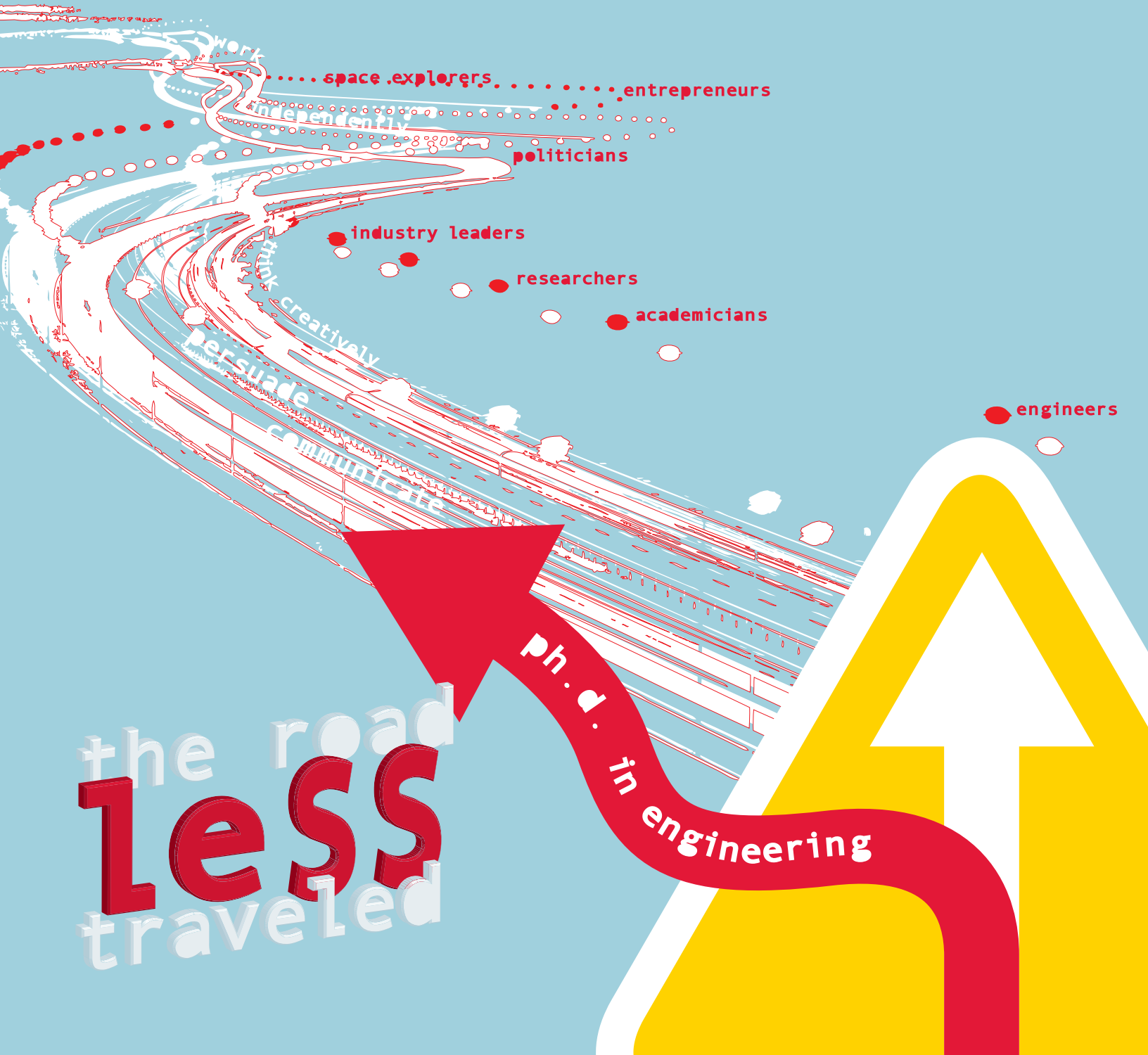


University of Houston Cullen College of Engineering

[Parameters]

Spring 2008

inspiring students
educating engineers
consulting for industry
serving the community
developing energy technology
building cleaner engines
exploring space



work
..... space explorers entrepreneurs
independently

politicians

industry leaders

researchers

academicians

engineers

think creatively
persuade
communicate

ph.d. in engineering

the road
Less
traveled



As the University of Houston begins redefining itself under the dynamic leadership of President Renu Khator, one thing is certain—the Cullen College of Engineering will play a crucial role in expanding the academic and research enterprise at UH as it aspires to become a top tier research institution. And, it is with great pleasure that I have the opportunity to be involved in this major endeavor as your new dean of engineering.

In stride with the university's research cluster initiative, the college has developed four core areas of research focus: energy, biomedical engineering, nanomaterials and complex systems. These are significant areas of national interest and societal need, and are critical to the infrastructure throughout the Greater Houston region. Our research expertise in these areas is strong and our location affords us an incredible opportunity to have a widespread impact on matters of global importance, such as the future of energy and medicine.

In the coming months, we will be redeveloping and reorganizing the college's strategic plan, which will include major campaigns to expand the number of faculty and increase the college's annual research expenditures. We anticipate unprecedented growth in our academic and research programs over the next five years in an effort to become more competitive with some of the leading programs in the country. We will also be making an aggressive push to recruit more undergraduate and graduate students, both nationally and internationally. Encouraging more students to pursue degrees in engineering, particularly advanced degrees, is critical if our nation is to remain technologically competitive in the global economy.

In this issue of *Parameters*, we share some of the stories of our Ph.D. graduates, their motivations for pursuing their doctoral degrees and how they are using that degree to impact the world. Many of these individuals are actively advancing research in the areas of energy, space exploration and the environment, while others are leaders in education and in the community. We are very proud of all of their accomplishments and would like to hear more success stories from our alumni community.

We are looking forward to working with you—our alumni and friends—as well as the Greater Houston community, to provide a strong, competitive engineering program to serve the needs of this rapidly developing regional workforce. Your support will be essential as we prepare to take this major step forward—a defining moment in the history of our college.

Thank you for your support and enthusiasm for the UH Cullen College of Engineering.

Sincerely,

Joseph W. Tedesco, Ph.D., P.E.
Elizabeth D. Rockwell Endowed Chair and Dean



THE ROAD LESS TRAVELED

The Road Less Traveled is the expanded educational journey that leads to a Ph.D. degree in engineering. Doctoral programs not only offer advanced degrees for students, but give them the opportunity to learn how to communicate, think creatively and work on a team, as well as independently. All of these valuable skills have motivated many UH Cullen College of Engineering alumni to pursue a Ph.D. degree and have proven to be essential in their chosen career paths.

Parameters is published biannually by the University of Houston Cullen College of Engineering, Office of Communications.

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4 College News Briefs

8 **THE ROAD LESS TRAVELED**

The UH Cullen College of Engineering has granted nearly 1,000 Ph.D. degrees since the launch of its doctoral program 50 years ago. Compared with the number of undergraduate and even master's degrees awarded annually, the path to the Ph.D. degree is unquestionably the road less traveled for many college students. For UH alumni, their motivations for pursuing their doctorate differ as much as their evolving career paths.

- [10] **INSPIRING STUDENTS**—Bonnie Dunbar (1983 PhD BioE)
- [12] **BUILDING CLEANER ENGINES**—Feng Zhang (2005 PhD ME)
- [13] **EDUCATING ENGINEERS**—Victor Zaloom (1970 PhD IE)
- [14] **EXPLORING SPACE**—Patrick Fink (2002 PhD EE)
- [15] **DEVELOPING ENERGY TECHNOLOGY**—Xiuli Wang (2000 PhD ChE)
- [16] **SERVING THE COMMUNITY**—Daniel Wong (1983 BSCE, 1985 MSCE, 1988 PhD CE)
- [17] **CONSULTING FOR INDUSTRY**—Ven Pinjala (1981 MSChE, 1985 PhD ChE)

18 **DONOR PROFILE—LARRY AND GERRI SNIDER MOVED TO GIVE**

Motivated by their faith and a sense of gratitude to UH, Larry Snider (1955 BSIE) and his wife Gerri have provided tremendous support to the UH Cullen College of Engineering because of the opportunities his education afforded them.

22 Donor Roll Call

24 **FACULTY RESEARCH SHOWCASED—HANADI RIFAI THE QUEST FOR CLEAN WATER**

One of the challenges for major cities is limiting the amount of pollutants that enter bodies of water. Professor Hanadi Rifai's research involves the creation of sophisticated models of watersheds to help determine how much pollution is in a body of water and where that pollution is coming from.

28 **ALUMNI PROFILE—JESSE GONZALEZ FROM LEGACY TO LEADERSHIP**

Jesse Gonzalez (1969 BSCE) began his career with SpawGlass as a laborer and has risen to chairman of the \$400 million-a-year company.

30 **ALUMNI PROFILE—CHARLES BEYER THE ROAD TO SUCCESS**

Charles Beyer (1972 BSCE, 1977 MSCE) recently celebrated the 25th anniversary of Beyer Construction and the completion of 1,000 projects. He paves the way for current and future students by sponsoring an annual UH civil engineering networking luncheon.

