



newsletter

Ray W. Herrick Laboratories

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Research of Newest Faculty Member

In our last newsletter, we introduced Greg Shaver, our newest faculty member. He combines an expertise in combustion and control to study and develop advanced powertrain solutions that allow the efficient and clean use of conventional fuels, coal-derived fuels and biofuels.

His research interests and work can help resolve problems of air quality/environment and dependency on importation of fuels. The production and release of greenhouse and smog-generating gases, including carbon dioxide (CO₂) and oxides of nitrogen (NO_x), are still major issues as the number of people and their energy needs continue to increase. There is a substantial opportunity to reduce the amount of carbon and smog-generating chemicals released into the atmosphere by concentrating on cleaner and more efficient transportation strategies. An additional opportunity exists to reduce dependence on foreign sources of transportation fuel by developing the capability to cleanly and efficiently use domestic fuels stores, including agriculturally-derived biodiesel, ethanol and coal-based fuels.

His current projects include the modeling and control of Homogeneous Charge Compression Ignition (HCCI), and a Cummins-funded project addressing the characterization and accommodation of biodiesel fuel blends above 20 percent. These research efforts require expertise in both combustion and controls engineering which, historically, have been separate specializations within Mechanical Engineering. Graduate students under Greg's supervision will be exposed to both areas in their coursework and laboratory research. These experiences will put his graduate and undergraduate students in a unique position to tackle interesting and important transportation challenges in combustion control.

Greg very much enjoys working with his colleagues in Mechanical Engineering and other Engineering Schools and sees Purdue as the perfect place to tackle these interdisciplinary problems. He is also very excited about working with industry to solve difficult problems. You will find him to be high energy, responsive and collaborative. If you are interested in talking to Greg about his research, contact him at

the address on the back of the newsletter or send him e-mail gshaver@purdue.edu.

Upcoming Events

Eckhard Groll is helping organize the **10th Annual Colloquia on International Engineering Education** scheduled for November 1-4, 2007 at the Stewart Center on the Purdue campus. The theme for the colloquium is "Curricular Innovations for Global Engineering Competency." The deadline for submission of proposed colloquium contributions is May 26, 2007. For the latest information, please visit the Web site <https://engineering.purdue.edu/GEP/ACIEE/>.

The **Herrick Laboratories' Industrial Advisory Committee** will meet on November 8-10, 2007. The meetings will end with the traditional football game. This year, Purdue will take on Michigan State at home.

The Purdue **2008 Compressor Engineering Conference and the Refrigeration and Air Conditioning Conference** will be held on July 14-17, 2008. The biannual **Short Courses** will be held on July 12-13, 2008. For current information, please visit the Web site <http://meweb.ecn.purdue.edu/Herrick/Events/>.

Herrick Laboratories' 50th Birthday Celebration will be held on July 18-19, 2008 immediately following the compressor and refrigeration conferences. Mark your calendars and plan to attend the festivities. Look for more information in future newsletters.

Werner Soedel Retires

Werner Soedel has started his "half time" retirement by only teaching in the Fall semester. He does not want his retirement to be marked by a big event. We would, however, like to present him with a book of messages from well wishers. If you would like to send a letter or photographs for us to include, please send them to Judy Hanks at the address on the back page of this newsletter or by e-mail to hanks@purdue.edu.

Werner is not resting on his laurels. His new book was recently released. Please see page 6 for more details.

Tribute to Aladene Fontaine

We were saddened to learn that Aladene Fontaine passed away on February 2 at the age of 100. The Fontaines contributed so much to what the Herrick Laboratories are today that we wanted to pay tribute to Aladene. The obituary appeared in the February 5 edition of the Lafayette newspaper, *Journal and Courier*. Below are edited excerpts from that.

Martha A. Fontaine, 100

Martha Aladene Fontaine, 100, of West Lafayette, died Friday, February 2, 2007, at Westminster Village. She was born September 2, 1906, to the late James L. Wilson and Nancy C. Wilson in Brazil, Indiana. She was a 1924 graduate of Brazil High School and received her bachelor of arts degree in music from DePauw University in 1928.

She was married to William E. Fontaine, the first Director of the Ray W. Herrick Laboratories. Bill died in 1993.

Aladene was a member of Alpha Gamma Delta, where she held the office of both president and chairman of the advisory board.



Bill and Aladene Fontaine from the Herrick photo archives.

