

Herrick Newsletter



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2017 Industrial Advisory Committee Meeting October 26 - 27



2017 IAC Members and Guests

Upcoming Events:

- July 8, 2018** Short Courses
- July 9-12, 2018** Compressor, Refrigeration & Building Conferences



Herrick Laboratories Building, 1912**
From the J.C. Allen Collection, courtesy of
Purdue University Libraries, Archives & Special
Collections



New Ray W. Herrick Laboratories Building,
opened November 2013

The 65th Annual Industrial Advisory Committee (IAC) meeting was held at the Laboratories Thursday, October 26 - Friday, October 27. After the welcome and introductions by Chairman, Terry Manon, Patricia Davies gave the State-of-the-Laboratories Report, which was well-received by the members. Patricia and the faculty were commended for their effort on the continued growth of the lab projects and resources. The Strategic Planning Committee members in attendance: Patricia Davies, Jeff Rhoads, Neera Jain, and Dave Cappelleri gave an update on the progress of the five strategic plan goals. The IAC members made a few suggestions regarding the goals, which the faculty will implement.

Anil Bajaj, the William E. and Florence E. Perry Head of Mechanical Engineering, followed with an update on the School of Mechanical Engineering.

Friday afternoon was the Student Poster show with 86 posters being presented. The IAC commented that the overall quality and content of both the posters and the presentations were

the best that they've seen. They were impressed with the diversity of projects and the evidence of the students' collaboration and understanding of each other's projects.

After the poster show and wonderful lunch, the new Dean of Engineering, Mung Chiang met with the Committee and faculty members. He gave a presentation on the vision for Purdue Engineering. Everyone was encouraged by the Dean's evident proactive leadership style, his strong support of Herrick Laboratories collaboration with industry and the importance of ongoing industry advisory input to the School of Engineering, and his encouragement of entrepreneurship.

In the afternoon, three breakout sessions were held on the following topics: (1) Student Seminar/Worshop Series, led by IAC members Brian Joyal and Bob Parrin, Prof. Neera Jain, and student Daniel McArthur; (2) Poster Show Format and IAC-Student Interactions for the 2018 IAC, led by IAC member John Galbraith, Prof.

2017 Industrial Advisory Committee (continued)

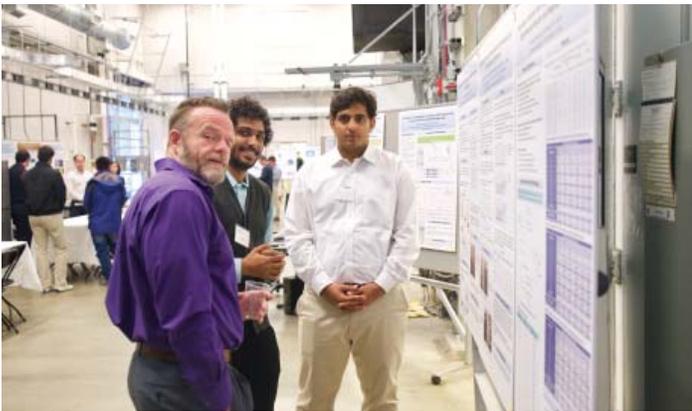
James Gibert, and student Domenique Lumpkin; and (3) Addressing Future Space Issues, led by IAC member Steve Sorenson and Prof. Stuart Bolton. Breakout session #2 will continue to explore alternatives to the current Poster Show in an effort to better accomplish the show's identified objectives.

Saturday morning, Patricia Davies and Stuart Bolton hosted a brunch at their home for those who were still in town to attend the 7:30 pm football game.

Overall, it was another successful IAC meeting with lots of useful suggestions and great comments. Here are several pictures taken throughout the IAC meeting and Student Poster Show. Thanks to our student Shenwei Wang for being our photographer.



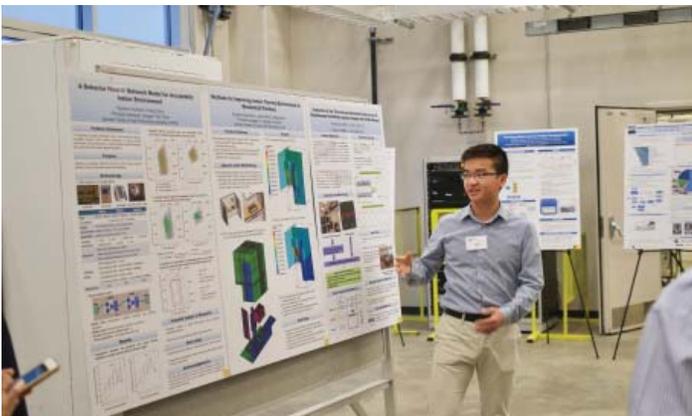
John Hollkamp presented his research project which developed a model order reduction technique capable of maintaining dynamic behavior of active degrees of freedom across a wide frequency spectrum by utilizing the mathematics of fractional calculus.



IAC member (and former Herrick student!) Jason LeRoy conversing with students Akash Patil and Parveen Dhillon during the poster show.



Nikhil Bajaj discusses dynamics and vibrations research related to MEMS sensors for the detection of trace energetic material.



Zhu Shi discusses research on a coupled system that combines displacement ventilation system and passive chilled beams in a room. Measurements are being conducted in the Labs' IAQ chamber. Further analysis will be performed to look into indoor air quality and thermal comfort under such a coupled system, and to establish its design guidelines.