32 Class Notes

34 **LAST WORD**

A ROCKET ROAD TO EDUCATION

*UH Professor Emeritus John Lienhard offers a perspective on the pathway to education via a past episode of his daily National Public Radio program, *The Engines of Our Ingenuity*.*

36 Calendar

pa-ram-e-ter
Pronunciation: pə-'rām-ə-tər
Function: noun
Etymology: New Latin, from para- + Greek metron measure
Date: 1656

1: *a.* an arbitrary constant whose value characterizes a member of a system (as a family of curves); also: a quantity (as a mean or variance) that describes a statistical population
b. an independent variable used to express the coordinates of a variable point and functions of them — compare PARAMETRIC EQUATION

2: any of a set of physical properties whose values determine the characteristics or behavior of something -parameters of the atmosphere such as temperature, pressure and density->

3: something represented by a parameter: a characteristic element; broadly: CHARACTERISTIC, ELEMENT, FACTOR
<political dissent as a parameter of modern life->

4: LIMIT, BOUNDARY — usually used in plural
<the parameters of science fiction->

The University of Houston provides equal treatment and opportunity to all persons without regard to race, color, religion, national origin, sex, age, disability, veteran status or sexual orientation except where such distinction is required by law. This statement reflects compliance with Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Educational Amendments of 1972, the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990, and all other federal and state regulations. The University of Houston is the doctoral degree-granting and largest university of the University of Houston System, a public system of higher education that includes three other universities: UH-Clear Lake, UH-Downtown and UH-Victoria.

College Wins \$8.8 Million Grant for Diesel Vehicle Emissions Testing

Funds will expand testing capabilities and speed technology development



The Diesel Vehicle Research and Testing Facility at the University of Houston Cullen College of Engineering has won an \$8.8 million state grant from the Texas Commission on Environmental Quality (TCEQ) to speed the development of emissions-reduction technologies for diesel vehicles and equipment. An additional \$1.5 million in TCEQ funding may be awarded to UH in order to conduct selected testing, technology screening and R&D studies. These technologies will be designed to help the state's metropolitan areas cut pollution levels mandated by the Environmental Protection Agency (EPA).

The TCEQ grant was made possible by a new state law championed by State Senator Kip Averitt and State Representative Dennis Bonnen, among others.

"This grant award affirms the University of Houston's leadership role in the research, development and testing of new technologies in the important area of nitrogen oxide and particulates reduction for heavy duty diesel vehicles," said Charles Rooks, co-principal investigator and

director of the facility. "Through its partnerships with the City of Houston, the State of Texas, and the private sector, our efforts will contribute to the achievement of the air quality goals of the Greater Houston area and other non-attainment cities across the state. Additionally, it will expand the invaluable research opportunities for Cullen College of Engineering graduate students."

The Diesel Testing Facility, which will be renamed the Texas Diesel Testing and Research Center, was established in 2002 with a \$3.8 million grant from the City of Houston to evaluate technologies that reduce emissions from

diesel vehicles owned by the city, such as garbage trucks and road repair vehicles. The facility has particularly focused on technologies that reduce the emissions of nitrogen oxides (NOx) from these vehicles. NOx reacts photochemically with volatile organic hydrocarbons in the atmosphere to form ozone, a respiratory irritant that can cause permanent lung damage and is particularly harmful to young children and the elderly. The laboratory also measures other pollutants like particulate soot, hydrocarbons and carbon monoxide.

"The Greater Houston and Dallas-Fort Worth areas have been designated ozone non-attainment areas by the EPA," said Mike Harold (1985 PhD ChE), professor and chair of chemical and biomolecular engineering and co-principal investigator for the project. "These areas must reduce ozone levels or face cuts in the amount of federal highway funding they receive. To do this requires significant reductions in NOx emissions from stationary and mobile on-road and off-road sources. Emissions from the mobile sources are especially challenging to reduce given the diversity and number of these sources. This project, therefore, is critical to the state."

For the City of Houston, the facility and its researchers primarily test retrofit solutions that could be added to existing vehicles to reduce NOx emissions. According to Harold, the center has identified some promising solutions for the city, as well as test findings that indicate certain technologies offered no benefit and would therefore be unwise investments of taxpayers' money.

This new grant will make such testing available to municipalities throughout the state. In addition, it will enable smaller companies that have received research funds from the Texas Environmental Research Consortium (TERC), an organization affiliated with TCEQ, to test their own emissions-reduction technologies.

"By investing in our facility, the state is enabling companies to test their ideas in a state-of-the-art laboratory that emulates the kind of venue they would need to pass through to get their technologies verified by the EPA," said Harold.

With the state funding, the facility will upgrade existing equipment and purchase new equipment that will enable it to offer a wider variety of tests. Most of the funding for the facility will be used to install a heavy-duty engine dynamometer and an array of analytical devices. This system will be used to test emissions-reduction tools on stand-alone engines detached from vehicles. According to Harold, for a technology to be verified by EPA-approved procedures, an engine dynamometer is needed. He said that the laboratory will likely become an EPA-recognized lab to provide such verification testing.

Another major piece of equipment that will be purchased for the facility is a portable emissions testing system, which can be attached to vehicles or off-road equipment during their normal operation. That data can be merged with information garnered through a global positioning system, for example, to provide a real-world picture of NOx emissions and their connection to vehicle usage.



The third major investment made possible by the grant will go toward the design and construction of a unique bench-scale system for emissions testing. This system will be used to develop and test new concepts in emissions-reduction technology and reduced-scale prototypes of products based on these concepts. This tool will be used not only by companies funded by TERC, but also by Cullen College graduate students and faculty members conducting fundamental research on NOx and other harmful emissions. It also provides a test-bed to evaluate technologies being developed by UH researchers. For example, Harold collaborates with Professor Vemuri Balakotaiah in a project sponsored by the U.S. Department of Energy that is focused on the so-called "lean NOx trap," an advanced catalytic converter suitable for diesel and lean-burn gasoline vehicles. Clean engine and emissions-related research supported by the National Science Foundation is also being carried out by Professor Dan Luss of chemical and biomolecular engineering, and Professors Matt Francheck and Karolos Grigoriadis of mechanical engineering.

The portable unit and bench-scale system should be running by mid-2008, while the engine dynamometer should be installed and operational in March 2009, he added.

"Most large vehicle and engine companies have these kinds of facilities in-house," Harold said. "This grant provides facilities for third-parties to accelerate the development of technology that is critical for the region and the state. It also is an excellent test-bed for faculty experts to conduct basic and applied research in the areas of new fuels, fuel additives, engine diagnostics and controls and catalytic aftertreatment devices."

College Programs Meet Evolving Workforce Demands

The UH Cullen College of Engineering is implementing several educational programs and initiatives designed to keep pace with the changing demands on the region's and nation's engineering workforce.

Online Courses for Aerospace Program

The college is a co-recipient of a \$1.4 million grant to offer cutting-edge educational resources to current and aspiring aerospace engineers. Foremost among these is a series of online courses to be offered to professionals in the aerospace workforce.

According to Karolos Grigoriadis, director of the aerospace engineering graduate program at UH and principal investigator for UH's portion of the grant, these courses will provide individuals in the aerospace workforce with a convenient way to pursue advanced degrees and to keep their knowledge of the field current.

"Though NASA will retire the shuttle program in a few years, there is a new vision for space exploration beyond 2010 that involves going back to the moon and a space mission to Mars," he said. "There is a need to retrain the existing aerospace workforce to produce individuals with advanced degrees and to educate young engineers who will pursue careers in the aerospace industry."



Interdisciplinary Curricula

Another recent educational development at the Cullen College is the creation of an interdisciplinary curriculum available to mechanical engineering graduate students who are conducting engine and/or controller research. The interdisciplinary curriculum includes a strong chemical engineering component, giving these students a knowledge base in areas that directly impact their own fields of expertise according to Grigoriadis, who has been involved in the creation of this curriculum. These fields intersect with the chemical engineering disciplines of catalysis and reaction engineering, which play a key role in emissions reduction, engine efficiency and other areas.

"This approach has been praised and promoted by automotive companies, who have been very supportive of this combined effort, not only in terms of research, but in terms of education," he said. "They want to see our students exposed to the chemical side of things so they can communicate with chemical engineers who are working on the chemistry of engine exhaust."

Master's Degree in Business Engineering

For professional engineers interested in moving beyond purely technical positions into leadership roles, the college is launching a new Master of Business Engineering program.

The program, whose tagline is "Managing Innovation," is designed to equip working engineers with business and management-related skills. With classes taught by industry leaders, the program will cover topics such as project management and the process of shepherding a technical innovation from conception to implementation. For more information, visit www.mbe.uh.edu.

EAA Makes an EWeek "World of Difference" to Students

As part of National Engineers Week, the UH Engineering Alumni Association (EAA) celebrated how engineers "make a world of difference" at their annual EWeek reception and program on Feb. 19 by presenting cash awards to engineering students and student organizations, as well as acknowledging generous corporate supporters.

"We are so fortunate to have the support of local engineering companies and organizations," said Cynthia Oliver-Coleman (1971 BSChE), chair of EAA's EWeek event. "Their support continues to provide numerous cash awards to engineering students to help pay for the rising cost of education. Each year, more and more students benefit from their generous support."