Aladene was also a piano teacher and was an Alpha Gamma Delta convention pianist and contributed several original songs to their songbook. She was also a member of the Purdue Women's Club and enjoyed foreign travel, flower gardening and wintering with her husband, Bill, in Florida on Sanibel Island. Since moving to Westminster Village in 1995, she regularly played music for Sunday vespers and volunteered weekly in the flea market.

The family suggested that memorials may be given to Westminster Village in West Lafayette for the employee Christmas Fund. The address is 2741 North Salisbury Street, West Lafayette, Indiana 47906.

If you would like to send your condolences to members of Aladene's family, please send your cards and letters to us, and we will be forward them to her son, Dick Fontaine, and daughter, Julie Golding.

Over the years, many of the Herrick Laboratories' alums have asked about Aladene, remembering her kindness and her sharp wit. Here are some thoughts that people have shared with us on hearing of Aladene's passing.

Thoughts of Aladene

—Ray and Lila Cohen

Ray's first experiences that he remembers with Aladene, as everyone called her, was when he was assigned to a Mechanical Engineering "Better Teaching" Committee that Bill Fontaine chaired in the early 1950s. However, his first major contacts came later in the early 1960s when he joined Bill's newly formed Herrick Laboratories. That started a half century of friendship with the Fontaine family that influenced the Cohen family in a positive way beyond what is normally expected of families of colleagues at Purdue. When Lila joined the Cohen family in 1986, she was welcomed into the Fontaine-Cohen extended family just as if she had been part of the families 20 years before. This colleague-family relationship was due greatly to the part that Aladene played in the friendships.

We remember Aladene, as did many others, as a wonderful partner for Bill who enhanced his position as Director of the Herrick Labs, always at his side as more than his social secretary with advice, friendship, and humor for everyone they had contact with.

Ray remembers an incident after the Cohens moved to a house close to the Fontaine home. Ray walked over to see Bill one Saturday afternoon, and was greeted by Aladene's mother who was visiting for the week. Aladene's mother greeted him after answering the door bell. At that time she was well into her 90s, so we were not surprised at all to see Aladene live to be 100.

Lila and Ray both remember being invited to have dinner at her table when we were first introduced to her famous "bean salad." We have passed on the recipe for that salad to many others who asked for it, all of whom have enjoyed using it. In the spirit of remembering Aladene for her many talents, we pass it on to you.

Aladene's Bean Salad

1 can sliced green beans 1 can garbanzo beans
1 can sliced yellow beans 1 small onion chopped
1 can red kidney beans 1 small jar sliced pimento
1 cup finely chopped celery 1 green pepper cut in pieces
1 can white whole kernel corn

Marinade:

3/4 cup sugar 1/3 cup oil
2/3 cup cider vinegar Salt and pepper to taste

Drain all of the beans and corn, empty into a bowl, add remaining ingredients, refrigerate overnight. Makes 3 quarts. Enjoy!



From left to right are Bill Fontaine, Aladene Fontaine, and a young Ray Cohen.

My Favorite Memories of Aladene

—Bob Bernhard

Aladene Fontaine was a wonderfully warm and intelligent person. We came to West Lafayette in 1982. In the early years Bill Fontaine would stop by my office to chat when Aladene went to get her hair “frizzed” and we struck up a great friendship. On occasion I would play hooky and go over to the Fontaine house to watch the Chicago Cubs baseball game with Bill. Aladene and I always had great chats on my way down to the basement television room. Sometimes these chats lasted long enough that Bill would holler up the stairs that Aladene needed to let me come downstairs. Later, as the Director of the Herrick Labs, I would call Aladene to attend the Industrial Advisory Committee banquet. She would always say, “Oh you don’t want an old person like me” but she would come. I don’t know if she enjoyed the party but she always seemed to fit in and we enjoyed having her with us. I was always impressed by Aladene’s awareness, intelligence and humility as well as her wonderfully sharp sense of humor. I often watched

Aladene quietly size up a situation and insert a few words of clarity or comfort into a situation at just the right time. Aladene was one of those bigger than life people. I’m glad to have known her and thank her for all of the gifts she gave me and the people of the Herrick Labs.



Aladene Fontaine and Marlene Hodge who was Administrative Assistant to the Director before she retired.

The Best Piano Teacher I Ever Had!

—Debbi Bernhard

I treasured my weekly, “girls night out,” years ago when I had the good fortune to be taught how to play the piano by Aladene Fontaine. I affectionately told others that she was the best piano teacher I had ever had. She in return told people I was the best piano student she had. Although my compliment was sincere, her compliment to me was true only because at 89 years young, I was the only piano student she had. I will never forget the evening we were reduced to child like giggling as we attempted our first duet together. Did I mention how extraordinary her patience was?

