

University of Houston Cullen College of Engineering

# [ Parameters ]

Fall 2001



UH Reengineers Energy Industry

STOP

# Dean's Message

Photo by Jonathan Cobb



Greetings from the University of Houston Cullen College of Engineering! I am happy to report that the past year brought many successes to our programs—in new faculty hires, staff hires and restructuring, increased enrollments and new program initiatives. We are making significant strides to a new level of excellence and want to communicate these to our alumni and friends.

With this issue of *Parameters*, our new Communications group has implemented major changes in style, format and coverage. We hope you like it! Also, in the future, *Parameters* will be reaching you twice a year (fall and spring) instead of three times as in the past. We believe this schedule will allow us to achieve higher quality and more meaningful coverage of the events in the college and the activities of our alumni.

This issue of *Parameters* is appropriately themed Energy, both from the perspective of the energy and commitment reflected in the many activities and successes of our faculty and students, but also the interactions and contributions of our college to the energy industry. Our professors play important roles through their research and center activities to enhance cost effective energy availability, production and utilization. A number of these programs are highlighted in this issue.

With the beginning of this academic year, we celebrate our 60th anniversary. In the first 22 years, we were largely a general engineering program in a private institution. In the past 38 years we have become multidisciplinary with 31 degree programs in five departments, and we are part of a public state institution. During this period, we have seen some our programs rise to the highest echelons of academic excellence and our rapid development as a quality engineering program has not been matched by many schools. We are proud of these accomplishments, and the 60th Anniversary provides an opportunity to celebrate these successes. In this connection, we are planning various special activities within the departments and college, and you can view them on our newly updated college Web site at [www.egr.uh.edu](http://www.egr.uh.edu).

If you haven't visited the college Web site in the past few months, check it out periodically for updated news and features. Also, make sure to join the college's alumni and friends listserv—it is e-mail news delivered to you monthly. See the back cover or the Web site for details.

Stay connected!

**Raymond W. Flumerfelt**  
Dean

## pa-ram-e-ter

*Pronunciation:* pə-'ram-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>

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

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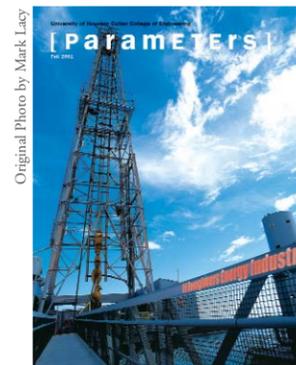
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The University of Houston is the doctoral degree-granting and largest university of the University of Houston System, a public system of higher education that includes three other universities: UH-Clear Lake, UH-Downtown and UH-Victoria.

The University is in compliance with Title IX.



Original Photo by Mark Lacy

## New Energy

A new energy is invigorating the Cullen College of Engineering. Our location in the energy capital of the world has positioned the college to be a leader in technological research and education. Faculty, students and industry partners benefit from our latest research in the field of energy; our efforts echo from the bottom of the ocean into the deep night of space.

**College Unveils New Brand, New Web**

The UH Cullen College of Engineering has a new brand identity. A new logo was unveiled Feb. 13. Designed by the UH Office of Publications, the mark is consistent with the university's brand identity used in the five-year, multi-million dollar advertising and marketing campaign to create a greater appreciation for the university's overall strengths among key audiences.

McCann-Erickson Southwest designed the "University of Houston: Learning. Leading." campaign. Using print, television and radio advertising, along with billboards and Internet banners, the campaign highlights the university's nationally and internationally recognized faculty and programs.

This year marks the college's 60th anniversary and the university's 75th anniversary. To commemorate this historic event, the years have been added to the logo (see the back cover).



Visit the redesigned site at [www.egr.uh.edu](http://www.egr.uh.edu).

As part of the new brand identity, the college launched its redesigned Web site on July 5 ([www.egr.uh.edu](http://www.egr.uh.edu)). The site



now includes a rollover menu with quick links for enhanced usability. Added features include a database-driven calendar, e-mail newsletter sign-up and archives, donors, detailed site map and a text-only version of the site. A live Webcast of the May graduation ceremony is also archived. Future events will also be aired live on the site. News items are available off the home page with an extensive newsroom of stories that link from the navigational bar.

The home page incorporates several images that capture new and old portrayals of engineering with technology leading at the top. The broken grid and small lines of varying colors represent the college's innovation of continually thinking outside the box. The college's Office of Communications produced the Web site. Harriet Yim designed the site with content support by Angie Shortt and Carrie Ann Davis.

**Chemical Engineering Faculty & Students Present Research at the Capitol**

Faculty and students from the Department of Chemical Engineering displayed their research results in the rotunda of the Texas State Capitol Jan. 17 to kick off "Research Education in Texas" week, an effort by five of Texas' major research universities to showcase selected research for lawmakers.

The presentations were given by chemical engineering Associate Professor Richard Willson; graduate students Jason Christopher Murphy and Phillip Ray Gibbs; and undergraduate student Shakala R. Collins. Their research involves DNA purification techniques that could be applied to disease diagnostics and gene therapy and the

improvement of screening processes that could produce purer medicines.

"It's important for lawmakers to see that exposing research education has real world benefits—both for the students and the people of the state," said Marco Mariotto, dean of Graduate and Professional Studies at UH. "The wealth of groundbreaking research at the University of Houston and Texas' other major research universities involves not only our faculty, but our students as well. This is research that has an impact on the current and future quality of life of Texans and the vitality of our economy."

**UH Brings Area Students to Campus for National Engineers Week**

As businesses across the nation strive to create a more diverse work force, the UH Cullen College of Engineering planted the seed for diversification by hosting "Introduce a Girl to Engineering Day" Feb. 22 as part of National Engineers Week.

UH engineering professors played host to a dozen fifth-grade girls from Windsong Intermediate School in the Friendswood ISD. Students saw live demonstrations in applied engineering, shadowed a professor in the lab and developed their own interpretations of engineering through interactive projects.

Also that week, the UH National Society of Black Engineers welcomed students from a dozen area high schools for their first Shadow Day. Approximately 40 junior and senior high school students were matched up with collegiate partners, toured the campus, learned about engineering and sat in on an afternoon class.

Right: Houston-area high school students build tall structures using only straws and tape and then test for strength with weights. This National Engineers Week program was coordinated by the UH National Society of Black Engineers.

Bottom: Teacher Judy True and her fifth-grade class of girls from Windsong Intermediate School spent the day at the UH Cullen College of Engineering for "Introduce a Girl to Engineering" as part of National Engineers Week.



**College Takes Over TMAC**

In March, Hamid Parsaei, the new chair for the Department of Industrial Engineering, assumed leadership of the Texas Manufacturing Assistance Center. TMAC is a non-profit organization that provides industrial engineering services to small and mid-size manufacturers with the purpose of increasing their global competitiveness. Prior to the UH Cullen College of Engineering taking control of TMAC in the fall of 2000, the program was under the C.T. Bauer College of Business through the Small Business Development Center.

**Passage of Tier 1 Funding Will Help Bolster UH Academic, Research Growth**

Growth of instructional and research programs at the UH System received strong support from Texas lawmakers this year with the approval of more than \$100 million in tuition revenue bond projects, the creation of the Research Excellence Fund and a \$37 million increase in state funding for the next biennium.

The four UH System universities received more than \$100 million in tuition revenue bond projects to fund new facilities, including \$51 million for the first phase of a science, engineering and classroom building at the UH main campus. The building will be constructed in two phases with each phase having approximately 245,000 square feet of classroom and laboratory space.