Forty-three students and two student organizations were awarded nearly \$29,000 during the event, which attracted some 220 engineering alumni, faculty, staff, students and sponsors. Among the many sponsors were the UH Petroleum Engineering Advisory Board, FMC Technologies, BP Alternative Energy, ExxonMobil Women Engineer UH Alumni, Shell Oil Company, Bechtel, Fluor Corporation, Malcolm Pirnie, Inc., UH Engineering Alumni Association, Baker Hughes, Bayer Technology Services, INTEC Engineering, Kalsi Engineering, Inc., Marathon Oil Company, Reliant Energy, Society of Women Engineers-Houston, TCB, Inc. and Traffic Engineers, Inc.



On behalf of FMC Technologies, Chris Waskow (right) presents the Engineering Community Outreach Competition's first place award to PROMES Action Committee President Vinita Kapoor, industrial engineering senior. The \$1,000 award sponsored by FMC Technologies will provide operational support for the organization.

Homecoming 2007



(Top) UH engineering students (from left) Larissa da Costa, Ashleigh Williams and Roel Huerta, along with friends Tally Perez and Brett Maginness, volunteer at the Engineering Alumni Association (EAA) tailgate party during the 2007 Homecoming festivities.

(Top Right) Tom Sofka (1975 BSCE), past president of EAA, performs a Blues Brothers routine for Homecoming crowds with pal Dave Howell-DePew, owner of Third Coast Comedy in Houston.

(Bottom Right) Dean Joseph Tedesco and his wife Susan traveled to Houston to celebrate UH Homecoming last November before he officially began his appointment in January. They participated in the EAA auction and won a pair of Houston Rockets tickets.



the road **LeSS** traveled

Just fifty years ago, while in a heated competition with the Soviet Union following the country's launch of Sputnik in 1957, the United States began a major push in science and technology research. The entire movement, known as the Space Race, had a profound impact on graduate programs nationwide, including many at the University of Houston. After educating doctoral candidates for a half century, the UH Cullen College of Engineering will grant its 1,000th doctoral degree this year.

While an impressive milestone, that number is dwarfed by the approximately 1.5 million bachelor's degrees that will be conferred in the U.S. during the 2007–2008 academic year alone, according to the National Center for Education Statistics. Less than three percent of students enrolled this year will be working toward a doctoral degree, making the path to the Ph.D., unquestionably, the road less traveled. The time, commitment and energy required to earn the degree—as well as the opportunities one must forego during the process—prevent many smart, hard working people from ever giving it serious consideration.

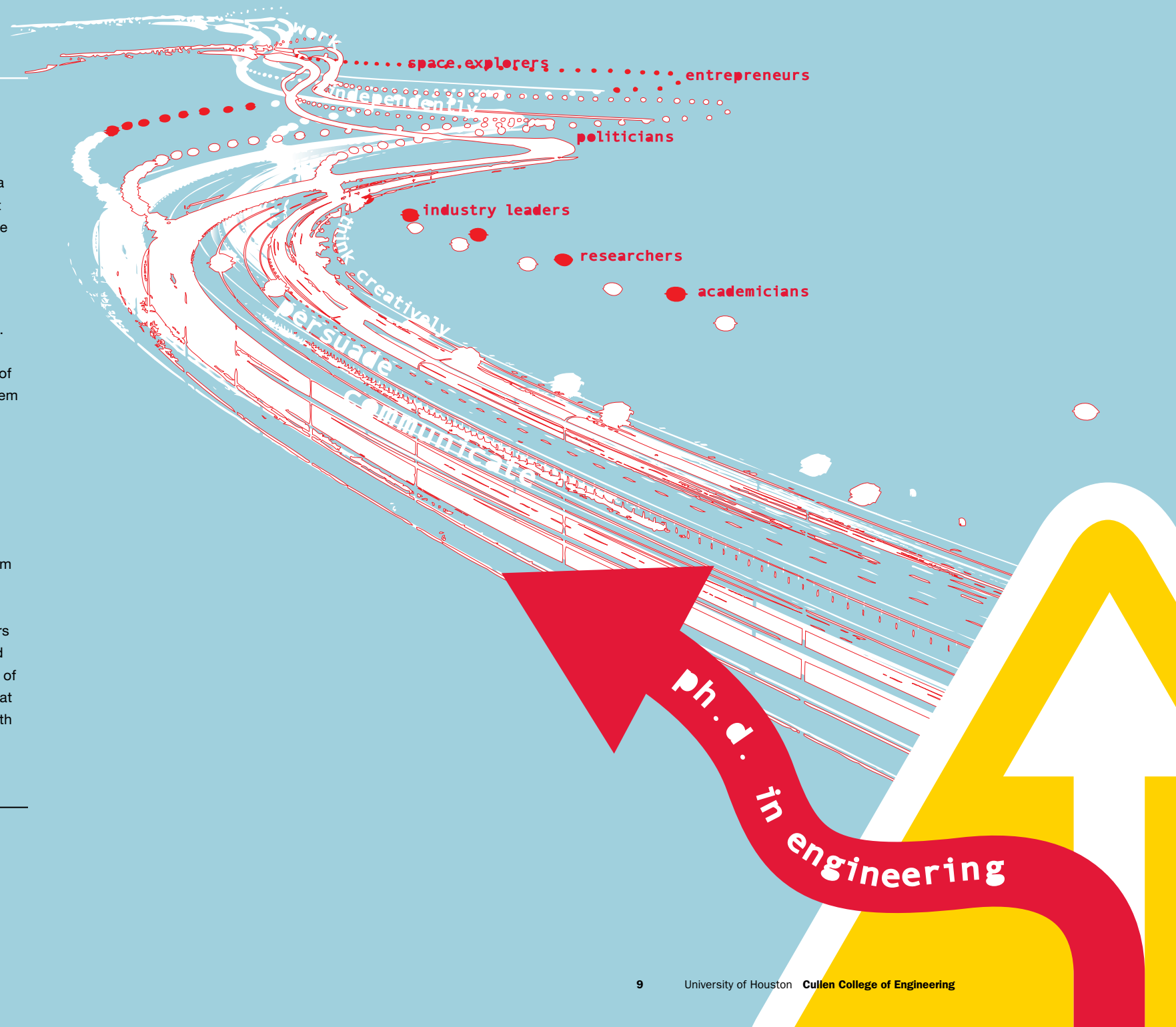
The demand for professional engineers is so high that lucrative job offers are being extended to undergraduate engineering

students—often \$70,000 a year or more—long before graduation.

So what would compel someone to pursue a doctorate in engineering? What's the benefit of spending an extra half-decade of one's life earning a degree that demands so much of those who pursue it?

The exact motivations behind pursuing a Ph.D. vary from person to person, of course. A common refrain among those who have earned a doctorate from the Cullen College of Engineering is that the process equipped them with important skills outside of the technical realm, such as the ability to communicate, persuade, think creatively, and work independently, as well as part of a team.

These skills have served Cullen College of Engineering alumni well. Some of the individuals who have earned a doctorate from the college play a role in space exploration. Others have gone on to successful careers as entrepreneurs, politicians, industry leaders and, of course, academicians, scientists and researchers. What follows is just a sampling of these alumni, demonstrating conclusively that while the path to the Ph.D. is a long one, both the destination and points beyond make the journey's time and effort well spent. ▶▶



Features by Toby Weber and Lindsay Lewis

For many profiled in this feature, a Ph.D. was a necessary ingredient in their success. The degree—and the knowledge and skills they accrued while earning it—gave them opportunities they otherwise might not have had.

Inspiring students

Bonnie Dunbar

President and CEO, Seattle Museum of Flight



Bonnie Dunbar
Ph.D. Biomedical Engineering

PHOTO BY MARIAN LOCHART

Bonnie Dunbar (1983 PhD BioE), a retired astronaut with five space shuttle missions to her name and current president and CEO of the Seattle Museum of Flight, is a prime example of this.

When Dunbar was selected as a NASA astronaut, it was the fulfillment of a lifelong goal. As a child growing up in rural Washington, she had dreamed of traveling to space.

She made many of her educational choices with that goal in mind, earning her B.S. and M.S. in ceramics engineering from the University of Washington. After accepting a job as a member of mission control in Houston, she enrolled in the Cullen College's biomechanical engineering program in 1978, where she continued to focus on ceramics—specifically, on human bones.

"There are a lot of ceramics around us that we're not aware of. The silicone in computer chips, the bones in our body, some calcium carbonate in our inner ear... I was very interested in the strength of bones, particularly as osteoporosis might be caused by space flight as a result of being weightless for long periods of time," she said. Dunbar's doctoral dissertation, therefore, involved evaluating the effects of simulated space flight on bone strength and fracture toughness.

This field of engineering expertise made Dunbar a natural fit for many of the experiments astronauts conduct and issues they face. The fact that she was pursuing her doctorate played an important role in her selection as an astronaut.

"I think it was very significant at the time," she said. "I was coming in as a mission specialist [in the astronaut class of 1980]. All the mission specialists that had been selected in the 1978 class had Ph.D.s... I hadn't finished it, but I made the commitment to them that I would finish my dissertation."



PHOTO COURTESY OF THE SEATTLE MUSEUM OF FLIGHT

Dunbar did of course complete her dissertation, earning her Ph.D. from UH in 1983. Two years later, she went on the first of five shuttle flights she would participate in over the next 13 years.