Tony Xue presents his research on advanced modeling of acoustical or damping materials and structures by analytical or numerical methods. The objectives are to predict the noise or vibration control performance of different layered treatments, and to realize the structural design and optimization of the lightweight sound absorbing materials.

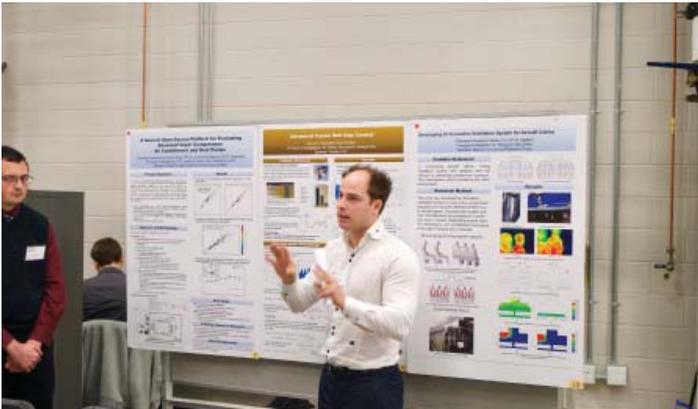
2017 Industrial Advisory Committee - (continued)



Dean of Engineering Mung Chiang (above) addressed the IAC Committee members, guests, and faculty during Friday's meeting.



A few students enjoying conversation with one of the IAC members over a delicious meal.



Davide Ziviani discusses three numerical approaches to optimize different systems: (1) a generalized framework for advanced vapor compression systems named AVCSim; (2) an Iterative Learning Control Algorithm (ILC) utilized to reduce periodic disturbances during a twin-roll casting process; (3) computational fluid-dynamics employed to analyze the air quality inside an aircraft cabin.



Nelson James (above, right) talks about his research on the investigation of novel thermal systems to increase the efficiency of heat pumping devices. His dissertation focuses on the modeling and design of an electrochemically driven chemical looping heat pump. If successful this technology has the potential to reduce energy consumption by 20% in comparison to traditional heat pumping cycles.



IAC Members, Guests, Faculty, Staff, and Students - IAC 2017

Alumni Reflections - Ed Eisele, MSME 1965, Ph.D. 1969



Ed Eisele - 1965

In the Spring of 1963 I graduated from Lafayette College in Easton, PA with a BS degree in Mechanical Engineering. Earlier in the Spring I had decided to pursue a masters degree and had selected the Herrick Labs at Purdue. I liked the people, the courses available and the fact that the labs did work for industry with practical applications. I had a research assistantship to measure the viscosity of liquid refrigerants from -200 degrees F to +200 degrees F. The corporate sponsor was Dupont. My co-

major professors were Wolf Leidenfrost and Bill Fontaine. Even though a piece of experimental equipment existed, Dr. Leidenfrost wanted to build a simpler device using pool boiling refrigerants as the temperature bath. He convinced Bill and the sponsor that this was a good direction. It took two years, but we got a working model going and collected data on several refrigerants. I was then allowed to write my thesis and received my MS in 1965. During that time, I married my wife, Lucy, who had been teaching Home Economics in Ohio. I told Bill Fontaine I was getting married and asked if there were any job prospects for a home economist. Bill knew the head of the food services department at Purdue and was instrumental in Lucy getting a job in the food services area at X-dorm (currently Meredith Residence Hall). Not only did we have another paycheck coming in, but I also got to eat my dinners in a back room at the dorm—often joined by the Silver Twins during football season. Lucy's job also gave us access to the dorm one New Year's, so we could watch the Rose Bowl Parade and Purdue beat USC on a COLOR TV! Bill Fontaine convinced me that I should stay on at Purdue and pursue a Ph.D. My doctoral thesis work was on a rotating heat exchanger adapted to air conditioning. The fan design we used was a crossflow/tangential fan and there was not much design information available on that type of fan. The first months of work were thus spent developing design data for the fan and scroll. Once we had a suitable working fan then a version had to be developed with hollow blades both with and without fins. Building these devices was a nasty challenge for the Herrick Lab model shop. With their usual determination, Art Smith and his crew were able to fabricate parts that didn't leak and could be safely used. We were able to demonstrate that it was feasible to cool air using a circulating boiling refrigerant in the fan blades or likewise condense a refrigerant gas. There was a lot of interest in the concept from industrial visitors—they loved to stand at the fan outlet and feel cold air. Werner Soedel's

young son was also impressed and wondered why his dad didn't have a "machine" like Mr. Eisele. Tests were run, data was collected, and design curves were developed. (In those days the only computer was an IBM mainframe in the Engineering Administration building a half mile walk away with the wind in your face both directions. We had to haul a box or pack of punched IBM cards there and hope the program would execute.) I was then able to write my thesis, graduate, and get a job. To perpetuate a Herrick folk tale, I was interested in going to work for Whirlpool and people from Whirlpool engineering were interested in me. I unfortunately sent a letter to the corporate H.R. department and promptly got a letter indicating no openings. I was busy interviewing with other companies when Bill Fontaine one day asked me how the job hunt was going. I updated him, and he said, "you really should interview with this small company in Michigan, it is really growing and has great potential." I told him it sounded like Whirlpool and that they had already expressed no interest in hiring me. The rest is legend. Bill called Gale Cutler at Whirlpool and just about blew Gale out of his swivel chair. Next day I had an interview scheduled and subsequently a job offer which I accepted.