“The \$51 million tuition revenue bond for the science, engineering and classroom building on our main campus is the largest project approved by the legislature for any state university this session, and it’s an essential part of raising the quality of our programs in these areas as we go forward,” said Arthur K. Smith, UH president. “All these projects are essential in providing our faculty and students with facilities comparable in quality to those offered by any higher education institution in Texas and the nation. This action by the legislature will play a large role in our recruiting and retaining the best faculty available in key research fields.”

UH will receive an estimated \$12 million over the next two years from the Research Excellence Fund. This new permanent funding source will be used to help retain top faculty researchers, to attract more top faculty and students to UH and to upgrade the system’s teaching and research infrastructure in order to compete for the best talent nationally and internationally.

**‘Monuments, Mills, Missile Sites’: HAER Traveling Exhibit Visits UH**

The Historic American Engineering Record salutes the beauty of form and purity of function with the display Monuments, Mills, Missile Sites: Thirty Years of the Historic American Engineering Record. The traveling exhibit, which is open to the public, displays photographs and technical drawings of engineering marvels and industrial icons developed in the last two centuries. The Statue of Liberty, 19th century steam engines, suspension bridges and large steel structures are a few of the technological advances highlighted at the exhibit.

CONCEPTUAL ILLUSTRATION

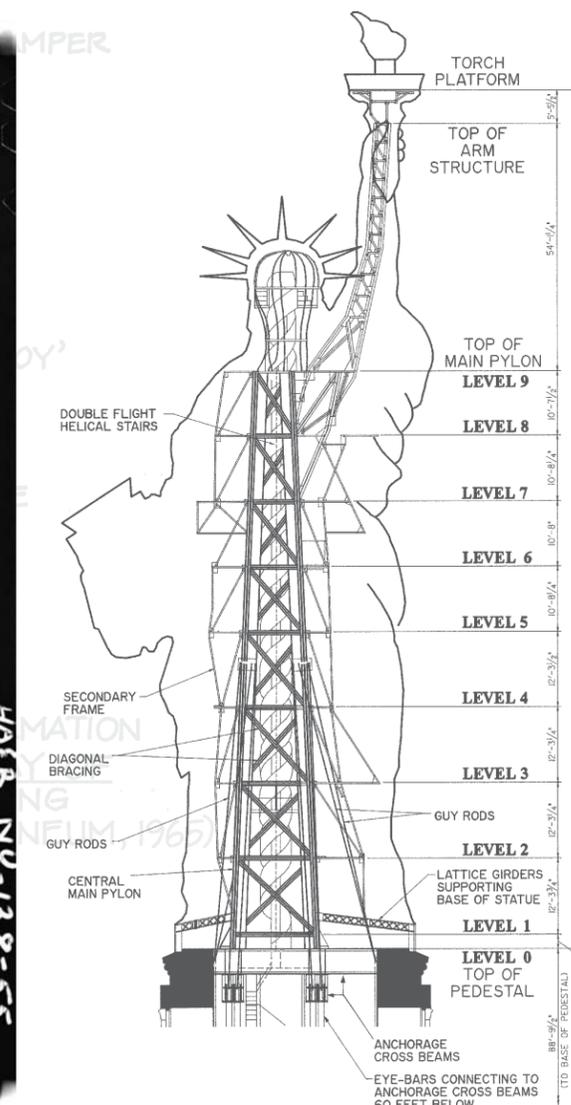
SPHERICAL BOMB CASING (ABOUT 54" DIAMETER)

Sponsors for the exhibit include the American Society of Civil Engineers: Houston Branch, the American Institute of Architects—Houston Chapter, Engineers Council of Houston, UH College of Architecture and UH Cullen College of Engineering and Fugro South Inc. The exhibit will be on display at the Gallery Room in the UH Gerald D. Hines College of Architecture building through Oct. 10.

For more information on the HAER exhibit, visit [www.egr.uh.edu/news/0701/?e=haerexhibit](http://www.egr.uh.edu/news/0701/?e=haerexhibit).



Photos Courtesy of The Library of Congress



### SWE Students Compete in National Boeing Team Tech Competition

At the Society of Women Engineers 2001 National Conference, eight students from UH Cullen College of Engineering competed in the Boeing Team Tech Competition. Presenting research on the design of a small futuristic lunar community, the students competed against nine other schools. The competition was established to emphasize the role of teamwork and how to interface with industry in the engineering process.

The students—Team Leader Burcin Ozcan, along with May Shek, Arti Patel, Sandra Geffert, Elaine Shomberg, Mary Saulog, Teang (Anne) Ung and Pamela McKnight—are from cross disciplines and had two industry advisors, John Keller, Ph.D. and Tony Handford, Ph. D., both from Lockheed Martin Space Operations.



Boeing Team Tech Competition members (front row) Teang (Anne) Ung, Mary Saulog, Arti Patel and May Shek; (second row) Pamela McKnight, Burcin Ozcan, John Keller and Tony Handford.

### UH Hosts Consortium to Battle Area's Environmental Concerns

The UH Department of Chemical Engineering assembled a consortium of industry and university representatives for a roundtable discussion on pollution reduction on March 22. The consortium linked researchers from local utility, petrochemical and materials manufacturing industries, local universities as well as experts from selected technology companies and universities outside the area. Companies represented at the consortium

included Kellogg Brown & Root, Pavilion Technologies, Reliant Energy and Haldor Topsoe.

“Partnerships between industrial and university researchers can be very effective,” said Michael Harold, chair of the UH Department of Chemical Engineering. “This is particularly true in the pollution reduction area because many of the short-term and long-range challenges are shared by chemical producers and engineering companies

“University researchers can focus on new ideas, discoveries, and fundamental aspects, while industrial researchers can carry out further development to make the discoveries more economically viable. By working together we can accelerate the discovery and implementation of cost-effective technology solutions to the air quality challenge. This is critical for the Greater Houston Area in balancing the dual goal of having clean air and a robust manufacturing base.”

### Research Experiences for Undergraduates

This summer, 13 students from across the country gathered at the UH Cullen College of Engineering to participate in the 2nd Annual Research Experiences for Undergraduates. Sponsored by the National Science Foundation and UH, the program is designed to provide qualified undergraduates with the opportunity to conduct a research project under the guidance of a faculty mentor. The projects cover a variety of topics, including the diverse fields of control systems, biomedical engineering, optics and computer programming.

“These undergraduate students are working at the level of first year master’s students by the end of this program,” said Stuart Long, associate dean for research at the UH Cullen College of Engineering. “Their research skills are more refined and they acquire a new maturity about their work.”

The students also enjoyed trips to an Astros game, Moody Gardens and other events around town. Students receive a \$3,500 stipend, room and board and travel allowances.

For details about the program, visit [www.egr.uh.edu/news/0801/?e=reu](http://www.egr.uh.edu/news/0801/?e=reu).

### Disease Prevention Goal of Space-Related Research by UH Scientists

The potential for breeding bacteria in spacecraft and their threat to astronauts on extended space missions is the focus of a newly commissioned study led by Richard C. Willson, UH professor of chemical engineering and George E. Fox, professor of biology and biochemistry.

The research project, “Microorganisms in the Spacecraft Environment,” will study the effects space flight will have on immunology, infection and hematology. Microbial infection has been identified as a significant factor that could affect human space flight. The project will receive \$308,680 in its first year from Houston-based National Space Biomedical Research Institute, a research consortium investigating health concerns facing space explorers.



“One goal will be to determine the microbial content of the air and water systems on spacecraft,” said Fox. “The information will be useful for studies of the microbial ecology of the space environment and as monitoring tools on eventual long duration missions.”