On some of these missions, Dunbar helped carry out experiments and, in fact, served as the subject of experiments involving the impact of weightlessness on bones. "With my biomechanical background, I had a fairly good understanding of why the research was being done," she said.

In 2005, Dunbar left the space agency to take up her current post as leader of the Seattle Museum of Flight. The museum is one of the largest and most highly regarded air and space museums in the country, if not the world.

The opportunity to lead the museum came at the right time for her, Dunbar said. She had put in 27 years at NASA and was drawn to the museum's quality and to the thought of returning to her native Washington.

As the Museum of Flight's leader, Dunbar oversees all aspects of the institution's operations, a job she compares to running a small business. This task includes managing a staff of more than 180 individuals and a volunteer base of more than 1,000.

In addition to her management duties, Dunbar spends a significant portion of her time conducting outreach for

the museum—some for fundraising and some for more basic community relations.

Since Dunbar took over leadership of the museum, it has achieved notable successes. Foremost among these was the museum's designation as an affiliate of the Smithsonian Institute in 2007. The recognition allows the Museum of Flight to access the more than 136 million objects housed by the Smithsonian, as well as incorporate these objects into its own exhibits.

What most drew Dunbar to the Museum of Flight, though, is its commitment to education. The mission of the museum, she said, "is to be the foremost educational air and space museum in the world." The museum has extensive educational programs designed for students from kindergarten through college. Developing and promoting these programs, Dunbar stated, offers her an opportunity to contribute in a meaningful way to the society that allowed her to succeed as she has.

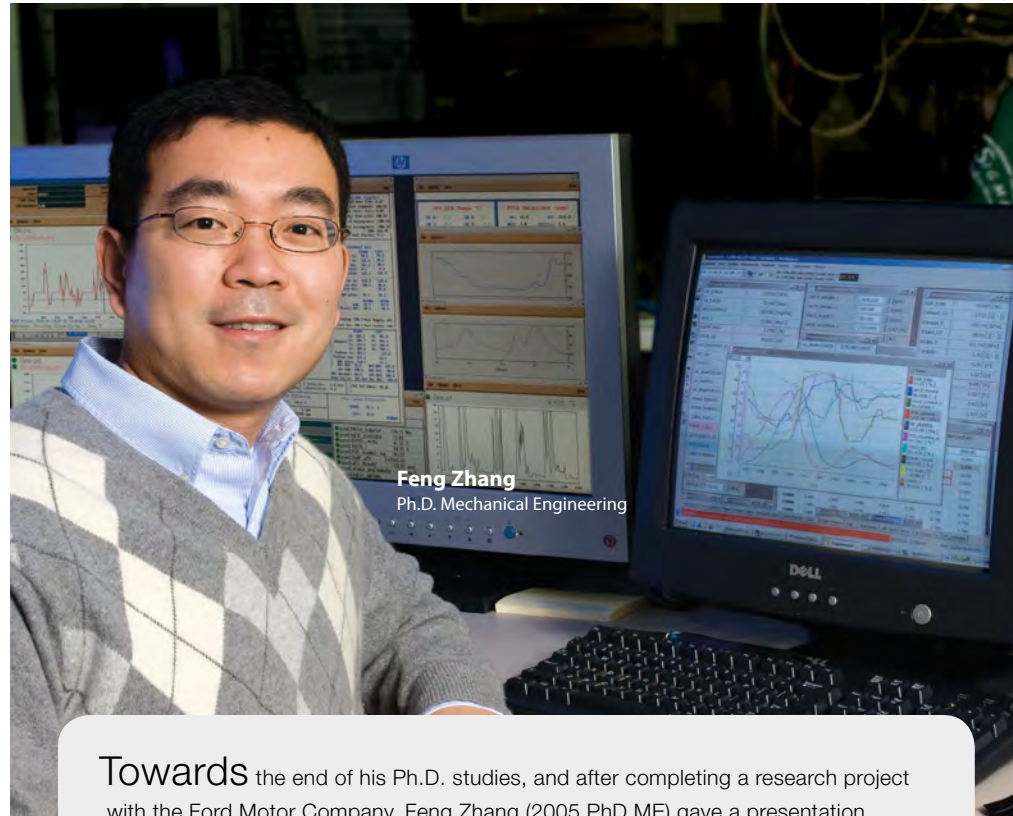
"It was the value system of my parents and teachers, along with my education and my ability to learn, that allowed me to achieve everything I have achieved," she said. "This is a wonderful opportunity for me to educate the general public about the history of air and space and to do the same for our youth, whom I think don't always value or understand the role of taking risks, of entrepreneurship or the role that math and science play in their lives." @

building cleaner engines

Feng Zhang

Research Engineer, Ford Motor Company

PHOTO BY SAM VARNHAGEN



Feng Zhang
Ph.D. Mechanical Engineering

Towards the end of his Ph.D. studies, and after completing a research project with the Ford Motor Company, Feng Zhang (2005 PhD ME) gave a presentation on his work to some of Ford's top researchers. One of the company's most senior researchers pulled Zhang aside afterwards and had him interview for a job within the hour. After a follow-up interview a few weeks later, Zhang was offered a position at Ford, even though the company was going through a period of belt tightening at the time. "I was the only new hire in the department during that year," he said.

Zhang, now a research engineer with the company's diesel diagnostics and controls group, was hired partly because he embodies two trends in engineering education—the move toward interdisciplinary approaches to engineering challenges and the establishment of strong partnerships with industry to develop new technologies and educate new engineers.

Just three short years ago, Zhang completed his doctoral studies in mechanical engineering at the University of Houston Cullen College of Engineering, with a focus on dynamic systems and controls. His early research involved controllers for aerospace applications, but his interests later shifted to internal combustion engines.

While these are commonly researched fields among mechanical engineers, Zhang, along with his advisor, Karolos Grigoriadis, professor of mechanical engineering, constructed a curriculum that gave him a solid understanding of the issues he was tackling not just from a mechanical engineering perspective, but from the perspectives of electrical and chemical engineering. Both disciplines are applied in the design of sensors, actuators and catalysts used in controllers and in the systems with which they work.

"Every control device involves electrical engineering. The catalyst is a chemical device, so the dynamics are chemical. If you don't understand how the device operates, you can't control it," he said.

The combination of courses and readings that Zhang assembled for himself proved so successful that the college is now offering a formal curriculum for mechanical engineering graduate studies that includes a strong chemical engineering component.

This holistic approach to control systems was complimented by Zhang's research project with Ford, as well as with an internship with Cummins Diesel. By working with these companies, Zhang said, he gained a better understanding of how to devise solutions that worked not only in the theoretical realm, but also in the practical world of business, with its demands for reproducibility and cost-effectiveness. He puts these skills to use daily with Ford, where he is one of the individuals charged with creating controllers that significantly reduce the emissions of the company's heavy-duty trucks, without sacrificing performance.

"My internship and research project definitely changed the way I thought of the problems I was addressing, and even the way I wrote my dissertation. It gave me a more practical view," he said. ☺

Victor Zaloom

Associate Dean of Engineering, Lamar University

After serving over 35 years in higher education, it is hard to believe Victor Zaloom (1970 PhD IE), UH industrial engineering's first Ph.D. graduate, did not intend to pursue graduate studies when he entered college in the early 1960s.

As a University of Florida freshman interested in engineering, Zaloom pursued industrial engineering with every intention of entering industry after graduation. With the opportunity to complete a master's degree with one additional year of study, he completed the program and took a job at what is now Lockheed Martin.

"I was very fortunate to have an older brother as a role model who put an emphasis on graduate work," he said. "My experience led me into the world of industry, where I was able to gain insight into business. It opened up a new world to me."

Zaloom worked in an economics group that produced statistical forecasting for the future production of military aircraft and space exploration systems. The group provided cost analyses and models in order for the company to compete for project bids.

But it was during this time that a chance phone call, and the resulting experience, altered his career path.

"Out of the blue, I was called to teach an engineering economics course," he said. "While teaching, I realized this is what I wanted to do with my career."

Although offered to instruct more courses, Zaloom decided to pursue a Ph.D. to gain the credentials needed for a tenure-track academic position. He was accepted into the industrial engineering programs at Texas A&M University and the University of Houston. He came to Houston to study because his interview with then-department chair Scott Poage was a positive experience. "Scott made me feel comfortable and welcomed. That's the main reason I decided to study at UH," he adds.

His academic career led him to Auburn University for nearly a decade, then to North Carolina A&T State University, where he was challenged to have a new program in industrial engineering accredited in three years—which he did. However, it was his familiarity with the southeast Texas region that drew him to Lamar University in Beaumont, where he has served as chair of the Department of Industrial Engineering since 1981 and associate dean of engineering since 2006.

And though his academic career has been primarily administrative, his long-standing research in the areas of risk analysis, modeling and scheduling contributed to a three-year appointment to the National Maritime Security Advisory Committee in 2004 to assist the Department of Homeland Security in improving port security.