We settled into Saint Joseph, Michigan in January of 1969 and in November welcomed our first son, Bill. Bill was followed 19 months later by Ted (we had to make up for the time we lost in graduate school). While Lucy chased kids, I was in the Corporate Research group at Whirlpool doing just what I was trained to do at Herrick. In 1974 I was promoted to Director of Mechanical Systems Research and thus ended up managing engineers rather than doing engineering work. About this time, I concluded that I really needed to get product design and manufacturing experience. In 1975 Al Baillif, Whirlpool's VP of Engineering, helped me get the job of Director of Engineering for Cooking Products located at the Marion Division in Ohio. It was really a change from what I had been doing. Luckily the engineers in the department loved their cooking products and were the most dedicated and hard-working group I have ever managed. It was a good thing because in about two years we had to put a line of countertop microwave ovens into production followed by a line of electric freestanding ranges and keep the existing line of built-in products supported. In a way this group was like the students at Herrick—they worked hard and played hard. We used picnics, baseball games and Christmas parties to build a growing team. It is still hard to believe, but in the nine years I was in Marion the volume of cooking products, manufactured by Whirlpool, increased by 1000%. When I left we were selling 1 million units a year, making a nice profit, and cooking products was now another major product segment largely manufactured by Whirlpool.

Whirlpool loved to reorganize itself and in 1984 they reorganized engineering and I was named VP of Corporate

Alumni Reflections - Ed Eisele, MSME 1965, Ph.D. 1969 (continued)

Research. Unfortunately, my experience kept becoming a problem. I kept getting pulled away on special assignments. The first time was to lead the design team for the first full line of KitchenAid appliances after Whirlpool bought that business. I no sooner got done with that when one of Whirlpool's Vice Chairmen wanted to pursue a joint venture with Philips involving their appliance division. He needed a team to explore their business and determine its value to Whirlpool. I was put on the team. So off we went for about a year and a half traveling all over Europe-Italy, France, Germany, and the Netherlands. One heck of an experience but not good for my research job. In 1987 the stock market tanked and Whirlpool backed away from the joint venture. We all went back to our old jobs which looked dull by comparison to what we had been doing. Several years later the joint venture was put together. I jumped at a chance to join a group called Whirlpool Overseas Corporation which inherited the pieces of the Philips joint venture that didn't fall under the Americas or Europe. There were sales offices in Hong Kong, Thailand and Australia as well as kit factories in Morocco, North Africa and China. We also picked up responsibility for an automatic washer JV in Pondicherry India. I was VP of the Industrial side of the business. In 1992 Whirlpool decided to take on Asia in a bigger way resulting in me going to Singapore as VP of Technology. My assignment was to set up a technology center to support the business plans in Asia. We developed a diverse team concentrating on the design of automatic washers and refrigerators. As plans evolved, our main joint venture partners were in China and India. Over four years we hired engineers from Singapore, India and China and trained them to design appliances. In 1996 Whirlpool Technology began to look at a new organization to better support Whirlpool's expanding global business. In 1997 Whirlpool Technology reorganized to change to a global structure to better develop global product platforms. In the process of doing this the Singapore Tech Center became redundant and was shut down. The only good news was that Singapore had an unemployment rate of 0.5% so our staff found new jobs within weeks. Lucy and I spent 7 months in Hong Kong while I helped with the transition and we left to return to the U.S. right after the Hong Kong handover. I was planning to retire at that point. I was, however, asked to take the position of VP of Global Cooking Technology and agreed to do it but only for only two years. At the end of two years my boss said, "aren't you having fun, and don't you want to keep working" and I said "no". I thus retired at 57 after 30 years at Whirlpool and being part of the incredible growth that Bill Fontaine predicted many years ago.

Lucy and I decided to retire in Saint Joseph, Michigan. We started retirement with a 3-month trip to Hawaii, New Zealand, Australia, Singapore and England. I was glad I had retired when I did because our sons were now married and having children. For about a year and a half both sons were



Ed and Lucy Eisele with their grandchildren in Summer 2017

working in the U.K. Lucy and I had fun traveling to the U.K. and staying for long periods. We still miss the cozy inns in the Cotswolds and Christmases in London. Two of our grandchildren were born in the U.K., one in London and one in Nottingham. Both sons followed in my footsteps and became global workers. The older son had expat assignments in the U.K., Germany and China. He now lives in Detroit working for Lear Corporation. The younger son started working in Japan, then the U.K. and now lives in Seattle, Washington working for Microsoft. At least everyone is now in the U.S. We have a total of 5 grandchildren, two boys and three girls. Now our travel is mainly to see the kids and grandkids. We do, however, enjoy getting away to Florida for a couple of months while winter does its thing in Southwest Michigan. We are currently converting our Asia Room (we built it to hold all of the treasures Lucy acquired in Asia) into a first-floor master bedroom suite so we can "age in place" rather than having to relocate. We'll see how it works out.

This summer I finally gave in to my wife and cleaned out my old text books and course files. They resided in boxes in an attic off my office and had been moved many times. It was not easy to do, sort of like losing old friends. But, given that I had been retired 17 years I figured I probably wouldn't need to derive the Navier-Stokes equations again or teach a course. Going through the material was quite a trip down memory lane. Gas Dynamics taught by J.B. Jones--what a great teacher! Jack Chaddock's course on air conditioning and refrigeration, two volumes of files, both worth saving. Statistical Thermodynamics, which made me recall the day I arrived in class in November of 1963 and first learned that President Kennedy had been shot (Ken Wark still gave his lecture). The file on Non-Linear Problems in Engineering which was taught brilliantly by Bob Kohr who died too young. So now the many boxes of books and files have been reduced to one bookcase full that I still am not

Alumni Reflections - Ed Eisele, MSME 1965, Ph.D. 1969 (continued)

ready to give up.