Aladene, like her husband Bill, was a wonderful teacher. She taught me numerous lessons beyond those of playing the piano. The way she led her life with honesty and integrity was a lesson in and of itself. At an age when many people become narrow minded and conservative, Aladene was amazingly open minded and understanding. She never would “sweat the small stuff.” She conveyed the importance of God, family, and friends through countless stories, all told with a sparkle in her eye and a grin on her face. Aladene’s sense of humor was quick and ever present. She was my ray of sunshine each week—my hero forever. She was not only the best piano teacher but the best teacher and friend.

Continued on next page.



Aladene Fontaine and Avery Norfleet, former Shop Supervisor now retired.

Memories of Aladene

—Pat Coates

While my future husband, Don Coates, was a student at the Herrick Labs under Ray Cohen's and Bill Fontaine's tutelage, Bill's wife, Aladene, was an important part of my life in the first pledge class of Alpha Gamma Delta Sorority at Purdue.

Aladene was an active alum who shared her musical talents with the local Beta Xi chapter, even writing a song that's still part of the sorority heritage. She shared her quick wit and enjoyment of life while instilling in us the importance of development of our own purpose and potential. Almost forty years later Don and I have very happy memories of both Aladene and Bill.

The Fontaine Legacy at Herrick

In 1994, one year after Bill Fontaine passed away, the William A. Fontaine Fellowship was established in memory of Bill Fontaine, the founding Director of the Herrick Labs, to encourage the efforts of deserving graduate students at the Ray W. Herrick Laboratories.

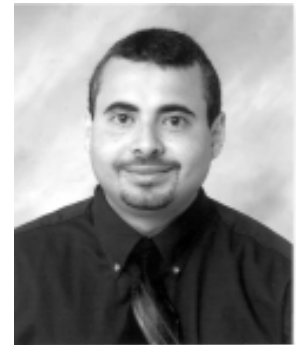
To receive this prestigious award, a student must be doing, or intending to do, thesis based research on a problem of interest to industry exclusively at the Ray W. Herrick Labo-

raries. The applicant may be a candidate for the M.S. or Ph.D. degree, and also exhibit some of the leadership and community building skills that Bill possessed.

With Aladene's passing, the Ray W. Herrick Laboratories have already received several gifts for the Fontaine Fellowship Endowment. Two of those gifts in memory of Aladene are from former Herrick Directors, Bob Bernhard and Ray Cohen. If you would also like to contribute to the fund in memory of Aladene, please make your check payable to Purdue Foundation and indicate on the check that it is for the Fontaine Fellowship Endowment Fund in memory of Aladene Fontaine. Please send it to the address on the back of the newsletter.

Miguel Jovane Fontaine Fellowship Recipient

The last time the Fontaine Fellowship was given was in 2004, when it was awarded to Miguel E. Jovane. Miguel is a current Ph.D. student working under the supervision of Jim Braun and Eckhard Groll. Miguel came from Panama in August of 2000, and joined the Herrick Laboratories in the summer of 2001; he received a master's degree in August 2002. For his master's thesis, Miguel worked on studying the possibility of extracting the vapor from the two-phase refrigerant flow stream of an evaporator coil. The advantages and disadvantages of extracting the vapor from the stream were analyzed in his work. For his doctoral dissertation, Miguel is doing research on a novel rotary compressor designed by LG Electronics. The study includes the use of analytical tools to determine the main sources of energy losses and determine possible ways to improve the energy efficiency of the compressor. After completing his Ph.D. degree, Miguel plans to pursue an academic career and hopes to apply, wherever he goes, the philosophy and culture of the Herrick Laboratories: that culture that Bill and Aladene Fontaine started building almost 50 years ago.



Miguel Jovane, most recent recipient of the Fontaine Fellowship.

Student Research

—Adapted from an article by Emil Venere, Purdue University News Service

Research aims to calm your car's rattling

Researchers at Purdue University are getting close to eliminating those rattling and squeaking noises in your car's headrest and other components, major sources of consumer dissatisfaction that automakers would like to eliminate.

According to Professor Doug Adams and graduate student Janette Jaques, the headrest and its seemingly simple adjusting mechanism have proved surprisingly complex. They have applied mathematical models that simulate rattling headrests for analyses aimed at reducing vibration and enabling designs that eliminate the annoyance.

"If you are driving down the street and something is rattling or squeaking, the perception is that the vehicle is of poor quality. So, quality and noise and vibration sort of go hand-in-hand. Virtually every car has headrests, so this problem is particularly interesting," Doug said.