"Overall, my career in academia has been a very rewarding experience," he said. "I am satisfied each time a former student contacts me to share how they are impacting the world." ☺



Victor Zaloom
Ph.D. Industrial Engineering

PHOTO BY MARK LACY

Patrick Fink

Deputy Chief, Electromagnetic Systems Branch, NASA

As a child, Patrick Fink (2002 PhD EE) dreamed of working for NASA. The technology that put people on the moon and into orbit, he said, fascinated him. As he pursued his education and later his career, that love for science still drove him, to the point that it was the primary motivation in his pursuit of his doctorate in electrical engineering from UH.

"I really wanted to learn more about electromagnetics. I wanted to know as much as the people on the leading edge," he said.



Patrick Fink
Ph.D. Electrical Engineering

PHOTO BY MARK LACY

Now, Fink puts that knowledge to use, while at the same time fulfilling his childhood dream, as deputy chief for NASA's Electromagnetic Systems Branch within the Avionic Systems Division. Fink and his colleagues are charged with a variety of tasks surrounding electromagnetics and communications. Their typical projects include developing and evaluating new technologies, such as fabric-based antennas and passive, wireless sensors; evaluating wireless technologies such as RFID for application in a lunar habitat; creating antenna arrays for use on the International Space Station; and numerically modeling the electromagnetic fields around space vehicles in order to find, for instance, electromagnetic dead zones—areas outside the vehicles where astronauts on spacewalks would not be able to communicate with those inside.

This work has his team involved in some of NASA's highest profile projects, including electromagnetic modeling for the Orion Crew Exploration Vehicle, the planned successor to the Space Shuttle Program. Such efforts are rewarding, Fink said, because they have a clear and significant impact.

"When I first started at NASA, I expected to see clean rooms everywhere with dozens of scientists overseeing every project," recalled Fink. "But what continues to amaze me over the years is the amount of difference a small group of people can make. There's so much unknown in so many of the areas that we work in."

Since much of the group's work is directed toward specific goals, Fink conducts only a limited amount of basic research at NASA. He makes up for this outside of the office, however, through an act that demonstrates his zeal for his chosen field.

"Some of the more basic computational research that our group does, we do in our spare time at home," he said. "It's sort of a hobby, and we can apply it to our work here." ©

Xiuli Wang

Vice President of Technology, XGAS



Xiuli Wang
Ph.D. Chemical Engineering

PHOTO BY MARK LACY

Xiuli Wang (2000 PhD ChE), vice president of technology for start-up company XGAS, didn't have to pursue a Ph.D. in chemical engineering. When she decided to come to the University of Houston in 1995, she had already earned her master's degree in the field from one of China's most prestigious universities; had a career with Sinopec, one of the country's largest petroleum companies; and was respected enough to hold teaching positions at the university level.

But Wang decided to leave her home country to earn her doctorate anyway—for professional reasons and out of a sense of curiosity. At the time, she said, the best path for young people in China to advance their careers took them outside of the country, and the American graduate education system intrigued her. "I wanted to get an education in the U.S. and find out how it was different from what was available in China," she said.

As Wang sees it, the distinguishing qualities of American graduate education are also its strengths. At that time in China, graduate-level engineering studies were very narrow in scope, focused primarily on technical skills, and almost all learning took place in the classroom.

Technical skills, of course, are imparted at the UH Cullen College of Engineering and other U.S. institutions. In the U.S., however, graduate students learn many of the "soft skills" necessary to succeed, such as the abilities to work within a group and to communicate effectively. Just as importantly, Wang learned how to solve problems that one encounters at the highest levels of her discipline while pursuing her Ph.D.

These skills have served her well throughout her career. In her previous position with BP, Wang worked on multiple projects involving several different aspects of both the upstream and downstream areas of petroleum engineering. In her current position with XGAS, which she took only a few months ago, she oversees the engineering aspects of the company's efforts to use compressed natural gas to bring to market stranded natural gas—gas that has been discovered but remains unused due to economic or physical reasons.

Wang's work has earned the respect of her fellow engineers. She was named an Asian American Engineer of the Year by the Chinese Institute of Engineers for 2007 and was a participant in the Society of Women Engineers' 2007 online Global Marathon, which was designed to encourage young women to enter engineering fields.

"I feel fulfilled," Wang said. "I'm a Chinese-American woman engineer and I like to prove that I can deliver just as much if not more than others." ©

Daniel Wong

CEO, Tolunay-Wong Engineers
Councilman, City of Sugar Land



Daniel Wong
Ph.D. Civil Engineering

The obvious benefit of pursuing and earning a graduate degree in engineering is that it expands one's knowledge of the subject itself. For many, a less obvious—but just as potent—benefit is how earning a graduate degree forces them to expand as individuals, building a repertoire of skills that serve them well in any number of areas.

Daniel Wong (1983 BSCE, 1985 MSCE, 1988 PhD CE) is just such an individual. As CEO of Tolunay-Wong Engineers and a member of the Sugar Land City Council, Wong credits much of his success in both business and politics to the actual process of earning his graduate degrees.

Wong's research for his master's degree involved the construction and operation of a device used to study methods of pile driving—forcing a column into soil or sand—for construction purposes. This research required that he work with fellow graduate students, outside vendors and other parties to build and operate machinery. In doing so, he was forced to improve his verbal and written skills, as well as to learn the finer points of teamwork and personal persuasion—skills that have served him well in business and in the public sector.

“If I was trained just with a traditional engineering curriculum—staying in the office, doing computer modeling—I wouldn't really be able to work effectively with the outside world. Graduate school opened me up to the outside realm,” Wong said.

Indeed, in 1993, just a few years after earning his doctorate, Wong co-founded Tolunay-Wong Engineers, Inc. The firm, which now employs approximately 165 people, specializes in providing foundation recommendations for projects large and small. The company's notable projects include Houston's Sam Houston Tollway and the upcoming \$6 billion expansion of the Motiva refinery in Port Arthur, Texas.

In 2002, at the encouragement of friends and colleagues, Wong ran for and won a seat on the Sugar Land City Council. He is also a member of the Texas Board of Professional Engineers, and is a board member of the Houston-Galveston Area Council, where he partners with political and community leaders from across the region to solve common problems.

Wong, who in graduate school learned how to communicate, work with a team and persuade, now finds himself an advocate for cooperation and coordinated efforts on a much larger scale.

“I'm an engineer, so my focus is on mobility, drainage and flood control. These things don't recognize borders. I like the approach of working with different groups to solve these problems. Somehow, there are common interests that bring everyone to the table.” ©

Wong was born on the former Portuguese island of Macao and came to the U.S. in 1980 to study civil engineering at the University of Houston. Though his English was limited, he excelled in his coursework. Upon earning his B.S., he immediately began pursuing his graduate degrees, focusing on soil and geotechnical engineering under late UH Professor Mike O'Neill.

Wong's research for his master's degree involved the construction and operation of a device used to study methods of pile driving—forcing a column into soil or sand—for construction purposes. This research

Ven Pinjala

Senior Principal Business Consultant, AspenTech



Ven Pinjala
Ph.D. Chemical Engineering

Some technologies are so complex that it literally takes a person with a Ph.D. to sell them. That is the role Senior Principal Business Consultant Ven Pinjala (1981 MSChE, 1985 PhD ChE) fills for AspenTech, a firm that specializes in developing software for companies in the chemical industry.

AspenTech's programs, for example, are used to design and remodel chemical plants at the lowest possible capital expense. Such efforts, by their very nature, require an in-depth understanding of reaction engineering, the field Pinjala focused on in his Ph.D. studies under Cullen Professor of Engineering Dan Luss.

“If you look at any customer-facing organization, you have sales people. They are very good at selling... but they don't necessarily have an in-depth understanding of the product from a technical point of view, so they don't know how it can be applied to the needs of a specific customer,” Pinjala said. **“That's where I come in. I work with the customers to learn exactly what they want to accomplish and put together the information that is going to make it easy for the sales people to sell and for the customer to accept our software.”**

Not surprisingly, Pinjala didn't start his post-Ph.D. career in this sales role. Instead, he went to work as a researcher in industry, where he expanded his technical expertise and gained a deeper understanding of the challenges facing companies in the chemical sector, he said.

These knowledge bases, he added, serve him well in his current sales and marketing-related position, where he's asked to address not only technical issues, but business and corporate challenges facing the companies that AspenTech does business with. Of course, the level of technical expertise he achieved while studying at the Cullen College plays a huge role in these efforts, as does another skill he picked up while earning his degree: the ability to approach challenges and solve problems independent of outside guidance. Doctoral students, said Pinjala, are given very broad problems that are theirs to solve, with relatively little guidance or explanation. That is the same type of situation he deals with in his day-to-day efforts with AspenTech, he said.

“If customers are trying to do something, I'm trying to make sure what they purchase from us ultimately contributes to meeting that need,” he said. **“How do I make that match? I have to recognize what is needed to make it happen and then do it. There's a goal out there and I want to make sure that it gets met.”** ©

Gerri and Larry Snider (1955 BSIE)
Retired

Moved to Give

By Toby Weber

Larry Snider launched a career at the Cullen College that took him and his wife Gerri around the world. Now in retirement, they're motivated by faith and by gratitude to give back. »

» Even though Larry Snider (1955 BSIE) graduated from the UH Cullen College of Engineering more than 50 years ago, the struggles he and his wife, Gerri, overcame will be familiar to many of the college's more-recent graduates. Larry worked 40 hours per week while taking a full slate of classes, and Gerri worked full time for the telephone company and managed the household. Together, they struggled and managed to scrape by, but just barely.