### UH Hosts Seminar To Examine Storm Drainage Issues

Future flood control programs, history of flooding in the Gulf Coast area and lessons learned from Tropical Storm Allison were the focus of **Drainage Forum: The Allison Experience**, a day-long program hosted by the UH Cullen College of Engineering Sept. 14.

Presenters at the forum included:

- ▶ Robin Green, Mark Kosmoski and Tom Rolen, *City of Houston Department of Public Works & Engineering*
- ▶ Scott Wells, *FEMA*
- ▶ Frank Gutierrez, *Harris County Office of Emergency Management*
- ▶ Steve Fitzgerald and Gary Green, *Harris County Flood Control*
- ▶ D. Wayne Klotz and Gary Strusik, *Klotz Associates, Inc.*
- ▶ Thomas C. Lambert, *METRO*
- ▶ Bill Read, *National Weather Service*
- ▶ Trent Slovak, *PBS&J*
- ▶ Delvin Dennis, *Texas Department of Transportation*
- ▶ Jim Thompson, *Thompson Professional Group*



- ▶ Diana Laird, *U.S. Army Corps of Engineers*
- ▶ Charles Penland, *Walter P. Moore & Associates, Inc.*
- ▶ Arthur K. Smith, *University of Houston System*
- ▶ Raymond W. Flumerfelt, *UH Cullen College of Engineering*
- ▶ C. Vipulanandan and Theodore Cleveland, *UH Department of Civil & Environmental Engineering*

View the Webcast at [www.egr.uh.edu/forum](http://www.egr.uh.edu/forum).



Photo by Mark Lacy

# Oracles of Oil

BY CARRIE ANN DAVIS

two professors with a simple goal  
—to transform society's thinking process about oil

Oil. It shapes and destroys nations, defines cultures and permeates every aspect of modern life. No one knows this better than Michael Economides and Ronald Oligney.

Leaders in their field, these two professors have traveled the globe, working in 72 countries as technical advisers to Fortune 500 and national oil companies. Predicting trends in the energy market is one of their trademarks. They have been interviewed on CNN, MSNBC and on "Energy News Live." In addition, they have written several scholarly articles on energy, oil and politics, including the best-selling book, *The Color of Oil*, which was on the bestseller list in Houston for 13 weeks. Prior to joining the UH Cullen College of Engineering in 1999, Economides and Oligney were key to the development of the Global Petroleum Research Institute at Texas A&M University.

"We came here trying to establish a much more robust presence for the University of Houston in the energy community," said Economides, professor of chemical engineering. "We have been working with major people in the energy industry here—major companies as well as the federal government to secure an important role for the university in future research."

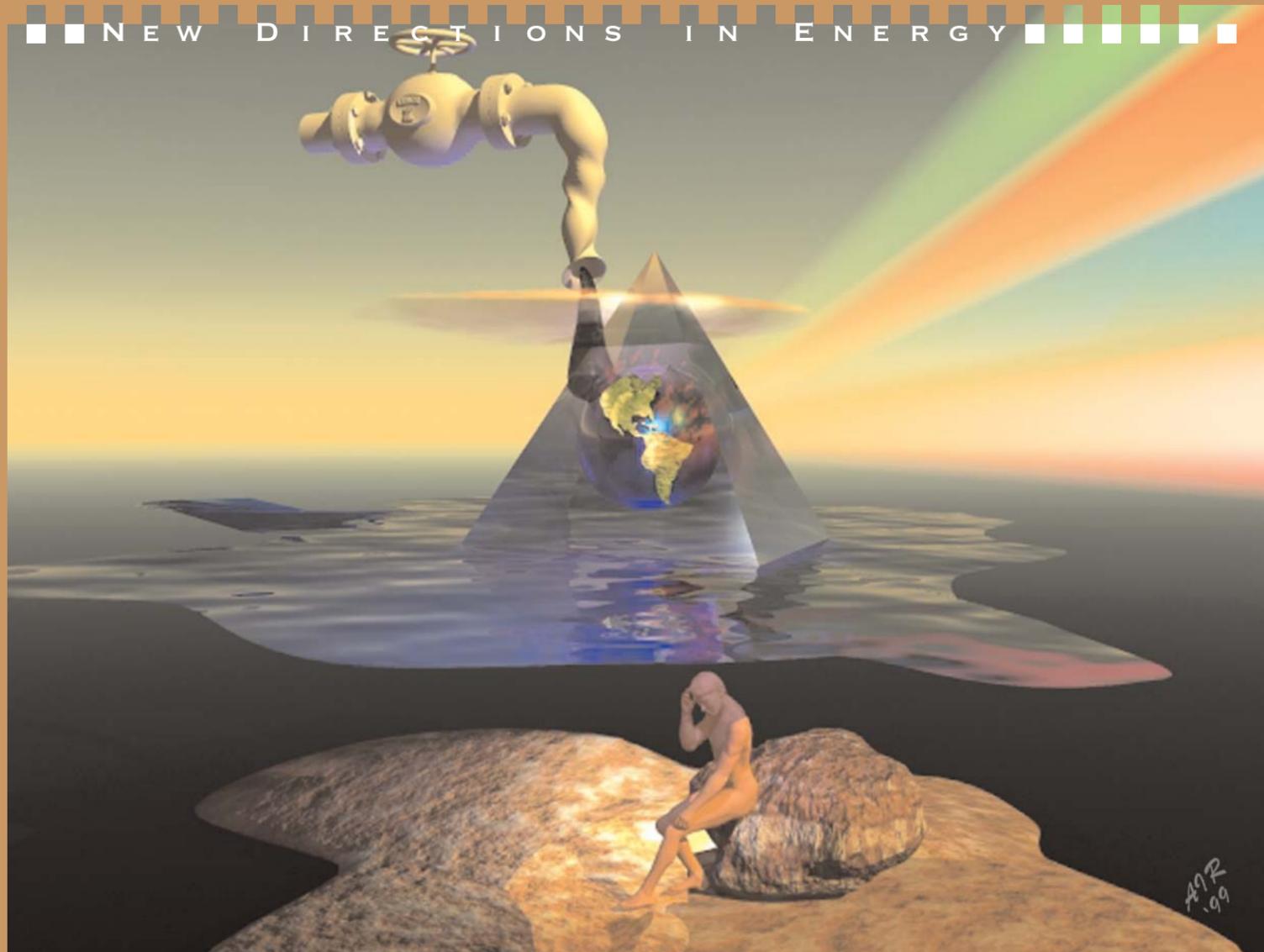
Using the energy industry as a model, the college's focus must be on applied research and working in partnership with local and international companies.

"Properly managed, these relationships have a lot to offer," explained Oligney, chemical engineering adjunct associate professor. Working with universities has many advantages, according to Oligney. Universities have lower business overheads and student labor costs are minimal. In addition, universities are very flexible and able to change project orientation quickly. One of the best advantages the university offers is numerous experts in a wide range of disciplines.

One of the key projects at UH is an ultra-deep offshore technical initiative, which is located off the shores of Mexico in 6,000-foot deep waters. Both professors think the project has major promise as a technological renaissance. To Economides this is a trillion-dollar opportunity, equating it to El Dorado, the mythical city of gold, not only for the oil and gas to be excavated, but also for the associated technologies that will stem from this project.

"I always tell people the main benefit of NASA is not to send the man to the moon, but all the other associated technologies that came as a result of that," »

Ron Oligney and Michael Economides at the Ocean Star Offshore Drilling Rig and Museum in Galveston.



