSITY, '08

RESEARCH INTERESTS:
Smart buildings, intelligent building operation, system identification, model predictive control
▪ Human-building interactions, personalized control, self-tuned environments ▪ Smart and connected energy-aware residential communities ▪ Energy efficient and mixed-mode buildings, innovative energy and comfort delivery systems ▪ Solar technology integration in building operation



KEVIN KIRCHER

ASSISTANT PROFESSOR OF MECHANICAL ENGINEERING
PH.D., CORNELL UNIVERSITY, '19

RESEARCH INTERESTS:
Control, optimization, and machine learning methods for energy systems in buildings, focusing on their interactions with the power grid ▪ New technologies for efficient electric heating ▪ Validation methods through field experiments ▪ Collaboration with campus building operators.

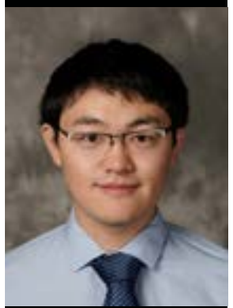
2026 HERRICK FACULTY



CHARLES M. KROUSGRILL

TEBBE FAMILY 150TH ANNIVERSARY PROFESSOR OF MECHANICAL ENGINEERING
PH.D., CALIFORNIA INSTITUTE OF TECHNOLOGY, '80

RESEARCH INTERESTS:
Dynamics ▪ Nonlinear vibration of continuous systems ▪ Stability analysis



JUNFEI LI

ASSISTANT PROFESSOR OF MECHANICAL ENGINEERING

RESEARCH INTERESTS:
Acoustic tweezers ▪ Acoustofluidics ▪ Ultrasound imaging ▪ Acoustic metamaterials ▪ Noise control



TIAN LI

ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING
PH.D. UNIVERSITY OF MARYLAND, '15

RESEARCH INTERESTS:
Naturally nanostructured materials ▪ Energy, water, and wearable technology ▪ Manufacturing



YANGFAN LIU

ASSISTANT PROFESSOR OF MECHANICAL ENGINEERING
PH.D., PURDUE UNIVERSITY, '16

RESEARCH INTERESTS:
Acoustic Source Modeling and sound field reconstruction ▪ Active noise control ▪ Room acoustics simulation and auralization ▪ Noise control treatments ▪ Human perception of noise

2026 HERRICK FACULTY



PETER H. MECKL

PROFESSOR EMERITUS OF MECHANICAL ENGINEERING
PH.D., MASSACHUSETTS INSTITUTE OF TECHNOLOGY, '88

RESEARCH INTERESTS:
Motion and vibration control ▪ Adaptive control ▪ Intelligent control using fuzzy logic and neural networks ▪ Engine and emissions diagnostics ▪ Robotics



BRANDON PITTS

ELLIOTT SIGEL RISING STAR ASSOCIATE PROFESSOR OF INDUSTRIAL ENGINEERING
PH.D., UNIVERSITY OF MICHIGAN, '16

RESEARCH INTERESTS:
Cognitive ergonomics ▪ Human-automation interaction ▪ Multimodal / multisensory information processing ▪ Adaptive displays ▪ Aging and technology



MING QU

PROFESSOR OF CIVIL ENGINEERING
PH.D., CARNEGIE MELLON UNIVERSITY, '08

RESEARCH INTERESTS:
Solar cooling and heating systems ▪ Building heat transfer ▪ Building energy supply systems ▪ Building controls and operations ▪ Building and building system modeling & simulation ▪ Sustainable building design and analysis ▪ Building system integration dedicated to sustainable and healthy built environments



JULIO A RAMIREZ

KARL H. KETTELHUT PROFESSOR OF CIVIL ENGINEERING
NHERI-NCO CENTER DIRECTOR
PH.D., UNIVERSITY OF TEXAS AT AUSTIN, '83

RESEARCH INTERESTS:
Structural analysis and design of reinforced and prestressed concrete structures, with emphasis on seismic performance of concrete buildings and infrastructure ▪ Structural models and experimental methods ▪ Design codes for structural concrete

2026 HERRICK FACULTY



FABIO SEMPERLOTTI

PROFESSOR OF MECHANICAL ENGINEERING
PH.D., THE PENNSYLVANIA STATE UNIVERSITY, '09

RESEARCH INTERESTS:
Structural health monitoring ▪ Wave propagation ▪ Structural dynamics and vibration control ▪ Adaptive structures ▪ Periodic structures and acoustic metamaterials ▪ Energy harvesting ▪ Thermoacoustics