Other aspects of their story will be far less familiar, though, to the point that the life they've led would be hard for many people to imagine. Over the half century after his graduation, Larry's career took the family around the world as his talents and drive led companies to recruit him from one new position to another. They moved a total of 35 times as Larry did everything from analyzing malfunctioning industrial furnaces in Houston to developing oil fields in Iran to leading a coal brokerage firm based in Cincinnati.

Now, the Sniders' hard work has put them in an enviable position: They spend much of the year at their home on the banks of Lake Conroe while also traveling frequently, usually in the form of months-long cruises around the world.

Motivated by their faith and by a sense of gratitude toward the University of Houston, they also use their good fortune to help others through scholarships and gifts to the Cullen College. "The education the college gave me was what started me on my career. I feel that I owe back," said Larry. "We want to help people so that they don't have to do what we had to do."

Working...

Larry Snider grew up in Oklahoma during the great depression, the son of a half-Cherokee father who, when it was available, found work as a pipe fitter. It was his father who instilled in Larry the work ethic that enabled him to hold a full-time job and still earn his B.S. in process engineering (a hybrid of chemical engineering and industrial engineering) from the Cullen College.

Larry weighed multiple job offers upon his graduation, ultimately settling on a position with Sheffield Steel that paid \$405 per month—\$5 more than the other offers he received. At Sheffield, he was tasked with finding the cause of malfunctions in the company's large blast furnace. In order to see how they operated, he rode in a small car normally used to transport coal, ore and other ingredients to the furnace.

His stay with Sheffield was short, though. After three years, Larry took a post in Fontana, Calif., helping import an oxygen furnace for Kaiser Steel. Larry was needed in California immediately, leaving Gerri to manage a cross-country move with a young daughter. "I had to sell the house by myself—I had never done that before—and I had to hire the movers and handle that end, which I had never done either. I had to fly on an airplane to California, and I had never flown or left Texas before. It was quite an education," she said.

After his stint with Kaiser Steel, Larry took a job with consulting firm Arthur Young. That position, in turn, quickly gave way to the Sniders' biggest move: a post in Iran, helping the state-run oil company and the world's largest refiners increase production and build a marine loading terminal.

Their time in Iran was difficult, the Sniders say. The language and cultural barriers left them somewhat isolated, and the extreme heat during the summers made a "normal" day almost impossible. After about two years they returned to the states for a new post for Larry at Booz Allen.

A few years, a few projects and a few moves later, Larry reached a career milestone, becoming, at the time, the youngest vice president in the history of Booz Allen (now Booz Allen Hamilton) at age 33 and opening the firm's Dallas office.

While operating that office, Larry put his hybrid chemical engineering/industrial engineering degree to use in a consulting project for City Services Oil Company. As was common practice at the time, development geology, which focuses on drilling wells to expand production in new reservoirs, was placed under the company's exploration geology budget. The consulting team saw that development geology was often neglected, however, because all funds had been spent on exploration geology, which is dedicated to finding new deposits.

"The consulting team came up with the idea to put development under the production budget. By doing that, development geology got high priority for funds, since production people were interested in retrieving more petroleum," he stated. The plan was put into place by City Services and was hugely successful, and now practically all petroleum companies put development geology under their production operations.

In addition to fresh thinking, long hours and the hard work he put in, along the way Larry took a few unorthodox steps to get ahead. In one case, an individual working with Larry on a consulting project critiqued the apparent lack of industry veterans in an office he was managing.

"I was told 'I don't see any gray hair in your office. No matter how good a recommendation you come up with, no one will buy it because it's coming from a bunch of whippersnappers.' So I hired a few of the older guys from Booz Allen. I also tried to dye my hair gray. It didn't work, but I tried!" said Larry.

And Giving...

The level of dedication and hard work the Sniders have exhibited has now put them in position to give generously to a number of organizations and causes. They are motivated to do so in large part by their strong Christian faith. "We feel that if God has blessed you with financial resources, you're obligated to share with people who aren't as blessed," said Gerri. "The way we see it, our resources are 'on loan' from God, and He expects us to share them with others."

Their first round of giving, therefore, goes to their home church, where they tithe, followed by donations to other churches led by ministers they know, and charities and organizations that serve others, especially UH.

The Sniders' donations to the university are largely shaped by Larry's life experiences. As a Native American, for instance, Larry says he felt he was at a disadvantage compared to many of his contemporaries. He and Gerri are now doing their part to help other Native Americans overcome the challenges they face by establishing an endowed scholarship for such students at the Cullen College. Similarly, they have established a scholarship for female students, with the hope of having more young women choose engineering as a profession.

The Sniders have also donated to general college funds, and have established charitable trusts and endowments that name the college as beneficiary. These gifts, Larry said, are intended to assist students and to help the university get the recognition it deserves.

"As a UH graduate, I guess I have a chip on my shoulder. The university provides an excellent education to dedicated, hard-working students. Still today it's not getting its due as being a university with many research achievements, excellent faculty and quality graduates," he said. "Every UH alum and student should work very hard to ensure the university gets the evaluation and ranking that it deserves." ©



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Ji Yan Wu & Su - I
Daniel R. Wyant
Yokogawa Corporation of America
Michael Glenn Yount
Yu Zhao

THE QUEST FOR CLEAN WATER

By Toby Weber

Civil and Environmental Engineering Professor **Hanadi Rifai** uses everything from population databases to storm patterns to determine what ends up in bodies of water, how it gets there... and how much needs to be removed. »



Environmental engineering graduate students Yaa Kwakye-Amoah, Nathan Howell and Anu Desai collect water samples with Professor Hanadi Rifai at a retaining pond in the Houston area.



PHOTOS BY MARK LACY

Testing the Waters

» **Most** great cities owe their prominence, at least in part, to a body of water. Some have rivers running through them that make them a stop for trade and, with enough bridges, a good place to cross. Others, like Houston, have a port on a major body of water that brings cargo and commerce to their shores.

One of the challenges for such cities—Houston included—is ensuring the health of these water bodies by limiting the amount of pollutants to which they are exposed.

Professor Hanadi Rifai contributes to these efforts in Houston and beyond by creating sophisticated models of watersheds that help determine how much pollution a body of water is taking in and where that pollution is coming from. The pollution levels Rifai finds are then compared to what is deemed acceptable under the Clean Water Act and the Environmental Protection Agency's Total Maximum Daily Load (TMDL) Program.

“A body of water can assimilate some pollution, but as a rule, you should not give it more than it can take,” said Rifai. “That’s what the TMDL Program is all about. It’s essentially the pollution calorie count that a body of water can take. The goal of the program is to make the body of water fishable and swimmable.”

Building these models, Rifai said, is a hugely complex task. Typically, she and her research team start by combining multiple databases that quantify a watershed’s land use and land coverage, industrial and agricultural activity and potential pollutants that may arise from those activities, population distribution and density, soil types and topography.

Each of these, she said, are fed into a computer to form a single watershed model. Data collected out in the field, such as information gathered through water and sediment tests, soil tests (since what is on the ground usually gets washed into a watershed), and air quality tests (since what is in the air can precipitate into bodies of water and onto the ground), is also used to validate and refine the team’s computer models.

The challenges of gathering information, quantifying it and making it part of a large model differ from area to area, Rifai said. Modeling a watershed in an urban area such as Houston requires tracking more industrial pollutants and understanding how having large areas covered by concrete impacts a watershed. Models of rural areas must account for agricultural pollutants such as pesticides, as well as the impact of any livestock that live in the watershed.

These models and the real-world tests supporting them are then used to determine how much pollution a body of water is exposed to in light of the total amount of pollution that is considered acceptable. This sets the stage for the EPA and other interested parties to solve any pollution problems a body of water might have.

“When we come up with these system-wide models, they’re used for decision making,” Rifai said. “The EPA will sit down with officials and stake holders in these water bodies and figure out who is responsible for reducing pollutants.”

Determining exactly what actions should be taken to reduce pollutants is a separate field of science from Rifai’s watershed modeling, and the strategies and plans change depending on the problems. If sediment is an issue, for example, retaining ponds that allow sediment to settle before it reaches a major body of water can be constructed. If a body of water has too much industrial waste, the businesses responsible for that waste can be mandated to reduce their pollution levels.

(Opposite) Cells of water samples from local sources are subjected to an IDEXX Colilert test. Viewed under a black light, the fluorescent cells indicate the presence of E. coli, while the yellow or dark cells positively identify coliform in the sample.

(Above) UH engineering professor Hanadi Rifai holds a set of water samples before subjecting them to an IDEXX Colilert test in an effort to detect the presence of E. coli and coliform in the water.

Preparing for the Storm

Another area of application for this research lies in the newly formed SSPEED Center, of which Rifai is co-director. The center—whose acronym stands for Severe Storm Prediction, Education, Evacuation from Disasters—is made up of researchers from multiple universities in Texas and Louisiana, including UH, Rice University, Texas A&M University, Texas Southern University, Louisiana State University and others.

Each of these universities, said Rifai, houses expertise in an area directly related to severe storms, disaster preparedness and

evacuations. UH researchers, for instance, possess expertise in water quality and sensing; at Rice, in flooding; at TSU, in transportation and traffic flow.