"The Color of Oil" Original Artwork by Armando Izquierdo

» explained Economides. "Things like Teflon, information technologies, computing technologies and so on are a result of NASA's efforts. It is almost like it is built in a pyramid."

With the university located in the energy capital of the world, the college is uniquely positioned to integrate itself by creating new innovations and becoming a valuable partner in the energy industry. Economides says that other universities perceive UH as the industry's favorite—flush with money and support—due to the university's prime location in Houston. While it is not entirely accurate, it is the perception others have of UH.

"Houston is the most dynamic city in the world," exclaimed Economides, and he should know, he has been to most of them. "I am very sold on Houston. This place is magnificent for what we are trying to do.

You have a lot of dynamic people around. We just need to gel this together and it will take a lot of high level support from the university."

"I do think it is an uphill struggle," Economides goes on to explain. "I am challenged by uphill struggles. If it wasn't difficult, I wouldn't be doing it. I am always optimistic, but it is very difficult. I want to emphasize that this is not a simple thing by any means to transform not only a structure, but a thinking process as well."

One of the obstacles in achieving this goal is a lack of public understanding about the oil industry. In writing the book, *The Color of Oil*, the duo hoped to better explain the "impact, influence and importance of petroleum on humanity." The book has garnered great success worldwide and has reinforced the university's position as a home for energy experts.

Using their personal experiences in the field, metaphors and vibrant paintings by Armando Izquierdo, the two authors create an image beyond the public's two-dimensional perception of the industry and enliven the subject matter with color.

"The oil industry is typically cast in terms of black and white, most often black, which belies the importance of the industry and the commodity that it shepherds," explained Oligney. "This is a story of people and industry of many hues."

The authors believe that "energy consumption and access may have already replaced industrialization as the yardstick that measures the wealth and poverty of nations." Consuming energy is essential to ensuring the prosperity of modern society. "Abundant, cheap energy should always be the goal: wealth through energy."



"Black" Original Artwork by Armando Izquierdo

Money is the power behind energy production. Estimates at the beginning of 2000 suggested that within 10 years the total capital investment in the worldwide exploration and production of oil would exceed \$1 trillion, according to *The Color of Oil*.

Recent power shortages in California have brought the subject of energy to the forefront of media and public attention. And while areas around the world are having difficulty meeting existing energy needs, in the next 20 years energy demand is estimated to increase by more than 50 percent. Currently, 90 percent of the energy supply comes from hydrocarbons, and according to Economides this is not slated to change for another 20–50 years. But energy preservation is not a concern for these industry experts. Their views on conservation are contrary to the public's trend toward political correctness.

"We have previously said that conservation is often a code word to rally the presumably pragmatist folks," said Oligney. "Images here are of the SUV and the ubiquitous thermostat settings. If only the soccer moms were to quit driving those monster vehicles; if only Houstonians were to increase their summer thermostat

settings by a couple of degrees, and the Northeasterners lower theirs in winter, our energy woes will go away.

"Conservation has never played a significant role in reducing overall energy consumption. The reason is actually simple. Our society has become extraordinarily efficient, market forces would not have left it otherwise, and much of the increase in the energy demand stems not from the old, but from the new."

Computers and the Internet, according to Oligney, consume 15 to 20 percent of all U.S. electrical power. For example, a multi-server building consumes 85 to 100 watts of electricity per square foot while a typical office consumes only 5 watts per square foot.

"It is a mistake to believe that conservation can ever play the role that some want to attribute to it, no matter how many warm feelings the idea brings," said Oligney. Economides agrees.

"Energy and prosperity are so intimately connected with each other that people should not be complaining about energy costs, because it is so much related to the prosperity we all enjoy," said Economides. To him, the current movement toward the decarbonization of fuels has nothing to do with global warming, but rather it is the continuation of a 200-year-old trend.

The industry will eventually need to move toward the next step in the evolution of energy, which will be toward natural gas, and from there to hydrogen, according to Economides. Lighter fuels are more efficient—and as with oil production—cheaper fuel is always the goal. But for the next few generations hydrocarbons will remain the primary provider of energy.

In the meantime, research must continue. And the engineering of more economical ways to excavate and produce oil must be a process of continual improvement.

"Engineering is the mother of this industry," Economides summed up. "There is no question that the UH Cullen College of Engineering should lead anything that has anything to do with energy in this business."

# Cracking the Secrets of Oil

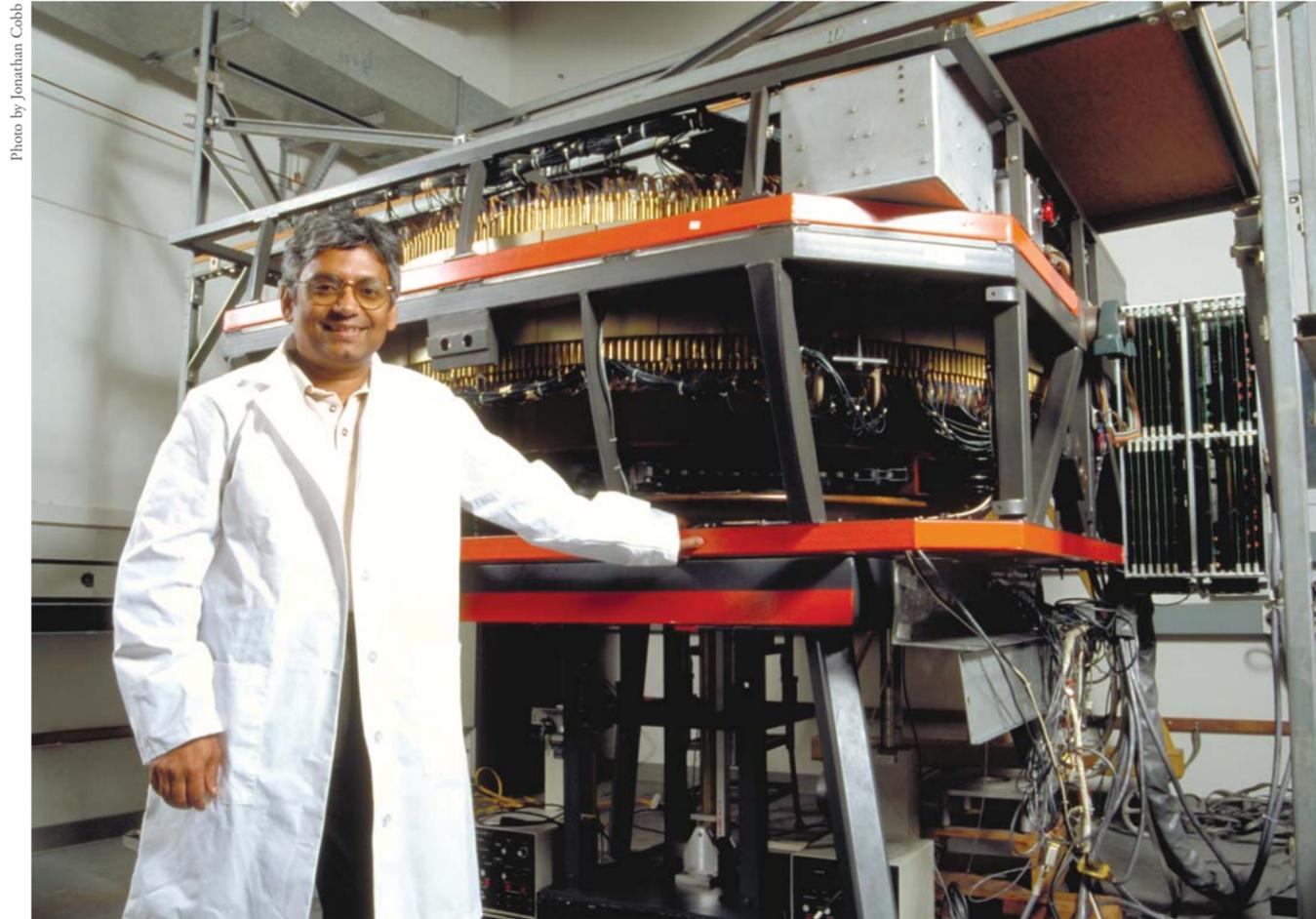


Photo by Jonathan Cobb  
Kishore K. Mohanty with the vertical CT Scanner, one of three in North America.