GREGORY M. SHAVER

REILLY PROFESSOR OF MECHANICAL ENGINEERING
DIRECTOR OF HERRICK LABS, DIRECTOR OF THE SMART CROSSROADS CONSORTIUM
PH.D., STANFORD UNIVERSITY, '05

RESEARCH INTERESTS:
Model-based system and control design of commercial vehicle power trains ▪ Connected and automated commercial vehicles ▪ Internal combustion engine & after-treatment system design and controls ▪ Flexible valve actuation in diesel and natural gas engines



SHREYAS SUNDARAM

MARIE GORDON PROFESSOR, ELMORE FAMILY SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING AND CO-DIRECTOR, INSTITUTE FOR CONTROL, OPTIMIZATION AND NETWORKS
PH.D., UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, '09

RESEARCH INTERESTS:
Network science ▪ control ▪ communications ▪ distributed algorithms



ATHANASIOS (THANOS) TZEMPELIKOS

PROFESSOR OF CIVIL AND CONSTRUCTION ENGINEERING
PH.D., CONCORDIA UNIVERSITY, '05

RESEARCH INTERESTS:
Design, operation and optimization of high performance buildings ▪ Daylighting, design and control of dynamic facade and shading systems ▪ Indoor environmental (thermal and visual) quality and comfort ▪ Occupant preferences and interaction with building systems ▪ Radiant building systems ▪ Solar energy applications in buildings ▪ Building energy modeling and simulation

2026 HERRICK FACULTY



DAVID WARSINGER

ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING
PH.D., MASSACHUSETTS INSTITUTE OF TECHNOLOGY

RESEARCH INTERESTS:
Desalination & Water Treatment ▪ Water-Food-Energy Nexus ▪ Thermofluids Nanotechnology Membrane Science



DANIEL WILLIAMS

PROFESSOR OF ENGINEERING PRACTICE
PH.D., FLORIDA INSTITUTE OF TECHNOLOGY, '95

RESEARCH INTERESTS:
Vehicle Chassis Control Systems Vehicle Dynamics Autonomous Vehicles Human Driver Dynamics



DAVIDE ZIVIANI

ASSOCIATE PROFESSOR OF MECHANICAL ENGINEERING
ASSOCIATE DIRECTOR OF THE CENTER FOR HIGH PERFORMANCE BUILDINGS
PH.D., GHENT UNIVERSITY (BELGIUM), '17

RESEARCH INTERESTS:
Advanced heat pumping/heat engine technologies and their equipment ▪ Positive displacement compressors and expanders ▪ High performance buildings ▪ Thermal management systems

2026 HERRICK STAFF



C. KYLE BAER
LABORATORY OPERATIONS MGR.



JOSHUA BUDREAU
LABORATORY OPERATIONS SPEC.



KIMBERLY DALY
MKTG. & COMM. SPEC.



VICKY DEARDURFF
CUSTODIAL SERVICES



HEMANTH DEVARAPALLI
CHPB SR. RESEARCH SUPPORT ANALYST



LEA GREATHOUSE
MANAGING DIRECTOR



JOSE LOPEZ ROMERO
LABORATORY OPERATIONS SPEC.



JORDAN NECHKASH
LABORATORY OPERATIONS SPEC.



VIVIAN SCOTT
SR. ADMINISTRATIVE ASSISTANT



CHRISTIAN SILVA
RESEARCH SCIENTIST

2026 HERRICK POST DOC RESEARCH ASSOCIATES



JUNAID ALI



AJJAWAL ARYA



JONATHAN BOYACK



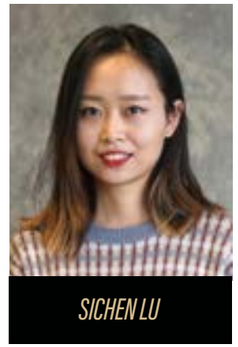
JUAN CAMILO OSORIO PINZON



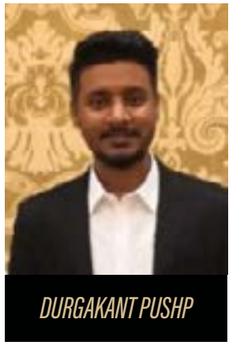
QILONG CHENG



ANTONIO ESQUIVEL PUENTES



SICHEN LU



DURGAKANT PUSHP



HONGCHENG TAO



YANPEI TIAN

WINTER 2025 HERRICK GRADUATES



JUNAID ALI

DEGREE: Ph.D. **PROFESSOR:** GREGORY SHAVER

THESIS: DYNAMIC ANALYSIS AND MITIGATION OF TORSIONAL OSCILATIONS IN ROTATING SYSTEMS



STEPHANIE ANDRESS

DEGREE: M.S. **PROFESSOR:** JAMES GIBERT

THESIS: PROCESSING AND MECHANICAL PERFORMANCE OF HIGH-SOLIDS POLYMER-PARTICLE COMPOSITES: A COMBINED EXPERIMENTAL AND COMPUTATIONAL APPROACH