By combining all this talent under the SSPEED umbrella, individual researchers can work together to conduct research projects that take comprehensive approaches to severe storms and flooding (such as connecting localized flooding and rainfall models with the National Hurricane Center’s hurricane projections), evacuations and other issues.



“From the SSPEED perspective, my interest is in looking at our watershed. I’m working on water quality, others are working on flooding. We should be in contact because those things are obviously connected,” she said.

In addition to providing a forum for collaboration, Rifai said SSPEED is designed to offer students at the member institutions an interdisciplinary understanding of what a severe storm or disaster entails from the standpoint of preparation and recovery. The information students will be exposed to may include everything from flooding models, storm tracking and path projections, to fields that deal more heavily with the social sciences, such as what motivates individuals to evacuate.

“As an engineering student, you might be motivated to learn about atmospheric science or other phenomena that you wouldn’t encounter in a traditional engineering curriculum,” Rifai said. “I see the influence of the center growing over time as we reach out to other disciplines and cross-pollinate with different programs.”



Jesse Gonzalez (1969 BSCE)
Chairman, SpawGlass Employee Holding Company
UH Distinguished Engineering Alumnus (2003)

From Legacy to Leadership

Jesse Gonzalez began his career with SpawGlass as a laborer and has risen to chairman of the \$400 million-a-year company

By Shar-day Campbell

Jesse Gonzalez (1969 BSCE), chairman of SpawGlass Employee Holding Company and 2003 Distinguished Alumnus of the UH Cullen College of Engineering, is a living testament to the fundamental principle that hard work goes a long way.

Coming from humble beginnings, Gonzalez began his career with SpawGlass—a general contractor—by his father’s side in high school. His father worked for SpawGlass as a laborer and foreman for 33 years.

Married as a sophomore in college, Gonzalez supported his family while studying at the Cullen College by continuing to work for SpawGlass. When asked why he chose the University of Houston, he cited the same reasons many students do today.

“The university offered the work-life balance I needed,” he said. “I wouldn’t have been able to pay for school and support a family if it hadn’t been for the flexibility of Saturday labs and night courses.”

After graduating, Gonzalez was hired full time by one of the company’s co-founders, Louis Spaw. He then went on to hold several leadership positions, ranging from vice president of operations to spearheading the company’s entry into the non-union market with Cahaba Construction. He later became the president of SpawGlass.

“Second to my parents, Louis is the most influential person in my life,” said Gonzalez. “What I am and who I am is because of him.”

It was this connection with Louis Spaw, who became his mentor, and his history with SpawGlass that interested Gonzalez in purchasing the firm. Along with nine other employees (affectionately known as the “SpawGlass 10”), Gonzalez bought controlling

interest of the company in 1991 from a French firm that had acquired the company from Louis Spaw and Frank Glass in the 1980s. In 1993, they acquired 100 percent ownership.

Since the purchase, SpawGlass has thrived, grossing \$80 million in 1991 to almost \$400 million in 2007. Some of the company’s notable projects include the renovation of the Texas State Capitol Building, Philip Guthrie Hoffman Hall at UH, the Butterfly Museum and the University of Houston-Downtown Commerce Street Building. The company has offices in Houston, San Antonio, Austin and South Texas.

A pioneer in the industry, SpawGlass built a company office building in Houston that is certified by the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED). The building is the first in Houston to receive this certification and the fifth in Texas.

As a first-generation college graduate, Gonzalez credits a great deal of his success to his education. A man of reciprocity, he is a firm believer that one should give back to those who support him. That is why he capitalizes on every opportunity to give back to the university and the college.

“We all have something we can contribute,” he said. “Alumni are the heartbeat of the university and the reason it continues to prosper.” ☺

The Road to Success

Charles Beyer paves the way for current and future engineering students

By Shar-day Campbell

Charles Beyer (1972 BSCE, 1977 MSCE), founder and president of Beyer Construction, has paved enough roads to go from here to Seattle and back.

Beyer's own road to success is deeply rooted in his collegiate experience. Paying his way through school by working at a local construction company, he chose the University of Houston Cullen College of Engineering for its reputability, accessibility and practicality.

"Having seen what the UH alumni I worked with did, I realized it was the perfect fit," he said.

Shortly after receiving his degree and entering the workforce, Beyer realized that success in a competitive market required becoming immersed in all aspects of business. For that reason, he took fundamental business courses as electives while pursuing his master's degree in civil engineering from the Cullen College. These courses, he said, have allowed him to interact effectively with business, finance and accounting professionals in their own language.

This educational background provided him with the tools he needed to lead. At the age of 29, he was named president of his mentor's construction company and six years later, he founded Beyer Construction. After 25 years in business, Beyer Construction has completed over 1,000 projects, currently employs 250 people and does an estimated \$50 million a year in roadwork.

The level of success Beyer has attained would lead some to look ahead and not back. Determined not to do so, however, Beyer began to explore ways to help bring UH civil engineering alumni together. Along with a few other alums, he helped to launch an annual civil engineering luncheon in 2003, giving the alumni a chance to network with one another.

"I wanted a networking luncheon for UH civil engineering graduates that was a pillar for people in the city," said Beyer. "Anything that I can do to help the university, I will. It was instrumental in opening doors for me and it can do the same for others, as well."

Many alumni use the event to establish professional relationships, some of which have resulted in on-the-spot job offers. The luncheon has grown from 30 or 40 participants in its first year to nearly 200 last year. Beyer is passionate about facilitating the alumni-to-student connection and offers students advice whenever he can.

"Every business is about relationships," advised Beyer. "Networking allows you to find the common thread that all alumni share." ☺



Charles Beyer (1972 BSCE, 1977 MSCE)
President, Beyer Construction
UH Distinguished Engineering Alumnus (2001)

..... **1960's**

Raymond T. Garcia (1964 BSPE) is president of the Harris County Department of Education Board of Trustees. He was selected by the Texas Association of School Boards to participate in a year-long education leadership study program.

..... **1970's**

H. Dean Cubley (1970 PhD EE) was elected to Safeguard Security Holdings' board of directors. He is currently president and chair of ERF Wireless, Inc.

Cobb, Fendley & Associates, co-founded by **Odin Cobb** (1971 BSCE, 1979 MSCE) and **William "Bill" Fendley** (1971 BSCE), received a 2008 Engineering Excellence gold medal award in surveying and mapping technology from the Texas Council of Engineering Companies.

Cynthia Oliver Coleman (1971 BSChE) was named the 2007 Woman of Excellence by the Society of Woman Engineers—Houston Area. She was also honored as the 2007 Outstanding Volunteer by the Houston Alumni Organization.

Victor M. Zepeda (1974 BSCE) served as chair of the Greater Dallas Hispanic Chamber of Commerce in 2006, which was recognized as Large Chamber of the Year by the U.S. Hispanic Chamber of Commerce for its programs.

Leo P. Garcia (1978 BSCE) was named senior manager of The University of Texas Office of Facilities Planning and Construction. In this role, he is responsible for staff and project management for all of the office's Houston-area projects, including projects in the Texas Medical Center.

..... **1980's**

Ka Ming Ng (1980 PhD ChE), chair and professor of chemical engineering at Hong Kong University of Science and Technology, recently collaborated with the founder of MitoPharm Corporation, Robert Ko, to develop a new extraction process for schisandra B, an ingredient of the schisandra berry which is used in traditional Chinese medications.

Mark L. Loethen (1981 BSCE) was appointed city engineer for the City of Houston Department of Public Works and Engineering.

Robert E. McDonald (1981 MSCE), associate professor of marketing at Texas Tech University, received the 2007 Chancellor's Council Distinguished Teaching Award, the highest award given by the university for teaching. He was also awarded the United Supermarkets Professorship in Marketing.

Bruce Ganer (1984 MSPE) was named vice president of exploration and development and a board member for Southern Star Energy.

Harry Ward (1984 BSCE) was named Civil Division Director at Carlson Software. He is also director of the training division at Carlson College, a training facility for Carlson Holdings Business.

Sohail Parekh (1987 BSEE) joined Infoblox Corporation as vice president of engineering and will oversee its leading core network service appliances.

John Winter (1988 PhD ChE) has been appointed vice president of engineering for Evergreen. He previously served as chief gasification engineer for General Electric.

..... **1990's**

Lloyd A. Irvin (1992 BSEE) was appointed vice president of operations at Dashiell Corporation, where he has worked for 15 years.

K. Earl Reynolds (1993 MSPE) was elected vice president of strategic planning for Devon Energy. He previously served as vice president and general manager of Devon's International Division.

Mihir Jobalia (1994 MSChE) joined ThinkEquity Partners LLC as managing director and head of software banking.

Bryan P. Kennedy (1996 BSCE) was promoted to vice president and regional office manager of the Jones & Carter, Inc., Dallas office. He joined Jones & Carter in 1996 and was previously the Land Development Department Manager in the Houston office. He was the 2006 recipient of the UH Cullen College of Engineering Young Engineering Alumni Award.

David Seburn (1996 MSChE) has been appointed vice president of polysilicon for Trina Solar and is responsible for evaluating potential upstream investments in polysilicon production.