**Industry partnerships and grants equaling \$1 million from the U.S. Department of Energy assist Kishore K. Mohanty, professor of chemical engineering and director of the Institute for Improved Oil Recovery, in cracking open the secrets of porous, oil-containing rocks.**

Kishore K. Mohanty's goal is to get the oil out of the ground more efficiently for improved oil recovery.

"We study the structure of the sandstones and carbonates," said Mohanty. "Oil is not in a big lake or a pool underground—it is inside these pores which are 1/10 to 1/100 millimeter wide. This is why we do things on a very small scale."

Mohanty and his team of graduate students are studying how these structures affect the flow of oil, water and gases and how the process of extracting these elements out of the medium can be improved.

Through the Institute for Improved Oil Recovery, industry partners such as BP, Chevron, Exxon, PTS and Schlumberger Geoquest help provide funds and materials needed to conduct the research. These organizations also provide valuable feedback during a yearly review regarding the implementation of this research out in the field, helping to keep the programs focused on industry related issues.

The U.S. Department of Energy's funding allowed for research on three individual projects. A half million dollars is allocated to a research project called "The Effect of Capillary and Bond Numbers on Relative Permeability." Mohanty's roll in this project is to better understand the effect of flooding conditions on drainage relative permeabilities.

The second DOE project, "Fluid Rock Characterization and Interactions in Nuclear Magnetic Resonance Well Logging" intends to create parameters and interpretation methods for reservoirs that operate outside normal parameters. The third project, "Exploitation and Optimization of Reservoir Performance in Hunton Formation, OK" studies the mechanism under which oil is produced from the Hunton Formation and to propose techniques to optimize performance of these reservoirs using various technologies. These projects received funding of a quarter million dollar each.

In addition to the DOE work, the Texas Higher Education Coordinating Board is sponsoring "Computation of Transport Properties from Petrographic Images," one of the main projects currently housed in Mohanty's labs. The goal of the project is to develop a methodology and software package to compute transport properties of a formation from its petrographic images. Using a vertical CT Scanner, one of three in North America, the researchers construct three-dimensional reservoir simulation models based on thin-sections and core samples.

"We do it because research is fun," proclaimed Mohanty. "We help make the process more efficient and more effective. Oil companies have to improve their ways to do it better. Especially now since in the past 15 years oil company research has shrunk quite a bit. They rely on universities and service companies to provide a lot of the research functions. They want to be more flexible and be prepared for very low oil prices and the only way they can do it is to contract out some of the research."

*Energy research in the new millennium is a growth industry. Dr. Mohanty is one of many professors and researchers at the UH Cullen College of Engineering involved in energy research programs.*

## Engineering's Global Reach

The UH Cullen College of Engineering is now **offering master's programs in Petroleum Engineering and Industrial Engineering in Mexico** to Petreleos Mexicanos employees. Pemex is one of the world's largest oil companies and is the only company in the Mexican oil market.

Working in partnership with Universidad La Salle in Mexico City, the program consists of courses traditionally offered at UH, but in condensed five-week sessions. Professors will travel to Mexico where they will spend one week lecturing students for 40 hours. The remaining four weeks of the course students spend completing homework assignments and projects. At the end of the program students will travel to UH to give a presentation on their work and participate in the Dec. 2002 commencement ceremony with the U.S. students.

Using an Internet interface program by Backboard.com, students and professors are able to maintain communication during the four weeks of independent study. According to Christine Ehlig-Economides, director of petroleum engineering, lectures and assignments are posted online and the students submit homework electronically as well. There is a discussion board where class members and the professor can interact electronically.

Hamid R. Parsaei, chair for the Department of Industrial Engineering, believes that this program will give his department an opportunity to build a strong academic relationship with their counterparts in Mexico.

"These outreach opportunities can create financial independence for the department," said Parsaei. "We plan to use part of the proceeds to create scholarships for graduate and undergraduate students."

## Only **Experienced Engineers** May Apply

Photo by Mark Lacy



Senior chemical engineering students Joey Stowers and Maricela Amador have received internship opportunities at Dow Chemical in LaPorte, Texas. They are pictured with Natasha Goode (left), senior engineer for Dow Chemical.

Experience required, the dreaded Catch—22 of every college graduate. How does a student get a job to get experience if the job requires experience? The UH Cullen College of Engineering has solved that problem with its Cooperative Education and Industrial Scholar Interns Programs. These programs are designed to give students the hands-on experience necessary to obtain a great job after graduation.

All UH students are eligible to sign up for the Cooperative Education program—a traditional internship program that does not offer course credit. Most co-op positions are offered on a full-time, alternating semester basis with two students filling each job. While one student works, the other attends school. They trade places each spring, summer and fall term.

ISIP is a new program that combines scholarships with job opportunities. Prior to the students' freshman year they begin the application process. Students are selected based on academic achievement and extra-curricular activities. ISIP, working with local industry partners, is involved with the students' progress from their freshman year until graduation. The program provides these students with four years of scholarship money and matches them with industry partners who sponsor the students' internship during their junior and senior year.

"ISIP has been there every step of the way for me," said Joey Stowers, senior chemical engineering student and ISIP intern at Dow Chemical. ISIP's career fairs and career development opportunities impressed Stowers. "The program helped match me with just the right company."

Maricela Amador, senior chemical engineering student and co-op intern, was very satisfied with how well structured the co-op program was at Dow Chemical. On her first day, they had engineering projects waiting for her.

"I got to see how it really is out in the industry," explained Amador. "You find out what you do and don't like, and that helps you choose a career path."

ISIP and co-op students are often hired full time after graduation by Dow Chemical, according to Natasha Goode, senior engineer for Dow Chemical.

"These students know the Dow culture, they know the work process and have a general idea of how we do business," explained Goode. "The more the students learn, the more comfortable they feel, and they can build relationships with the company. The students are more mature and open and they talk and show more initiative."

For more information about the Cooperative Education program, visit [www.egr.uh.edu/coop](http://www.egr.uh.edu/coop). ISIP information is available at [www.egr.uh.edu/isip](http://www.egr.uh.edu/isip).

## World's Top Deepwater Research Center Explores New Frontiers

By Alice Adams

World-class scientific exploration is nothing new for the UH Cullen College of Engineering, and pushing the envelope into new frontiers has become a common achievement. UH engineering researchers have taken the advanced composites technology that made it possible for man to rocket into space and are now developing materials to meet the same challenges miles below the sea.

As a result, composites technology has opened an entirely new frontier of subsea exploration and lightweight materials that are corrosion resistant leave as is superior in strength and fatigue resistance. It is also facilitating solutions to the international balance of trade and the continued prosperity of the free world.

The UH Composites Engineering and Applications Center for Petroleum Exploration and Production has taken a leading role in developing this new age technology and is recognized as the world's leading research organization in the engineering of composite material for offshore oil, gas exploration and production.