BIJAY CHHETRI

DEGREE: M.S. **PROFESSOR:** ECKHARD GROLL

NON-THESIS



JOSHUA COX

DEGREE: M.S. **PROFESSOR:** RILEY BARTA

THESIS: MEASUREMENT OF ZEOTROPIC REFRIGERANT FRACTIONATION WITH LUBRICANTS DURING PHASE CHANGE



LOGAN HUBERT

DEGREE: M.S. **PROFESSOR:** DAN WILLIAMS

THESIS: LONGITUDINAL CONTROL OF AUTONOMOUS RACECAR FOR THE INDY AUTONOMOUS CHALLENGE



JACOB HUNTER

DEGREE: Ph.D. **PROFESSOR:** NEERA JAIN

THESIS: OBJECTIVE DESIGN FIXATION ANALYSIS AS A BASIS FOR AI-DESIGNER TEAMING IN CONSTRAINED DESIGN



SICHEN LU

DEGREE: Ph.D. **PROFESSOR:** THANOS TZEMPELIKOS

THESIS: MULTI-DIMENSIONAL STUDIES FOR ADVANCING HUMAN-CENTERED AND ENERGY-EFFICIENT DAYLIGHTING DESIGN AND OPERATION



STEVEN MONTOYA GRAJALES

DEGREE: M.S. **PROFESSOR:** ECKHARD GROLL

THESIS: NUMERICAL AND EXPERIMENTAL INVESTIGATIONS OF A NOVEL EJECTOR-REGENERATIVE CO^2 REFRIGERATION CYCLE ARCHITECTURE



SNEHA SRIKANTH

DEGREE: MS. **PROFESSOR:** ANDRES ARRIETA

NON-THESIS

SPRING 2026 HERRICK GRADUATES



SREETAM BHADURI

DEGREE: Ph.D. **PROFESSOR:** ECKHARD GROLL / DAVIDE ZIVIANI

THESIS: HIGH-FIDELITY SIMULATION AND SELF-SIMILAR PROPERTIES OF MULTIPHASE TURBULENT JETS IN CARBON-DIOXIDE EJECTORS FOR HVAC&R APPLICATIONS



JOSEPH BRONISZEWSKI

DEGREE: M.S. **PROFESSOR:** NEERA JAIN

THESIS: OPTIMAL SENSING AND SOC ESTIMATION FOR LATENT THERMAL ENERGY STORAGE IN HEAT PUMP SYSTEMS.



SESHA CHARLA

DEGREE: Ph.D. **PROFESSOR:** PETER MECKL

THESIS: ON-BOARD DIAGNOSTICS FOR DIESEL ENGINE AFTERTREATMENT SYSTEMS: MODELING, SYSTEM IDENTIFICATION, AND CATALYST AGING DETECTION



HYEJIN CHO

DEGREE: Ph.D. **PROFESSOR:** DAVID WARSINGER

THESIS: ENERGY PERFORMANCE EVALUATION OF HOLLOW FIBER MEMBRANE-BASED LATENT HEAT EXCHANGER FOR VENTILATION



YIDAN CUI

DEGREE: Ph.D. **PROFESSOR:** YANGFAN LIU / DAVIDE ZIVIANI

THESIS: NUMERICAL MODELING OF COUPLED FLUID, ACOUSTICS AND STRUCTURAL INTERACTION PHENOMENA IN HERMETIC COMPRESSORS



PENGFEI DENG

DEGREE: Ph.D. **PROFESSOR:** TIAN LI

THESIS: BIO-INTEGRATED INTERFACES FOR HUMAN-MACHINE INTERACTION: SENSING, ACTUATION, AND COMPUTING



XIN DING

DEGREE: Ph.D. **PROFESSOR:** ECKHARD GROLL / DAVIDE ZIVIANI

THESIS: A GEOMETRY-AWARE AND MACHINE LEARNING-ASSISTED DESIGN FRAMEWORK FOR VARIABLE WALL-THICKNESS SCROLL COMPRESSORS IN ELECTRIFIED HEAT-PUMP APPLICATIONS