Several overall thoughts occurred to me as I went through the boxes last summer and wrote this set of reflections. First, how lucky we were to have had such wonderful professors and staff at Purdue and Herrick who knew how to teach and wanted to. Second, did I really understand and do all that stuff!! Third, I wondered what was the most important experience we took away from Purdue and Herrick. Was it the book learning (all of those "backward sixes"!!)? Or was it learning how to manage a project, present findings and sell ideas? Or was it learning to get along with and share ideas with a diverse group of bright people? My guess is it was a mixture of the above. All I can say is that I know that the experience prepared me for a long and satisfying career.

---- Ed Eisele

Due to Ed and Lucy's gracious donation and their continued support of the Labs, the large second floor conference room in the new building was named the Edward and Lucille Eisele conference room. Thank you, Ed and Lucy!



Helen & Hilario Oh, Lucy & Ed Eisele, Lila & Ray Cohen, Anne & Jack Elson, & Patricia Davies at the Herrick Labs' Sculpture dedication July 2015



John Galbraith, Anil Bajaj, and Ed Eisele at the new Herrick Laboratories Building dedication in November 2013

Student Finds New Challenge - Ballroom Dancing



Aswin Ramesh, a Ph.D. student, decided last semester after he turned 25 years old to learn something new and fun, so he joined the Purdue Latin and Ballroom team to challenge himself. He writes "There is a total of 19 styles of dances from standard dances such as waltz and quickstep to Latin dances such as Cha Cha Cha and Jive. Learning together as a team and competing against other

universities brings back the competitive spirit that I had back in my undergraduate days while playing soccer for my college team. Last weekend, I competed in the Purdue Ballroom Classic which is the annual intercollegiate ballroom competition at Purdue, with Lia Tiscari who is a nursing major at Purdue. We practiced together for a couple of days and won a bunch of awards in the newcomer division". Congratulations, Aswin! You're a star!

Below is a video link from the finals of their waltz:

<https://www.youtube.com/watch?v=hgrvgP2u5rc>



Aswin and Lia dancing the waltz



Aswin and Lia with their many ribbons

Herrick Labs Alumni Picnic - August 7, 2017

Don and Rebecca Ufford and Doug Mandic co-hosted a Southern Michigan Herrick Labs Alunnni picnic BBQ at the Ufford's home on August 7. The co-hosts furnished a delicious meal for the approximately 40 people in attendance. The featured guests of honor were Patricia Davies and Stuart Bolton with special surprise guests Anil Bajaj, ME Head, and Bob Shriner, from the ME Development team. Herrick friends in attendance included Don Ufford, Doug Mandic, Ed Green, Tim Roggenkamp, Mike Albright, Pete Laux, Jason Wiederhold, Jim Lee, Murty Kompella, Nae-Ming Shiau, Pat Haggerty, Brad Pietrzak, Spencer Ackers, Trevor Brown, Bryan Glover, Dennis Schwerzler, Ed Eisele, and Dylan Stafford. Everyone had a great time catching up with old friends, sharing and hearing their stories of past exploits at the Labs. Here are a few pictures from the evening.

Rebecca's organization was superb and Doug and Don followed "orders" making everygthing run very smoothly. Stuart basked in Mike Albright's lovely "thanks to my professor" speech, while Anil and Patricia handed out handkerchiefs since there was not a dry eye in the house.

Thank you, Don, Rebecca and Doug!



Bob Shriner (ME Development) and Anil Bajaj, ME Head



*Tim and Terri Roggenkamp
Tim joined us at this year's Herrick IAC.*



Don Ufford, Pat Haggerty, Murty Kompello, Mike Albright, Stuart Bolton, Patricia Davies, and Doug Mandic



Don welcoming the picnic attendees



Jenny and Pat Haggerty, Doug Mandic, Pete Laux and son Josh, and Brian Davis



Jason Wiederhold, Murty Kompella, Nae-Ming Shiau

College of Engineering - Faculty Positions

There are several faculty position openings listed on the College of Engineering website - two in Mechanical Engineering. For the complete faculty openings list, visit the website: <https://engineering.purdue.edu/Engr/InfoFor/Employment>. There is also an opening in the shop (technical support). Here are the descriptions for the two ME faculty positions followed by the Engines Technician position.

Mechanical Engineering - Tenure Track Position

The School of Mechanical Engineering at Purdue University invites applications for a tenure-track or tenured faculty member at all professorial levels. We seek to attract exceptional candidates with interests and expertise in the areas of Acoustics and Noise Control, or Energy and Thermo-Fluid Transport and Systems. **Areas of interest for noise and vibration include:** control including active noise control; sound generation; sound field and noise prediction; auralization; product sound design; acoustical materials; impacts of noise; and bioacoustics. **Main interest for Thermo-Fluid Transport and Systems** is in expertise related to high performance buildings and communities including: advanced heat pumping technologies; optimal building controls; automated diagnostics systems; multiscale sensing; machine learning, and data analytics. The successful candidate will demonstrate a commitment of excellence in teaching and research.