Established in 1994 as a joint initiative of U.S. oil companies, the U.S. Minerals Management Service and the U.S. Department of Energy, CEAC was nurtured by visionary university administrators, scientists and industrial leaders who believed composites could play a major role in deepwater production.

"CEAC's mission was extremely far-sighted," said Su Su Wang, director of the consortium and Distinguished University Professor of Mechanical Engineering. "We have, from the beginning, focused on new applications for polymeric composites in offshore and onshore operations where traditional materials have performance and economic limitations."

CEAC's consortium now works with more than 100 companies and government agencies, some of the world's top scientists and dozens of graduate researchers.

Momentum for composite materials research has been fueled by large deepwater discoveries coupled with high

production rate wells around the world. Deepwater interests now include the Gulf of Mexico, North Sea, the east coast of South America, west coast of Africa and the Far East.

"The materials aspect that composites offer—corrosion resistance, high strength and stiffness at a very light weight—is critical to deepwater operations," said Wang. "And because composite materials can be engineered to design specific structures, they can provide significant economic benefit."

Results of a recent industry study indicated 40 to 50 percent cost savings in deepwater exploration and production because of system weight and size reduction offered by composites.

"When you are dealing with platforms costing into the millions or even billions of dollars, a 40 to 50 percent savings becomes extremely significant," Wang pointed out. "And the scope of composites research now includes

topside platform structures—machinery, facilities and equipment—as well as subsea components—which translates into additional savings."

Current research applications for composites include construction of various platform structures, drill pipe, rigid and flexible risers and flow lines - pipes laid on the sea floor to transport production fluids from wellhead to storage facilities.

"We are seeing new systems, new configurations and ever-increasing water depths," he said. "As we journey further into this demanding new frontier, we will encounter even more challenges. Only our imagination constrains us."

Alice Adams is an award-winning writer and UH doctoral candidate. She has covered industry news for the *Houston Chronicle* since 1994 and continues to be an editorial supporter of the UH Cullen College of Engineering.

Photo by Mark Lacy



## MEET THE NEW ENGINEERING DEPARTMENT CHAIRS

CHANGE AND ADVANCEMENT ARE THE CORNERSTONES OF THE UH CULLEN COLLEGE OF ENGINEERING'S NEW ENERGY. AS PART OF THE PLAN TO REJUVENATE THE COLLEGE AND INCREASE OUR PLACE IN THE NATIONAL RANKINGS, A CHANGING OF THE GUARD HAS TAKEN PLACE AT THE COLLEGE. THE NEW DEPARTMENT CHAIRS ARE VANGUARDS IN THEIR FIELDS, AND THEY ARE READY TO TAKE THE REIGNS AND DIRECT THEIR DEPARTMENTS TO NEW AND PROSPEROUS GROUND. ➤

Lewis T. Wheeler, Kumaraswamy "Vipu" Vipulanandan, Michael P. Harold, Frank "Fritz" Claydon and Hamid Parsaei.

### Faculty Promotions

**Haluk Ogmen** (ECE) was promoted to professor.

**Christopher Chung** (IE) was promoted to associate professor with tenure.

**Ramanan Krishnamoorti** (ChE) was promoted to associate professor with tenure.

**Hanadi Rifai** (CEE) was promoted to associate professor with tenure.

### New Faculty

**Ji Chen** joined ECE as an assistant professor. Previously, he was the staff engineer with Motorola Personal Communications Sector and worked on several wireless communications projects. He received his Ph.D. from the University of Illinois.

**James Goodberlet** will join ECE in Jan. 2002 as an assistant professor. Previously, he was a research scientist in the Nano-Structures Laboratory at MIT, where he received his Ph.D.

**Reagan Herman** joined CEE as an assistant professor. She received her Ph.D. from the University of Texas at Austin. She will be teaching courses in materials engineering, structural theory, steel design and advanced steel design.

**Paul Ruchhoeft** joined ECE as an assistant professor. He received his Ph.D. from UH and was a research assistant professor for nanofabrication and spherical substrate lithography.

**Ardavan Asef-Vaziri** joined IE as an assistant professor. Previously, he was a visiting assistant professor of Operations and Supply Chain Management at the Marquette University College of Business Administration. He received his Ph.D. from the University of Toronto.

**Peter Vekilov** joined ChE as an associate professor. Previously, he was an assistant professor of chemistry at the University of Alabama in Huntsville, where he developed a program in protein crystallization. His addition strengthens the department's research in biochemical science and engineering. He received his Ph.D. from the Russian Academy of Sciences.

### Faculty Awards

**Fazle Hussain** (ME) was elected to the National Academy of Engineering. He also received the 2000 Fluids Engineering Award from the American Society of Mechanical Engineers and was named Fellow of the American Institute of Aeronautics and Astronautics.

**Vermuri Balakotaiah** (ChE) received the Ya. B. Zeldovich Award from Dow Chemical Company. He also received the college's 2001 Senior Faculty Research Award.

**Richard Barton** (ECE) received the Career Award from the National Science Foundation.

**Todd Helwig** (CEE) will receive the 2001 Collingwood Prize from the American Society of Civil Engineers in October along with his past student Tom Zhanfei Fan for their paper "Behavior of Steel Box Girders with Top Flange Bracing." He also received the 2001 Enron Teaching Excellence Award from UH as well as the college's 2001 W.T. Kittinger Award, the college's highest teaching award for outstanding teaching and service to engineering students.

**John Lienhard** (ME) received the Edwin F. Church Award from the American Society of Mechanical Engineers.

**Hanadi Rifai** (CEE) received the 2001 Wesley W. Horner Award from the American Society of Civil Engineers.

**Liang Shen** (ECE) received the Gold Medal for Technical Achievement Award from the Society of Professional Well Log Analysts.

**Richard Willson** (ChE) received the van Lanen Award from the American Chemical Society's Biochemical Technology Division. He was also elected president-elect of the International Society for Molecular Recognition.

**Raymond W. Flumerfelt** (ChE), UH Cullen College of Engineering dean, received the NASA Public Service Medal.

**David Jackson** (ECE) was named Distinguished Lecturer from the Institute of Electrical and Electronics Engineers' Antennas and Propagation Society.

**Stuart Long** (ECE), **David Wells** (IE) and **Donald Wilton** (ECE) received the Millennium Medal from the Institute of Electrical & Electronics Engineers.

**Gui Peng Luo** (ECE) received the Outstanding Performer Award from the Defense Advanced Research Project Agency.

MEET THE **NEW ENGINEERING DEPARTMENT CHAIRS**

» **FRANK “FRITZ” CLAYDON**, professor and chair for the **Department of Electrical and Computer Engineering**, joined the UH faculty Aug. 1999 after spending 12 years at the University of Memphis. Claydon’s educational interests revolve around programs to stimulate incoming engineering students. For the past 15 years, Claydon’s research focus has centered on cardiac mapping and mechanisms of defibrillation.

“My motivation as the new electrical and computer engineering chair is the opportunity to lead a department where preeminence is the stated goal,” said Claydon. “The potential of electrical and computer engineering is limited only by the commitment and creativity of its constituents.”

**MICHAEL P. HAROLD** is a professor and the Dow Chair for the **Department of Chemical Engineering**. Harold’s research expertise and interests are in chemical reaction engineering, with specific focus on reaction-separation devices, inorganic

membrane synthesis and applications, and catalytic and biocatalytic materials.

“I am delighted to return to my Ph.D. alma mater as chair of chemical engineering,” said Harold. “I look forward to leading the department to international prominence, building on its tradition of excellence. These are exciting and challenging times for the field of chemical engineering.”