The same modeling and experimental techniques developed for the research could be used to reduce squeaking and rattling in other components, such as instrument panels, seats, transmission gears, suspension components and seatbelt mechanisms.

"A car has thousands of parts," Doug said. "Any time you have one component sitting next to another and they're not welded together, you've got the potential for them to hit one another, causing rattling. It's an industrywide problem."

The headrest, which is held in place by a small pin that fits into slots in one of the two posts connecting the headrest to the seat. "The mechanism has to be rigid enough to keep the headrest from falling down, but not so rigid that you can't easily adjust it. In other words, you have to put some mechanical free play into it, but you can't put too much because then it rattles," Doug said.

The model contains four equations corresponding to four key structural elements in the headrest system, making it possible to simulate headrest vibration. The engineers have tested their model by comparing its predictions with data recorded when shaking a car seat with hydraulic shakers.

"We used the model to identify how susceptible a certain

design would be to rattle," Doug said. As the seat shakes, the headrest adjustment pin rattles inside the plastic housing. The model provides information about two key rattling phenomena: how many times per second the pin hits the sides of the housing and how hard the pin hits the plastic housing. The model also simulates how the headrest rattles depending on its mass and other design characteristics.



Janette Jaques attaches a sensor to a car seat headrest mounted to a hydraulic shaker. As the seat is shaken, sensors record the vibration data used to validate results from a computational model that simulates the vibration.

Determining precisely which vibration frequencies are causing the headrest to rattle could enable automakers to better "tune" automotive suspension systems, altering the stiffness of shock absorbers and coils to reduce the rattling. "Or, one of the main things you could do is modify the design of the headrest itself, which is our objective," Doug said. "The main motivation here is to develop a modeling technique where you could do most of the design work before you ever built a prototype. Reducing the amount of building and prototype testing would save you a lot of money, time and frustration.

"You need a model because there are so many potential ways to fix the problem. Imagine trying to do this study entirely by building and testing prototypes."

Increasing the mass of the headrest might be one approach to reduce the rattling, a design change that could be tested with the model. The model also could be used to learn whether the rattling might be reduced by increasing the friction or stiffness of the adjusting pin.

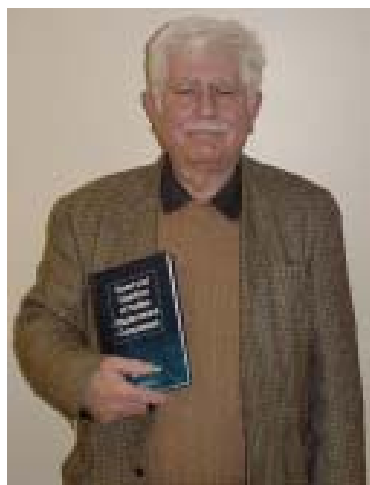
"We determined that it is practical to use a model for designs that reduce rattling, spending less time and money building and testing, and cutting down on the frustration of trying to find a needle in a haystack," Professor Doug Adams said.



Herrick Faculty Author Books

Werner Soedel

In January 2007, the book *Sound and Vibrations of Positive Displacement Compressors* by Werner Soedel was published by CRC Press, Taylor & Francis Group, 600 Broken Sound Parkway, NW, Suite 300, Boca Raton, Florida 33487. The internet address of the book's description on the CRC Web site is: http://www.crcpress.com/shopping_cart/products/product_detail.asp?sku=7049. The book is 342 pages long, and costs \$159.95 plus tax and shipping.



Werner Soedel poses with his

The book contains chapters on the overview of noise source and transmission mechanisms by compressor type, natural frequencies and modes of compressor housings, effects due to asymmetry, desirable design modifications, the forced response of compressor housings; and free and forced vibrations of compressor casings, discharge and suction tubes, and support springs (spring surge). Other important chapters are devoted to the vibrations

and design of compressor valves, and to the analysis and design of gas pulsation mufflers. Additional chapters include topics on sound radiation, internal acoustics, etc.

The book is somewhat slanted toward hermetically sealed refrigeration and air conditioning or heat pump compressors because of the large amount of research that has been done by this industry. This slant is reflected in the chapter on the compressor housing (the hermetic compressor shell) because air and nontoxic gas compressors are, as a rule, not hermetically sealed. But many topics, such as muffler design or the influence of valve impact on compressor casing vibrations, are of equal interest to air and gas compressor specialists.