Applicants considered must hold a Ph.D. degree in Mechanical Engineering or a related discipline and demonstrate excellent potential to build an independent research program at the forefront of their field, as well as potential to educate and mentor graduate and undergraduate students. Preference is for candidates with synergistic computational and experimental expertise that enables realistic engineering product and system performance predictions that facilitates product/system design optimization, and for candidates who can take advantage of the unique large-scale experimental facilities within Mechanical Engineering. Faculty members are expected to conduct original research, advise graduate students, teach undergraduate and graduate courses, and perform service both at the school and University levels. Candidates with experience working with diverse groups of students, faculty, and staff and have the ability to contribute to an inclusive climate are particularly encouraged to apply.

Established in 1882, the School of Mechanical Engineering is the oldest of Purdue's engineering schools and has granted over 28,000 degrees. Currently within mechanical engineering, there are 83 faculty members, around 1350 undergraduate and 600 graduate students. The School is known nationally and internationally for outstanding accomplishments in engineering research, education, and global engagement. It is a vibrant, multi-disciplinary community of scholars with a strong commitment of research and discovery, undergraduate and graduate education, and advancing diversity.

Purdue University's Mechanical Engineering is committed to advancing diversity in all areas of faculty effort, including scholarship, instruction, and engagement. Candidates should address at least one of these areas in their cover letter and indicate their past experiences, current interests or activities, and/or future goals to promote a climate that values diversity and inclusion.

Submit applications online at <https://engineering.purdue.edu/Engr/AboutUS/Employment/Applications>, including a cover letter, curriculum vitae, a 1-2 page teaching plan, a 1-2 page research plan, and names of at least four engineering or science professionals that can provide reference letters. For information/questions regarding applications contact the Office of Academic Affairs, College of Engineering, at coeacademicaffairs@purdue.edu. Review of applications began on November 15, 2017 and will continue until position is filled. A background check will be required for employment in this position. Nominations may be sent to Dr. Patricia Davies, Search Committee Chair, at daviesp@purdue.edu.

Purdue's main campus is located in West Lafayette, Indiana, a welcoming and diverse community with a wide variety of cultural activities, events, and industries. Purdue and the College of Engineering have a Concierge Program to assist new faculty and facilitate their relocation.

Purdue University is an EOE/AA employer. All individuals, including minorities, women, individuals with disabilities, and veterans are encouraged to apply.

College of Engineering - Faculty Positions (continued)

Mechanical Engineering - Professor of Engineering Practice

The School of Mechanical Engineering invites applications for a non-tenure track faculty position at the associate or full professor level. The successful applicant will be the Director of Senior Design leading the organization and teaching of the required senior-level design class, in which teams of students work on semester-long projects. The Director will develop partnerships with industry and sponsorships for projects, and provide guidance on student- and faculty-proposed projects regarding their suitability, scope, and educational value. The Director will work closely with staff and faculty to encourage innovation and entrepreneurship among students while they meet the design, build, and prototype objectives of the Capstone Design Program. The Director will work with faculty to benchmark peer programs, identify areas for improvement, and create new cross-disciplinary, vertically integrated, and humanitarian projects. The Director may also help teach other design related courses. The Director will demonstrate a commitment of excellence in teaching.

The successful candidate must hold, at a minimum, an MSME degree or an MS in a related field and have significant experience as a practicing mechanical engineer. Preference will be for candidates with advanced credentials (MBA, PhD etc.). Expertise in product design, project management, manufacturing, safety, reliability, and testing is highly desirable. The successful candidate will possess strong leadership and organizational skills, and have a passion for educating and mentoring young engineers, preparing them to be highly contributing members of their profession. People who have experience working in diverse groups, and can contribute to making work environments more inclusive are particularly encouraged to apply.

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Submit applications online at <https://engineering.purdue.edu/Engr/AboutUS/Employment/Applications>. Include a cover letter, curriculum vitae, design education and industry engagement plans, and names and contact information of at least four people you have worked with professionally who we may contact for references. For information/questions regarding applications contact the Office of Academic Affairs, College of Engineering, at coacademicaffairs@purdue.edu. Applicant review began on November 15, 2017 and will continue until the position is filled. A background check will be required for employment. Send nominations to Dr. Patricia Davies, Search Committee Chair, at daviesp@purdue.edu.

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Engine Test Cell and Lab Technician Opening - Herrick Labs

Engine Test Cell and Lab Technician- West Lafayette - Mechanical Engineering (Job Number 1701868)

Description:

The main focus will be working with faculty, students, and other technical staff to maintain and operate a suite of engine test cells in Herrick Labs. This position is integral to a research team to keep the engines, test cells, and equipment in good working order, run experiments, and supervise the safe operation of students in the test cell environment. Also works closely with students and other technical staff to teach students the practical side of engine operation, maintenance, and repair. Will also, occasionally, help and work with students and other technical staff on other experimental projects at the Laboratories.