..... **2000's**

Tanushree Hiremath (2004 MSENVE) was named 2008 Young Engineer of the Year by the American Society of Indian Engineers.

..... **Deaths**

John C. Schwartz (1941 BSME) passed away on Sept. 23, 2007. He served a combat tour in World War II flying B-24 Liberators and flew more than 50 missions as part of the Berlin Airlift. He later served as chief of engineering development for the helicopter program at Wright Field in Dayton, Ohio, and completed his Air Force career as a plant representative at Boeing's operation in Wichita, Kansas. He retired from the service in 1970 and was honored with the Air Force Meritorious Service Award.

Frank C. Carsten, Jr. (1949 BSCE) passed away on Sept. 5, 2007. Carsten served in the Navy from 1944 to 1946 before enrolling at UH. In 1956, he co-founded United Fabricating Company, where he served as president for more than 40 years.

Emeric E. Gruchalla (1949 BSEE) passed away on Sept. 1, 2007. He attended UH after serving in the U.S. Naval Air Corp. After graduation, he worked for Houston Lighting and Power Company, now CenterPoint Energy, from 1951 until his retirement in 1987 as a principal engineer.

Peter R. McStravick (1951 BSME) passed away on Dec. 21, 2007. During his life, he designed coil tubing units for oil field services, journeyed with his family to Australia to live, worked in real-estate throughout the Tomball area and sang with his church choir.

George E. Anderson (1952 BSCE) passed away on Sept. 16, 2007. He served in the U.S. Army during World War II before earning his degree from UH. For thirty years, he worked with Transcontinental Gas Pipeline until his retirement in 1986.

Andrew Jackson "Jack" Maynard (1955 MSIE) passed away on Jan. 29, 2008. He served in the Army Air Corp during World War II. Following the war, he flew with the Air Force Reserves and the Kentucky and Texas Air National Guards. He earned his bachelor's degree in mechanical engineering from the University of Louisville in 1948 before pursuing graduate studies at UH. He ultimately pursued a career in the oil industry,

focusing on downhole tool design for Hughes Tools and Schlumberger Well Services.

Norman E. Spaulding (1964 BSEE) passed away on Oct. 3, 2007. He worked with Houston Lighting and Power for more than 42 years, where he managed both the substation and telecommunications departments. He was a member of the Northwest Masonic Lodge, Arabia Shrine Center and Tomball Shrine Club.

Hayati Balkanli (1971 PhD EE) passed away on Jan. 15, 2008. He was born and raised in Turkey

and graduated from the Turkish Military Academy. He received his bachelor's degree from Stanford and master's degree from The University of Texas. He held several patents and had his research work published in several technical journals.

Carson O. "Rusty" Ray Jr. (1971 BSEE) passed away on Nov. 21, 2007. He was a former owner of Logos Christian Book Store in Houston and, at the time of his passing, owned a videography company in Indianapolis. He was active in church activities and was an avid scuba diver.

Submit your class note online at www.egr.uh.edu/news/submissions/.

KEY

- AeroE — Aerospace Engineering
- ArchE — Architectural Engineering
- BioE — Biomedical Engineering
- ChE — Chemical Engineering
- CE — Civil Engineering
- ComE — Computer Engineering
- E — Engineering
- EE — Electrical Engineering
- EnvE — Environmental Engineering
- IE — Industrial Engineering
- ME — Mechanical Engineering
- MatE — Materials Engineering
- PE — Petroleum Engineering

ALUMNI NEWS

ENGINEERING ALUMS
VENTURE INTO SPACE

PHOTOS COURTESY OF NASA

Just within the last year, two University of Houston Cullen College of Engineering alumni have journeyed into outer space on Atlantis missions to the International Space Station.

Last June, **John "Danny" Olivas** (1993 MSME), made his first flight into outer space on the Atlantis (STS-117) mission to the space station. Olivas participated on two of the mission's three space walks to install a couple of truss segments on the station as part of its solar power system. He also performed an extravehicular "sewing job" to secure a hole in the thermal blanket on one of Atlantis' aft engine pods.

Interestingly enough, the expansion of the station's solar power system last June was necessary in order to provide sufficient power for the operation of various modules, one of which was installed by fellow alumnus **Rex Walheim** (1989 MSIE) and crewmates in February.

Walheim traveled to the space station as a member of the Atlantis (STS-122) flight whose primary mission was to deliver and install a European laboratory module. He participated on all three spacewalks to install the module, known as Columbus, marking the 100th completed spacewalk by NASA crews to assemble the space station. The STS-122 mission was Walheim's second flight into space—he was a member of the STS-110 mission to the space station in 2002.



UH alum Rex Walheim with Hans Schlegel, a mission specialist from the European Space Agency.



PHOTO BY TODD SPOTH

[A ROCKET ROAD
TO EDUCATION]

The Engines of Our Ingenuity, Episode 1421 • By Dr. John Lienhard

Dr. Lienhard watches four teenagers, hungry for learning, and they show him how education rises out of high purpose.

“Not another boys’ coming-of-age story,” a friend says when I recommend Homer Hickam’s book, *Rocket Boys*. But *Rocket Boys* does something remarkable with that genre. Homer Hickam was fourteen in Coaltown, West Virginia, when the Russians launched *Sputnik*. The steel companies were losing interest in Coaltown’s deep mining operation. The imminent death of the mine was obvious to everyone but Homer’s father, one of its senior managers. Young Homer senses the decay of his world on a visceral level. He sees very clearly that he wants to go to work for Werner von Braun, and to build rockets.

Football is king in Coalville—no sympathy for foreign rocketry. Homer looks for a book on rocket-making. Of course, there are none. He eventually recruits three friends, and they set out to invent their own rocket. Now let’s play for a moment with that problem—a real rocket that’ll travel miles straight up!

We need a chemical propellant and a binding agent for the fuel. We need to shape the fuel *within* the rocket. We need metals to withstand the temperature of burning fuel. The shape of the necessary supersonic nozzle is not only mathematically complex; it’s also a completely *unexpected* form. A true guidance system would be far too complex. Without one, we need accurate tail fins and a launch system to aim it properly. We need means for measuring the height of the flight.

All these things the four boys accomplished against a backdrop of economic and domestic chaos—and in a world that couldn’t comprehend their work. They eventually hurled a rocket six miles into the sky and won a national science fair prize as well.

On the surface, the story leads us through the problem-solving process. As it unfolds, we’re hardly aware that we’re learning thermodynamics, fluid mechanics, chemistry, dynamics, and metallurgy. That’s because each of those issues mirrors into one or another of the crushing problems that go with hacking a living out of a dying company town. It is a remarkable piece of multilevel story-telling.

Homer Hickam went on to become an engineer. He never met von Braun, but in the 1980s he joined NASA. He did meet the Russian engineers who launched *Sputnik*. And, in 1997, an astronaut carried one of his old rocket nozzles on the shuttle *Columbia*. Only ghosts of his childhood linger in the remnants of Coaltown. But they’re benign ghosts. They are that array of surmountable trials we must all undergo if our lives are to find any form or contentment. ☺

The Engines of Our Ingenuity is a nationally-recognized NPR radio program authored and voiced by John Lienhard, M.D. Anderson Professor Emeritus of Mechanical Engineering and History at the University of Houston. After 20 years on the air, over 2,350 episodes have run. The program airs Monday thru Friday on KUHF-FM 88.7 at 7:35 a.m. and 3:55 p.m. For more information about the program, visit www.uh.edu/engines.

Hickam, H. H., Jr., *October Sky* (aka *Rocket Boys*). New York: Island Books, 1999.



PHOTO BY THOMAS SHEA

Smart Materials

Mechanical engineering graduate student Atilla Kilicarslan works on a National Science Foundation-funded project under Professors Karolos Grigoriadis and Gangbing Song that is aimed at using shape memory alloy materials for precision actuator control. Such “smart” material alloys can provide a lightweight, inexpensive alternative for controlling the exhaust nozzle of a jet engine, which ultimately allows an aircraft to adjust its thrust.

Water samples from a local source are subjected to an IDEXX Collert test to identify whether or not coliform and E. coli are present in the water. This particular sample shows a large array of E. coli in the sample, as indicated by the number of fluorescent cells illuminated under a black light. Learn more about this research conducted by UH Environmental Engineering Professor Hanadi Rifai on page 24.

PHOTO BY MACK LACY



Get more UH Cullen College of Engineering news at www.egr.uh.edu/news.

ALUMNI EVENTS CALENDAR UH CULLEN COLLEGE OF ENGINEERING

May 4 20th Annual ASME/UH Cajun Crawfish Boil 1 p.m., Lynn Eusan Park, UH

May 9 Engineering Commencement 3 p.m., Cullen Performance Hall, UH

June 6 Distinguished Engineering Alumni Awards Dinner 6 p.m., Four Seasons Hotel, Downtown Houston
Honoring Billy Cooke, Charles Jones, Paul Ruchhoeft, Gregory Williams, Dennis Clifford

June 7–July 28 Summer Camps for High School Students For more information on available camps, visit www.egr.uh.edu/camps/

June 17 6th Annual Civil and Environmental Engineering Alumni Luncheon 12 p.m., HESS Club

For more information about any of these events, call 713-743-4200, e-mail alumni@egr.uh.edu, or visit www.egr.uh.edu/events.



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