Obviously, different types of compressors exhibit different sound and vibration effects, but there is enough commonality to justify somewhat the general approach of the book: most refrigerating and air conditioning compressors have a hermetically sealed housing, are mounted on isolation springs, produce gas pulsations, employ valves, experience

casing vibration, and so on, and similar sound- and vibration-producing features are also found in air and gas compressors. In the introductory chapters certain differences between reciprocating, rotary vane, rolling piston, scroll, and screw compressors are discussed. (This does not mean that there are not other designs deserving equal attention, but a somewhat subjective choice had to be made to limit the scope of the book.) Still, many of the mechanisms that are present in the compressor types discussed are also present in other types of compressors.

While by no means complete, the book contains a list of 261 references, many from the proceedings of the international compressor engineering conferences held biannually at Purdue University.

By the way, Werner Soedel's other well-known book *Vibrations of Shells and Plates* now in its third edition; it is also available from CRC Press.

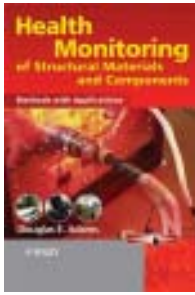
Doug Adams

In April 2007, the hardcover book *Health Monitoring of Structural Materials and Components: Methods and Applications* by Doug Adams was published by John Wiley & Sons (ISBN 9780470033135). The internet address of the book's description on the John Wiley & Sons Web site is: http://www.wiley.com/go/adams_health. This 512 page book is the first complete introduction to health monitoring, encapsulating both technical information and practical case studies spanning the breadth of the subject.

Health monitoring is the scientific process of identifying the loading and damage in engineered components and then predicting the engineering performance of those components as they operate. Health monitoring technologies are increasingly being used to certify engineered systems like ground vehicles and aircraft, and also enable condition-based maintenance in these systems to reduce operating costs and ensure safety. A suite of methods and applications in loads identification (usage monitoring), *in-situ* damage identification (diagnostics), and damage and performance prediction (prognostics) is presented. Concepts in physics-based mod-



Doug Adams' book was released in April.



eling of vibration and wave propagation, dynamic measurements and sensing, and data analysis are applied through real-world case studies to examine engine components, automotive accessories, aircraft parts, spacecraft components, civil structures, and defense system components.

The book also includes end-of-chapter problems to enhance the study of the topic for students and instructors. An accompanying Web site with a large collection of MATLAB® programs also provides hands-on training to readers for writing health monitoring model simulation and data analysis algorithms. Practitioners and researchers, those with a greater understanding and application of the technical skills involved, will also find that this book is an excellent reference text to address current and future challenges in the field. The wide variety of case studies will appeal to a broad spectrum of engineers in the aerospace, civil, mechanical, machinery, and defense communities.

Kai Ming Li

Predicting Outdoor Sound written by Keith Attenborough, Kai Ming Li and Kirill Horoshenkov was published at the beginning of the year by Taylor & Francis (ISBN 978-0-419-23510-1). The 456 page book is available at major bookstores. *Predicting Outdoor Sound* provides a scholarly yet practical examination of the phenomena that affect outdoor sound close to the ground and its prediction. Theories and data are brought together to give both researchers and practitioners the basis for deciding which model to use in a given situation.

The subject of outdoor sound propagation is of wide-ranging interest not only for noise prediction but also in studies of animal bioacoustics and in military contexts. The purpose of the book is to provide a comprehensive reference about aspects of outdoor sound and its prediction that should be useful to practitioners, and yet is also useful to academics working in this field. It is based on a joint experience of more than 50 years of research and consultancy. Many current prediction schemes for outdoor sound are empirical. To some extent this is understandable in view of the complicated source characteristics and complex propagation paths that are often of interest. Yet there has been significant progress in theories and



computational methods for the various phenomena that are involved. These theories have been validated extensively by comparison with data and help with our understanding of the important effects. No current text is devoted to bringing the leading theories and data together, and existing texts do not provide the practitioner with the basis for deciding which model or scheme is appropriate to use in a given situation. This book is a step towards remedying both of these deficiencies.

The book covers recent advances in theory, new and old empirical schemes, available data and comparisons between theory and data. Where possible, examples of results of the application of prediction schemes have been included. Enough of the background theoretical detail is available to make the reader/user aware of the inherent approximations, restrictions and/or difficulties of any of the prediction methods being discussed.

There are chapters on ground impedance models and data, methods of measuring ground impedance, ground effects in homogenous atmospheres, sound propagation in refracting and turbulent atmospheres, sound propagation from moving sources, the performance of outdoor noise barriers, the effects of tall vegetation and both numerical and empirical methods for predicting the various influences on outdoor sound.