Required Qualifications:

- Vocational/Tech or associate degree in Mechanical Engineering, Electrical Engineering Technology, or closely related field.
- Two years of experience in one or more of the following: engine teardown/rebuild, engine operation and performance, test cell operation, or research instrumentation.
- In lieu of degree, consideration will be given to an equivalent combination of related education and required work experience.
- Knowledge and experience with engine operation, performance, teardown, and rebuild, including significant experience running a highly instrumented engine test cell for performance and emissions work.
- An understanding of the principles of research and logical approaches to problem solving.
- An ability to work with researchers and other staff to identify and resolve technical problems in experimental research.
- Ability to help students and faculty design complex experimental research rigs and oversee fabrication, ensure quality control, and help develop safe operating procedures for such rigs.
- Ability to work with students in selection of appropriate scientific instrumentation and computer hardware and software.
- Knowledge of calibration and experimental measurements procedures.
- Strong interpersonal and communication skills and the ability to work effectively with a wide range of customers in a diverse community.
- Ability to communicate effectively, both orally and in writing.
- Ability to use Administrative and Technical Computer Software.
- Willingness to learn new things and be adaptable.
- Knowledge of chemical, hazardous waste, industrial hygiene, and/or environmental health standards.
- Knowledge of the use and maintenance of laboratory facilities and/or equipment.
- Technical skills in two or more of the following (including (b)): (a) Airconditioning and Refrigeration; (b) Automotive Systems, Engines and Power Generation Machinery; (c) Automated Building/Environmental Controls, (d) Experimental Controls Systems and Engineering Instrumentation; (d) Electrical Wiring; Electronics; Industrial Power Transmission; (e) Acoustics and Vibrations Experiments and Measurements, and (f) skills and/or sufficient knowledge to supervise all of the following activities: Carpentry, Machining, Plumbing, Sheet Metal Fabrication and Welding.
- A valid US or Canadian driver's license.

Preferred:

- BA/BS in a technical field.
- Experience and technical expertise in HVAC, Manufacturing processes, and/or machine design.
- Experience working with students and other technical staff, teaching and/or training.

Additional Information:

- Purdue will not sponsor an employment related visa for this position.
- A background check will be required for employment in this position.
- FLSA: Non-Exempt (Eligible For Overtime)
- Retirement Eligibility: PERF/Non-exempt Defined Contribution Plan
- Purdue University is an EOE/AA employer. All individuals, including minorities, women, individuals with disabilities, and veterans are encouraged to apply.

Ford Collaborates with Purdue on Automotive Research

Article posted in the 8/9/17 edition of “Inside Indiana Business”

Ford Motor Company has teamed up with Purdue University in a research alliance to set the course for the future of the automotive industry. One of the areas Purdue specializes in: Testing the noise and vibration of car seats at Herrick Labs.

The article below was posted August 9, 2017 on “Inside Indiana Business” with Gerry Dick. The website is below: <http://www.insideindianabusiness.com/story/36097125/ford-taps-purdue-to-help-navigate-new-auto-industry>

Ford Motor Co. believes the traditional automotive business model is evolving. While the company says consumers buying a car and driving it themselves will persist, an emerging transportation model champions shuttles, car-sharing and smart urban transportation systems—with the end game being autonomy. Ford is hungry for innovative ideas being developed outside its walls—and that’s why the auto giant hand-selected Purdue University to help blaze the trail.

“Ford is working very hard to figure out where we can most effectively play and win in that emerging market, in addition to remaining very strong in the existing market most of us are familiar with, where you buy and drive your own car,” says Ford Global Manager for External Alliances Ed Krause.

One strategy for finding its way in the evolving auto industry involves partnering with universities throughout the world. Purdue and Ford have worked together for many decades, but are now launching a research and development alliance to deepen the collaboration. Purdue leaders say past work operated on “a project by project basis,” but the alliance now involves more comprehensive, longer-term projects.

“That makes it worth the time of our faculty and [Ford’s] engineers and scientists to work very closely together to co-develop projects,” says Purdue Chief Corporate and Global Partnerships Officer Dr. Dan Hirleman. “The alliance is a long-term commitment to just a small number of university partners—about 10—rather than the field of competition being 200 or 300 universities.”

The partnership represents an ongoing evolution in the automaker’s philosophy. Krause says, historically, Ford was “possibly the most vertically-integrated manufacturing company ever.” The Ford River Rouge Plant in the Detroit area once employed 100,000 people and for decades was the largest integrated factory in the world.

“Iron ore, coal and wood would go in one end, and cars would come out the other,” says Krause, “but, over time, that intensely vertically-integrated model had to evolve.”

Krause notes the company now seeks “world-class expertise,” both internally and, increasingly, externally.

“Ford, in recent decades, has been one of the leaders in recognizing that no matter how big or vertically-integrated you are, more and more of what companies need to compete and win is being developed outside our own walls,” says Krause. “Working with world-class partners—universities being very important among them—is essential.”

Likewise, Purdue says Ford’s market knowledge informs its research, and ultimately steps on the gas when it comes to commercializing university discoveries.

“Working with a leading company like Ford brings the most current problems and the most futuristic directions that the companies are thinking about. That’s great for our students to be entrained in leading-edge research as part of their graduate studies, which means they’re prepared,” says Hirleman. “Additionally, a quarter of our research funding at Purdue comes from the private sector, so that means, roughly, a quarter of our grad students and the equipment they use is funded by the private sector.”

The first phase of project proposals is now underway; Ford is considering about 60 ideas from Purdue, with areas of focus ranging from autonomous systems to the psychology of ride-sharing. While Ford is “particularly impressed” with Purdue’s strengths in NVH (noise, vibration and harshness) and composites, Krause says the school’s breadth of expertise makes it an exceptional partner.

The automaker is now match-making experts at the university, and will be selecting teams and projects to help map its journey in an evolving automotive industry.