**HAMID PARSAEI** is a professor and chair for the **Department of Industrial Engineering**. In addition to his obligations as a professor and the Gulf coast region director of the Texas Manufacturing Assistance Center, Parsaei is busy overseeing his numerous research projects, authoring research publications and holding leadership positions in many professional organizations.

“In assuming this leadership role in one of the fastest growing programs in the country, I intend to continue this growth and increase the position of distinction that

our program has already achieved,” said Parsaei. “Our goal is to provide outstanding educational and research opportunities in industrial engineering for students and organizations worldwide.”

**CUMARASWAMY “VIPU” VIPULANANDAN** is a professor and chair for the **Department of Civil & Environmental Engineering**. Vipu’s current research interests are in the geotechnical materials and geoenvironmental engineering. He has been principal investigator or co-principal investigator for 40 funded projects since 1984 amounting to more than \$4.5 million.

“My plans for improving the Department of Civil and Environmental Engineering include making the labs self sufficient through corporate endowments,” explained Vipu. “I also want to maintain a unique program that is flexible to meet the changing needs of students at an urban university and at the same time prepare them for a successful life-long career. By improving the labs and

increasing the number of students and faculty, I hope to gain national recognition for the program.”

**LEWIS T. WHEELER** is a professor and interim chair for the **Department of Mechanical Engineering**. Wheeler’s area of expertise is the mechanics of solids. Wheeler will serve as administrative leader of the department, directing the efforts of the faculty and staff to promote the department during this interim period.

“I believe that the mission of the Department of Mechanical Engineering is to provide an outstanding educational experience for students at all levels and to play a major role in the development of new and relevant knowledge for the profession,” said Wheeler. “Our commitment to this mission has brought us to a place of national prominence. To reach the next level, we need to maintain our traditional excellence, to move in new directions and to cultivate sponsors for scholarships, research fellowships, and facilities to support student projects.”

**Deborah Roberts** (CEE) received the BP Breakthrough Awards Special Commendation from BP Amoco.

**John Hunsucker** (IE) received the 2000 Safety Award from the World Waterpark Association.

**Richard Bannerot** (ME) received the Best Paper Award from the American Society of Engineering Education, Gulf Southwest Section.

**Nagaraja Shamsundar** (ME) received the Best Paper Award for Solar Pond from the American Society of Mechanical Engineers.

**Ted Cleveland** (CEE) received the Professional Service to Students Award from the American Society of Civil Engineers, Texas Section.

**John Glover** (ECE) received the Outstanding Engineering Educator from the Institute of Electrical & Electronics Engineers, Region 5.

**Su Su Wang** (ME) received the Offshore Technology Research Center Honors Award.

**Ron G. Chen** (ECE) was named honorary professor of the Central Queensland University of Australia.

**Yi-Lung Mo** (CEE) received the Research Creativity Award from the National Science Council, Taiwan.

**Michael O’Neill** (CEE) received the college’s 2001 Fluor Daniel Faculty Excellence Award, the highest faculty honor for a career of excellence in teaching, research and service.

**Dennis Clifford** (CEE) was awarded the UH 2000 Sigma Xi Faculty Research Award. He delivered the 2000 Sigma Xi Faculty Research Award Lecture Feb. 27, 2001.

**Ramanan Krishnamoorti** (ChE) received the 2001 Award for Excellence in Research and Scholarship from UH.

**Keith Hollingsworth** (ME) received the 2001 El Paso Teaching Excellence Award in Engineering.

**Martin Herbordt** (ECE) received the college’s 2001 Junior Faculty Research Award.

**Betty Barr** (ECE), **Karolos Grigoriadis** (ME), **Bill Rixey** (CEE), **Dave Shattuck** (ECE) and **Len Trombetta** (ECE) received the college’s 2001 Outstanding Teacher Awards.

**Mickey Fleisher** (ChE) and **Ahmed Nassef** (ME) received the college’s 2001 Outstanding Instructor Award.

**Mohamed Mansour** (CEE) received the college’s 2001 Outstanding Graduate Student Instructor Award.

#### Staff Awards

**Shirley Mate**, college’s academic advisor, received the 2001 George Magner Award for Excellence in Undergraduate Academic Advising from UH.

**Barbara Torres**, financial assistant for the Program for Mastery in Engineering Studies, received the 2001 Dean’s Meritorious Staff Service Award at the Cullen College of Engineering’s 2nd Annual Staff Appreciation Day. She received the award from peer nominations and recommendations.

#### Student Awards

**Yasser Qutub**, senior ChE, is the recipient of the 2000/2001 Southwest Chemical Association \$5,000 scholarship.

**Benjamin J. Fasenfest**, senior ECE, has received the \$1,000 IEEE Antennas and Propagation Society Undergraduate Scholarship for the 2001–2002 academic year.

**May Shek**, senior ChE, has been awarded a Tau Beta Pi Scholar Award. The scholarships are given based on scholarship, campus leadership and service, and promise of future contributions to the engineering profession.

**Ojas Zatakia**, **Ronny George** and **Sitaram Banda**, IE graduate students, received scholarships from the annual Logistics Education Foundation, making UH the only institution earning multiple honors. Winners of the award will be required to submit a research paper to *Logistics Spectrum*, the journal of the International Society of Logistics.

#### Key:

*ChE* — Department of Chemical Engineering  
*CEE* — Department of Civil & Environmental Engineering  
*ECE* — Department of Electrical & Computer Engineering  
*IE* — Department of Industrial Engineering  
*ME* — Department of Mechanical Engineering

# PURSUIT OF ORDER IN DISORDER



# EARNS PROFESSOR ELECTION TO **NAE**

More than three decades of research into understanding turbulence and developing methods for controlling and harnessing its potential earned Fazle Hussain, the University of Houston Cullen Distinguished Professor of Mechanical Engineering, election to the world renowned National Academy of Engineering.

Fazle Hussain is the latest UH Cullen College of Engineering faculty member to be elected to the National Academy of Engineering. He joins a handful of other UH professors—past and present—who have received this professional honor.

As the director of UH's Institute of Fluid Dynamics and Turbulence, he is considered one of the country's leading experts.

"He (Hussain) keeps his vision of research directions constantly regenerated by an intense process of communication and digestion," said John H. Lienhard, M.D. Anderson Emeritus Professor of Technology and Culture, at the ceremony honoring Hussain. "He is the great mixer and stirrer within the turbulence of the world wide turbulent-flow community. When Fazle writes a summary paper, the world reads it. Research directions are altered by it."

Hussain readily admits the mystery of turbulence isn't likely to be solved any time soon. However, through his Aerodynamics and Turbulence Laboratory at UH, he is constantly placing pieces in the puzzle while finding significant applications for what are seemingly narrow advances in the field.

"Turbulence is one of the most common and complex problems in natural sciences," Hussain said. "Virtually all fluid motion is turbulent, whether it is air moving around an airplane, water around the ship, fuel in an engine or blood in the heart."

The essence of Hussain's fundamental research in turbulence can be stated as the search for "order in disorder." He has conceived some organized features of random turbulence and called them "coherent structures" and has given conceptual and analytical framework for their understanding and interpretation through innovative measurement techniques and methodologies.

His laboratory is currently working on the following projects, which have economic potential: an internal combustion engine that operates without friction, holographic velocity measurements inside heart tissue and motor engines, emissions from vortex engines for power and propulsion, a metal diaphragm engine for micropower used for space and battle applications (engines that run nonstop) and power conducting directly from aluminum.

"This is an important personal honor for Dr. Hussain, but also an important honor for the University of Houston and the Department of Mechanical Engineering," said Raymond Flumerfelt, dean of the UH Cullen College of Engineering.