Anticipated Book

Professor Jim Braun is working with Professor John Mitchell from the University of Wisconsin on a book that is entitled *Design, Analysis, and Control of Space Conditioning Equipment and Systems*. The book is near completion and is expected to be published by Wiley within the next year. It will serve as a textbook for undergraduate students and a reference book for industry. The book provides a detailed review of fundamentals necessary to analyze HVAC systems and equipment and then presents a thorough treatment of building loads and primary and secondary heating and cooling equipment that is necessary for design, analysis, and control.



Professor Kai Ming Li joined the Herrick Faculty at the beginning of the 2006-07 academic year.

GEARE Program: A Team Oriented Exchange Program

—Eckhard Groll



Eckhard Groll is not only a Herrick faculty member, he also serves as the Director of Global Initiatives for the Co-operative Education and Professional Experiences in the School of Mechanical Engineering.

Funding was received from the German Ministry for Business and Work to establish a team oriented diploma student/master student exchange program between the mechanical engineering departments at the University of Karlsruhe (Prof. Albert Albers) and Purdue University (Prof. Eckhard Groll). The basic idea of the program is to team up one Karlsruhe diploma student with one Purdue master student for a six-month uninterrupted and course-free research project. The program goal is to have nine students participate from each university per year. The start of the program was the fall of 2005.

Funding was received to support up to six research assistantships (RA) for six months plus travel stipends from each university per year for a total of 3 years (Purdue's portion of the funding is approximately \$80,000 per year for 3 years). After 3 years, it is envisioned that the program will be self-supporting through funding from industry projects that are the basis for the six-month research projects.

The main goals of the graduate Global Engineering Alliance for Research and Education program, known as GEARE, are:

- To develop engineering understanding of the German culture, German language, and Germany as a whole.
- To supporting interactions/meetings between German and U.S. American people, especially young people and future leaders in business and society.
- To provide a forum for the exchange of opinions of current and upcoming engineering topics.
- To support the development of research relationships among faculty.
- To install new initiatives of transatlantic relationships.

Three types of one-on-one student exchange teams were

implemented within the graduate GEARE program:

- A Purdue master's student will study at the University of Karlsruhe for a six-month time period and is teamed up with a local diploma student. The student team is advised by faculty at the University of Karlsruhe. The Purdue student selects the project and partner from a slate of possible projects at the University of Karlsruhe. The travel expenses and six-months of RA support of the Purdue student are provided by the program. The Karlsruhe student is supported by his/her advisor through the research project. The proposed timeline is mid June to mid December. The Karlsruhe student is not supposed to take any classes during the time period.
- At Purdue University, a Karlsruhe diploma student will study for a six-month time period and is teamed up with a local master's student. The student team is advised by faculty at Purdue University. The Karlsruhe student selects the project and partner from a slate of possible projects at Purdue University. The travel expenses and six-months of RA support of the Karlsruhe student are provided by the program. The Purdue student is supported by his/her advisor through the research project. The proposed timeline is August to February. The Purdue student is not supposed to take any classes during the fall semester.



Hector School of Engineering and Management, Karlsruhe, Germany.

- The one-on-one student team is formed in cyber-space. Students conduct their research work at their home universities and communicate through the internet, phone conferences and other electronic media. Students are advised by one or a team of faculty from both universities. Students select the project and partner from a slate of possible projects at either one of the universities. The program provides a travel stipend for the Purdue student to go to Karlsruhe for one week at the beginning of the project to get to know each other. It also provides a travel stipend for the Karlsruhe student to go to Purdue for one week at the end of the project to present the work. If the student team selects to conduct a Purdue project, then the Purdue student continues with his/her “regular” support (e.g., through RA) and the Karlsruhe student is supported through the program. If the student team selects to conduct a Karlsruhe project, then the Karlsruhe students continue with his/her “regular” support and the Purdue student is supported by the program through a six-months RA. The time line to conduct the six-month project is flexible. The Purdue student is not supposed to take any classes during the one semester.

The program started with the academic year 2005/2006 with one Purdue MS student studying at the University of Karlsruhe and two Karlsruhe students studying at Purdue. During the academic year 2006/2007, these numbers increased to three students from each university studying abroad. In addition, the first long-distance team project was started using a regular video conferencing approach. For the academic year 2007/2008, four students from each university will study abroad and two long-distance team projects are planned, resulting in 10 students participating from each university, which exceeds the original goal of nine students each.

The Herrick Laboratories heavily participated in this program during the academic year 2006/2007 by hosting two students from the University of Karlsruhe, while sending two students to Karlsruhe, and having one student conduct the long-distance team project.