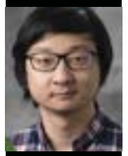
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AARON HARTZELL

DEGREE: M.S. **PROFESSOR:** RILEY BARTA / DAVIDE ZIVIANI

THESIS: NUMERICAL AND EXPERIMENTAL INVESTIGATION OF A NOVEL R-744 ROTARY COMPRESSOR FOR ELECTRIC VEHICLE APPLICATIONS



DAZHUANG HE

DEGREE: Ph.D. **PROFESSOR:** YANGFAN LIU

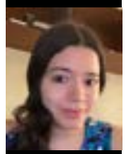
THESIS: VIBROACOUSTIC ANALYSIS OF POSITIVE DISPLACEMENT FLUID MACHINERY BASED ON MULTIPHYSICS SIMULATIONS



CHUNXU HUANG

DEGREE: M.S. **PROFESSOR:** BRANDON BOOR

THESIS: ADVANCING REALISTIC ASSESSMENT OF HVAC PARTICULATE FILTER: TEMPORAL EVOLUTION IN FILTRATION AGING PERFORMANCE, METHOD FOR RAPID AGING, AND IMPACT ON OCCUPANCY RESPIRATORY EXPOSURE & CARCINOGENIC RISK



LISSETTE ITURBURU

DEGREE: Ph.D. **PROFESSOR:** SHIRLEY DYKE

THESIS: ARTIFICIAL INTELLIGENCE FOR REINFORCED CONCRETE BUILDING INFORMATION EXTRACTION AND RISK-INFORMED RETROFIT DECISION-MAKING



BRYANT JEPSEN

DEGREE: M.S. **PROFESSOR:** DAVIDE ZIVIANI

THESIS: A GEOMETRIC EXTERNAL THERMAL LOAD CALCULATION FRAMEWORK FOR EXTRATERRESTRIAL HABITAT DESIGN



LIAM JOHNSON

DEGREE: M.S. **PROFESSOR:** KEVIN KIRCHER

THESIS: PREDICTIVE CONTROL OF A RESIDENTIAL GEOTHERMAL NETWORK WITH THERMAL ENERGY STORAGE



KITAE KIM

DEGREE: Ph.D. **PROFESSOR:** DAVE CAPPELLERI

THESIS: "IN-ROW AND UNDER-CANOPY AUTONOMOUS NAVIGATION SYSTEM FOR AGRICULTURAL MOBILE ROBOTS IN CORNFIELDS

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CLARK LAY

DEGREE: M.S. **PROFESSOR:** DAVID WARSINGER

THESIS: A TECHNO-ECONOMIC ANALYSIS OF VAPOR SELECTIVE MEMBRANE DEHUMIDIFICATION PROCESSES



ALEX LEE

DEGREE: Ph.D. **PROFESSOR:** KEVIN KIRCHER

THESIS: DATA-DRIVEN ESTIMATION OF DESIGN HEATING LOADS FOR HVAC EQUIPMENT SIZING



DAN LITOWITZ

DEGREE: M.S. **PROFESSOR:** GREGORY SHAVER

THESIS: ENERGY HARVESTING POTENTIAL OF A LOADED SEMI-TRUCK TRAILER



REYNOLDS MANION

DEGREE: Ph.D. **PROFESSOR:** GREGORY SHAVER

THESIS: MODEL-BASED MULTIVARIABLE AIR-PATH CONTROL AND FAULT-TOLERANT OPERATION FOR RELIABLE, LOW-EMISSION ENGINE PERFORMANCE



SEYED KIARASH MOSSALAEI

DEGREE: M.S. **PROFESSOR:** JAMES BRAUN / W. TRAVIS HORTON

THESIS: IMPROVED METHODS FOR EVALUATING SEASONAL ENERGY EFFICIENCIES OF RESIDENTIAL HEAT PUMP SYSTEMS USING LOAD-BASED TESTING



YASH MATHUR

DEGREE: M.S. **PROFESSOR:** NEERA JAIN

THESIS: INTEGRATED CABIN HVAC AND BATTERY THERMAL MANAGEMENT USING NONLINEAR MODEL PREDICTIVE CONTROL



PANAGIOTIS PAPAGEORGIOU

DEGREE: Ph.D. **PROFESSOR:** KEVIN KIRCHER

NO THESIS


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