Prof. Patricia Davies and her student, Jelena Paripovic prepare a vibration experiment; the work will help build car seat models to optimize comfort and vibration isolation

People News

Faculty Honors & News



Andres Arrieta

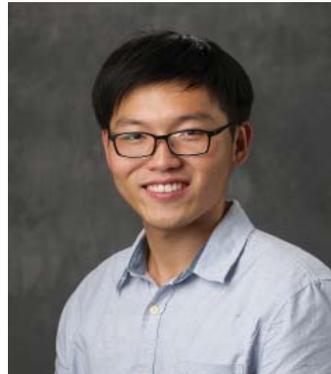
Prof. Andres Arrieta along with Falk Runkel, Giulio Molinari, and Paolo Emanni of ETH Zurich were awarded the 2017 Best Paper Award in Dynamics and Control of Adaptive Structures for their paper titled “Novel Chiral Structure with Tailored Mechanical Response Exploiting Elastic Instabilities”. The award is organized by the ASME Technical Committee on Adaptive Systems Dynamics and Control which chooses from all the papers

presented during the Conference on Smart Materials, Adaptive Structures and Intelligent Systems SMASIS2016 on the topic of Dynamics and Control of Adaptive Structures for the year 2016.

Andres's paper titled “Tailorable Stiffness Chiral Metastructure” was published in *Physica Status Solidi (RRL)*, 147:274-285, 2017. The paper is the cover of the October 2017 issue of the prestigious journal *Physica Status Solidi Rapid Research Letters*.

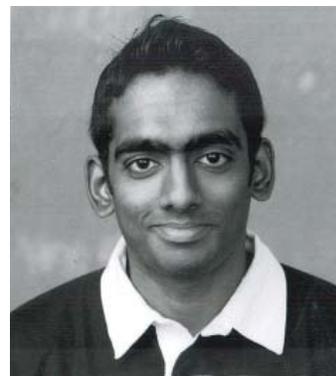


Student Honors & Awards



Haitian Hao

Haitian Hao, a Ph.D. student advised by Prof. Fabio Semperlotti, was selected as a recipient of the 2017 Estus H. and Vashti L. Magood Award for Excellence in Teaching. The honor recognizes outstanding teaching assistants and instructors and the selection is made by both faculty and students to recognize those students who were exemplary in their work as teaching assistants or instructors.



Aswin Ramesh

Aswin Ramesh, a Ph.D. student advised by Prof. Greg Shaver received the Helen and Marvin Adelberg Fellowship for the period of August 1, 2017 to July 31, 2018. This fellowship covers his stipend and allows him to accept a research supplement that provides an added monthly stipend.



Eckhard Groll

Prof. Eckhard Groll along with his student Nick Salts (picture at bottom right) won a paper award at the 10th International Conference on Compressors and their Systems. Their paper titled “System Solution to Improve Energy Efficiency of HVAC Systems” was voted as one of the three best papers based on a review process by an external scientific panel. The paper was co-authored by

Ludovic Chretien and Roger Becerra both from Regal Beloit Corp., the research sponsor.



Nick Salts

Nick Salts, a Ph.D. student along with his advisor, Prof. Eckhard Groll won a paper award at the 10th International Conference on Compressors and their Systems. (see description under Eckhard Groll's news item.)

People News (continued)

Graduations

Anderson, Aaron (MSME 2017) Design of a Twisting Multi-Stable Actuator. Aaron took a position with Harris Corp. in Ft. Wayne, IN

Bajaj, Nikhil (Ph.D. 2017) Microresonator-Based Sensors with Feedback-Enabled Nonlinearities. Nikhil is working as a Post Doc at the Labs.

Blatchley, Tim (MSME 2017) Secondary Loop Residential Heat Pump Design, Performance, and Cost Analysis Utilizing R290. Tim is working for Ford Motor Co., Dearborn, MI.

Cao, Rui (Ph.D.2017) Investigation of Noise and Vibration in Tires through Analytical Modeling, Tests and Simulations. Rui's employment is unknown at this time.

Fleck, Trevor (MSME 2017) Additive Manufacturing of Energetic Materials and Its Uses in Various Applications. Trevor is staying at the Labs for his Ph.D. studies.

Henry, Ashwin (MSAAE 2017) Compliant Based Morphing Structures: Actuation and Selective Stiffness Aero-Structural Studies. Ashwin's employment is not known at this time.

Jain, Kaushal (MSME 2017) Modeling of NH_3 Storage in Vanadia-Based SCR Catalyst for Urea-Dosing Control in a Diesel-Electric Hybrid Car. Kaushal is staying at the Labs for his Ph.D. studies.

Joshi, Mrunal (MSME 2017) Diesel Engine Cylinder Deactivation for Improved Systems Efficiency While Maintaining Elevated Aftertreatment Temperatures. Mrunal is staying at the Labs for her Ph.D. studies.

Liu, Wei (Ph.D. 2017) Inverse Design of Enclosed Environment by CFD-Based Adjoint Method. Wei took a faculty position at ZJU-UIUC Institute, Zhejiang University, China.

Menghmalani, Yeshaswi (MSME 2017) Dynamic Modeling and Validation of Power Generators. Yesh is working for Cummins Inc. in Columbus, IN.

Novotny, Whitney (MSME 2017) Inkjet Printing of Metallic Initiators. Whitney is working for Walt Disney Company in Lake Buena Vista, FL.

Patil, Akash (MSME 2017) Development and Evaluation of Automated Virtual Refrigerant Charge Sensor Training Kit. Akash is staying at the Labs for his Ph.D. studies.

Tao, Hongcheng (MSME 2017) Dynamic Behavior of Discontinuous Metamaterial Unit Cells. Hongcheng is staying at the Labs for his Ph.D. studies.