Liane Rheinschmitt was a GEARE exchange student from Karlsruhe University from June 2006 to December 2006.

Reflections of a Recent GEARE Student

—*Liane Rheinschmitt*

Together with two other Germans I got a scholarship from my university in Karlsruhe and the chance to come to Purdue for half a year. We all worked in research and wrote our diploma thesis about this. (In Germany we use the last semester of our study exclusively for the thesis.) Claudia Ellmer and I joined the Herrick family. I was working in the voice group with Prof. Luc Mongeau. It was really great to be able to meet so many people with different cultural backgrounds here. This way I could not only gain technical knowledge, but also improve my general knowledge. Picnics and Christmas parties gave me the chance to get to know the students from other research groups and were always a lot of fun. The visit of a football-game was, of course, a must for us. As well as were trips to Chicago. Altogether it was a great experience and I would like to say thank you to everybody, who did support me with my research work as well as with everyday trivia. Hope to see you all again some time.



Interdisciplinary Research

Acoustics at Purdue: It is also happening outside of your lab!

—*Matias Zañartu*

Collaboration among different specialists is absolutely necessary in many research areas in acoustics. Being an Electrical and Computer Engineering student doing my research



Matias Zanartu is a Ph.D. student studying Fluid Structure Interactions in the Human Larynx. His faculty advisors are George Wodika (ECE, BioMed Engr.) and Luc Mongeau (Mech. Eng.)

at Herrick Labs and Biomedical Engineering, I have a sense of what that collaboration means. Everyone should be aware of the options and possibilities that can be explored at Purdue. The Herrick Laboratories is not the only place at Purdue where research in acoustics is done. In fact, there is a large acoustics community at Purdue which has recently come together. This initiative is called PHASE (Purdue Hearing and Acoustics in Science and Engineering). Established last summer with approximately 50 faculty members from across 16 departments (including the Indiana University School of Medicine in Indianapolis), PHASE is currently looking to hire a new professor that will serve as head or director. For more information about PHASE visit the Web site <http://www.purdue.edu/research/phase/>.

The possibilities of interaction between students and faculty members in this community are broad. Because the initiative is still in an early stage, students can play a major role in its development. Students can easily meet people in this community, explore different labs, know what people are doing, and hopefully start collaborating with them. I believe that Herrick Laboratories might have the most students working on acoustics under the same roof at Purdue and being physically next to the new biomedical engineering building means that Herrick acoustics students have even more opportunities to be engaged in collaborative activities.

When we are all busy on our individual projects, we sometimes don't take the time to develop these, ultimately very valuable, relationships with our colleagues. To encourage the students at the Labs to start interacting more closely, and take advantage of the rich pool of knowledge that sur-

rounds us, I have taken on the task of organizing research demonstrations every Friday afternoon at the Laboratories. It is my hope to expand these to include people from other schools such as those that are part of the PHASE community. I believe that by learning about the challenges that other students face in their research and how they address them, we can gain a better understanding of how to tackle problems in our own research.

Herrick Family News

Births

Bryan H. Song (Ph.D., 2001) and his wife, Shin Young, welcomed their second daughter, Olivia Kyu-eun on December 6, 2006.

Zeqiang Sun (MSME, 2001) and his wife, Hongmei, welcomed their second son, David, to the family on March 16, 2007. He weighed 8 pounds 12 ounces and was 21 inches long.



Where Are They Now?

Jason Hugenroth (Ph.D. 2006) is starting a consulting business in Baton Rouge, Louisiana. He says he misses Lafayette, except for the cold weather. But, is enjoying being close to family.

Josephine Lau (MSME 2005) is working on her doctoral degree at the Pennsylvania State University and received an ASHRAE grant-in-aid for her research on "Performance Modeling and Evaluation of In-Duct Ultraviolet Germicidal Irradiation Systems with Variable Operating Conditions."

After the 2006 Winter Commencement ceremony, **Daniel Robinson** visited family in Iowa for a few weeks before moving to Rosslyn, Virginia. He and his wife, Sara, have an apartment across the Potomac and a stone's throw from the National Mall. Daniel accepted a position with Wyle Laboratories in Arlington, Virginia.

Zeqiang Sun (MSME 2001) started working in Chicago about one year ago. His wife, Hongmei, is working at Northwestern University as an assistant professor. They welcomed their second son, David, on March 16. He weighed 8 pounds 12 ounces and was 21 inches long. Everyone is doing well.

Herrick Awards and Promotions

Student Awards

Two graduate students received awards from The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). The awards are designed to encourage students to continue their education in preparation for service in the HVAC&R industry and are given to full-time graduate students of ASHRAE-related technologies.

Ian Bell received an ASHRAE 2006-07 Grant-In-Aid Life Member Club grant given to the highest top rated applicant and supported by a financial contribution from the club for his research on Liquid Flooded Ericsson Cooler with Optimized Compressor and Expander. Ian is working with Eckhard Groll and Jim Braun.

The other ASHRAE award recipient is **Zhao Zhang** for his research on the Modeling of Airflow and Contaminant Transport in Commercial Aircraft Cabins. Zhao is working with Yan Chen. Zhao also received the Bisland Dissertation Fellowship from Mechanical Engineering at Purdue.

The National Highway Institute selected **David Snyder** to receive a 2007 Dwight David Eisenhower Graduate Fellowship. The objective of the fellowship program is to attract qualified students to the field of transportation and research, and advance transportation workforce development.

Faculty Awards

Doug Adams was the 2006 recipient on the Ruth and Joel Spira Award. The Spira Award is designed to recognize a faculty member in the School of Mechanical Engineering who has inspired students and fostered excellence in commercial or defense product realization. The Spira Award in Mechanical Engineering has been in existence for more than 20 years. He also received a certificate of appreciation and the Medal of Achievement from the U.S. Army Stryker Program for developing a spindle diagnostic tool that detects cracks in a military ground vehicle's wheel end.

The Institute of Environmental Sciences and Technology named **Qingyan Chen** the 2007 recipient of the William J. Whitfield Award. The citation reads, "To Qingyan Chen for his significant contributions to the field of contamination control through numerous published papers, studies, and reports." The formal announcement was made as part of the Awards Recognition and Membership Luncheon on May 1 at ESTECH 2007 in Bloomington, Illinois

Our apologies to **Eckhard Groll**. In the last issue we incorrectly stated he was named an ASME fellow. Instead, it was the ASHRAE Board of Directors that elevated him to the grade of Fellow. The presentation was made at the 2007 Winter Meeting in Dallas, Texas during the Plenary Session on Saturday, January 27.

Doug Adams and **Eckhard Groll** were named University Faculty Scholars. This honor is conferred on outstanding faculty members at the West Lafayette campus who are on an accelerated path for academic distinction. Eligible faculty must hold the rank of tenured associate or full professor and have been in that rank for no more than five years. New hires appointed with tenure are also eligible. Doug and Eckhard join a very distinguished group of faculty from Mechanical Engineering and across Purdue who have been recognized in this way. Past honorees are listed at <http://www.purdue.edu/provost/shtml/profs.shtml#faculty>.

Bin Yao was honored by Zhejiang University as one of the Overseas Academic Backbones for the Programme of Introducing Talents of Discipline to Universities on Information and Control Science. The Programme of Introducing Talents of Discipline to Universities was initiated and jointly funded by the Ministry of Education and the Department of Foreign Experts of China in 2006, with the intention of bringing in world leading researchers into top elite Chinese universities to promote the development of specific academic fields of national importance (<http://www.moe.edu.cn/edoas/website18/level3.jsp?tablename=1239&infoid=24046>). The Information and Control Science of Zhejiang University was one of the few awarded disciplines in 2007. Prior to this, Dr. Yao was also honored by Zhejiang University as one of the eight individuals to be named "Kuang-piu" Professors in 2005 for his collaboration with the State Key Lab of Fluid Power Transmission and Control in the Institute of Mechatronic Control Engineering. He received a Joint Research Fund for Overseas Chinese Young Scholars from the National Natural Science Foundation of China (NSFC) in 2006. The fund is a prestigious award given by NSFC to sponsor outstanding scholars under the age of 45 who are doing research abroad to carry out basic research and applied basic research in China for a certain period of time every year (http://www.nsf.gov.cn/e_nsf/2004/02gp/07ftp/001.htm).

Faculty Promotions

At the Purdue University's Board of Trustees meeting on Friday, April 13, **Galen King**, **Kai Ming Li** and **Bin Yao** were promoted from Associate Professor to Full Professor.



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Contracts and Grants Awarded

Due to a transition to a new accounting system at Purdue, contract and grant information is unavailable at this time. When it becomes available, it will be included in the newsletter.

News About You and Address Changes

We are always interested in hearing your news, and we want to be kept up-to-date on current addresses. Please send notes to Judy Hanks or to the e-mail address below. Don't hesitate to let us know of other alums who have moved. Photos are always welcome.

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