Udani, Janav (AAEMS 2017) Dynamics and Control of Bi-Stable Structures. Janav is staying at the Labs for his Ph.D. studies.

Weddings



Austin Nash (Ph.D. student working with Prof. Neera Jain) and Caitlin Hauger were married on October 14, 2017 at Rose-Hulman Institute of Technology in Terre Haute, IN. Caitlin works at IU Health in Indianapolis, IN.

Engagements



Alex Taylor (current Ph.D. student) and Mukta Kulkarni (MSME 2016) were engaged on November 12, 2017 and are planning to marry in India in December 2018.

Births



Professor Bin Yao and wife, Lan welcomed their first child - a beautiful baby girl on July 26, 2017. Angela weighed 7 lb. 4 oz. and was 21 in. long. Mom and baby are doing well. and adjusting to staying awake to have Angela well fed and happy.

CONGRATULATIONS!

2018 Purdue Conferences - July 9 - 12

Mark your calendars for the 2018 Purdue Conferences hosted by Herrick Laboratories! The 24th International Compressor Engineering Conference, 17th Refrigeration and Air Conditioning and 5th International High Performance Buildings conferences will take place simultaneously July 9-12, 2018 in Stewart Center at Purdue University. In 2016 we welcomed over 750 guests from 30 different countries to our 4 day conference, where over 450 papers were presented.

This summer, the organizing committee announced the 2018 deadlines, and opened the abstract submissions. To learn more about the conferences, visit: engineering.purdue.edu/HerrickConf. To submit an abstract for review, please visit: www.conftool.com/2018Purdue. See list on the right for the deadline schedule .

For general information on the conferences, go to website: <https://engineering.purdue.edu/Herrick/conferences>.

If your company is interested in pursuing an event sponsorship with the conferences or if you have any questions regarding the 2018 Purdue Conferences, please contact:

Kim Stockment
Conference Coordinator
Ray W. Herrick Laboratories
Purdue University
177 S. Russell St., West Lafayette, IN 47907-2099
Ph: 765/494-6078; Fax: 765/494-0787
Conference E-mail: hlconf18@purdue.edu



Lab tours at the conferences

KEY DATES:

Abstract Acceptance Notification: January 29, 2018

Manuscript Submission Deadline: April 2, 2018

Manuscript Acceptance Notification: April 30, 2018

Final Paper Upload: May 21, 2018

Conferences: July 9 - 12, 2018

Short Courses/Workshops: July 8, 2018



2016 Conference attendees enjoying unches



Dr. Manpreet Singh delivering one of the keynote speeches at the 2016 Conference

Donate to Herrick Labs

Donations to the Labs are always welcomed and appreciated. If you're interested in making a donation, below is some helpful information for you. For all of you who have contributed in the past: my sincere thanks. Your gifts help to create groundbreaking research and set a wonderful path to the future. Thank you for coming on board!

Be sure you specify your gift is for Herrick Labs. You are also welcome to support a specific professor's research, or support a few established funds:

- * Herrick Laboratories Building Fund
- * Herrick Laboratories General Operations
- * Ray Cohen Excellence in Thermal Systems Fund
- * William E. Fontaine Student Fellowship Fund

Giving by mail? Send your check to the address on back page of this newsletter, payable to the Purdue Research Foundation, with "Herrick Labs" and any additional designation on the memo line. Want to make an online gift? You can find details at the website: <https://engineering.purdue.edu/ME/Giving/GivingGuide>.

Specific questions about giving? (stock options, estate planning, deferred gifts, etc.) Purdue has philanthropy experts solely assigned to Mechanical Engineering who can help you! Contact the Director of Development, Scott Banfield at (765) 494-5629 or visit Mechanical Engineering's website at: <https://engineering.purdue.edu/ME/Giving/index.html>.

Below is a message from President Mitchell E. Daniels, Jr. concerning the Ever True Campaign for Purdue University Together, We Are Purdue!

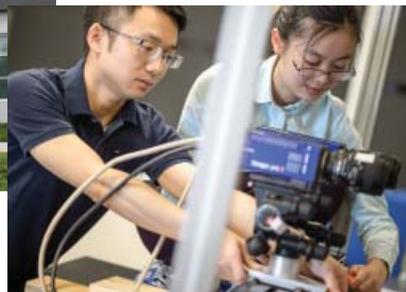
Ever True: The Campaign for Purdue University is an invitation to the Purdue family to join together, through private giving and personal involvement, to boldly advance our University as a national and global leader that continues to move the world forward.

With a goal of \$2.019 billion, Ever True is the largest fundraising effort in Purdue history. The campaign spans July 1, 2012, through June 30, 2019, concluding in the University's 150th anniversary year.

This campaign will propel the Purdue Moves initiatives—Affordability & Accessibility, STEM Leadership, World-Changing Research, and Transformative Education—and reinforce the University's overarching commitment to keep a rigorous college education within students' financial reach.

To learn more about this campaign, visit:

<https://securelb.imodules.com/s/1461/campaign/start.aspx?sid=1461&gid=1010&pgid=3082>





Ray W. Herrick Laboratories
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USA

Address Service Requested

News about You and Address Changes

We are always interested in hearing your news, like weddings, births, and job promotions, and we want to be kept up-to-date on current addresses. Please send notes to Donna Cackley or to the e-mail address below. Don't hesitate to let us know of other alums that have moved or changed jobs. Photos are always welcomed and encouraged.

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to Patricia Davies at the above address.