Fazle Hussain was honored by the college in May for his NAE membership. He is pictured with Dean Raymond Flumerfelt, June Smith and UH President Arthur Smith.



UH NAE members Benton Baugh, Dan Luss, Fazle Hussain and James Symons.

## National Academy of Engineering Members

**Neal R. Amundson**  
Chemical Engineering 1970

**Abraham E. Dukler**  
Chemical Engineering 1977

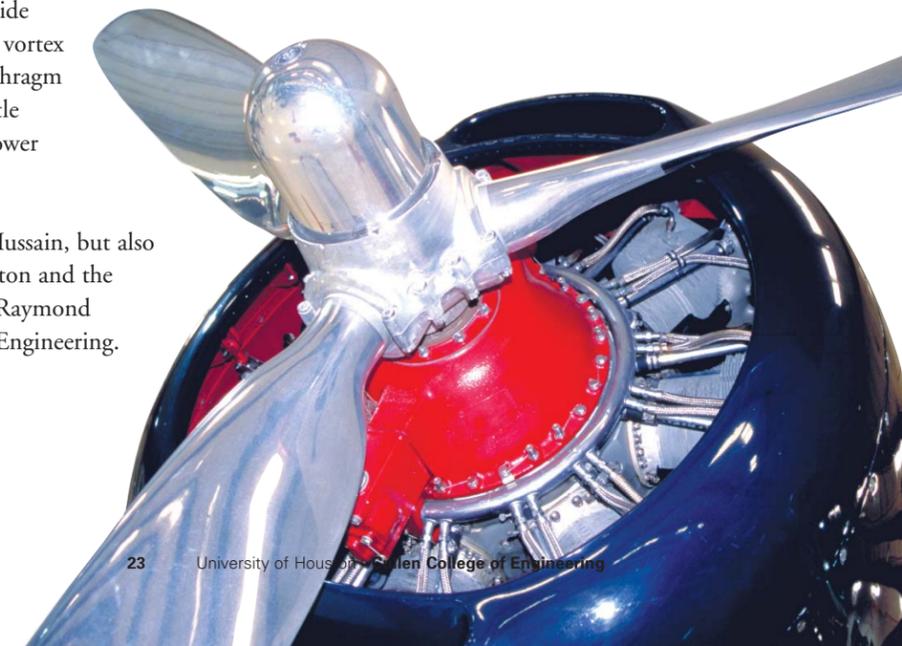
**Dan Luss**  
Chemical Engineering 1984

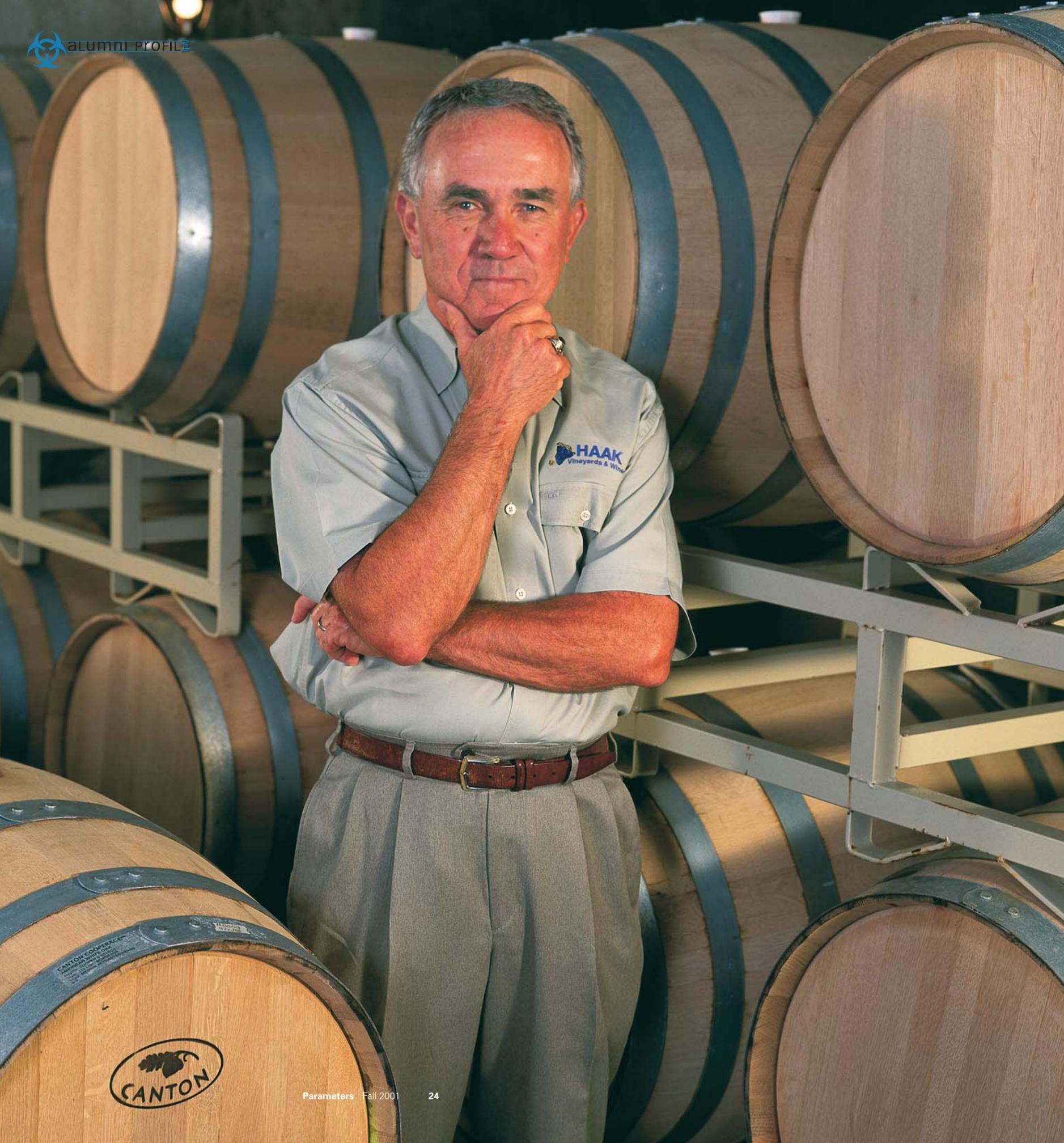
**James M. Symons**  
Civil & Environmental Engineering 1994

**Benton F. Baugh**  
Mechanical Engineering 1999

**Charles D. Cutler**  
Chemical Engineering 2000

**Fazle Hussain**  
Mechanical Engineering 2001





# ENGINEERING GOOD TASTE

By Carrie Ann Davis

Sunlight catches on the droplets of water sliding down the chilled glass of Chardonnay. As the glass is swirled, it is easy to notice the good legs on the wine, and once the glass is raised to the nose, the fruit and floral bouquet of this wine such as banana, honey, pineapple, mango, and pear are pleasantly satisfying. Finally, when the wine reaches the palate it is understandable why this is an award-winning Chardonnay.



How does a wine become this exceptional? Simple answer—engineering. Just ask Raymond Haak, owner and winemaker for Haak Vineyards and Winery located in Santa Fe, Texas. To him, winemaking is the merging of science and math with the creative arts.

Raymond is not a graduate from the Viticulture and Enology program at University of California-Davis; he is a 1969 electrical engineering graduate from the University of Houston.

“Most people do not know, and are not familiar with, what a technical process it is,” explains Raymond. “It is a very simple process, and yet it is very, very complicated. It is a paradox. Simple, meaning you can crush grapes and the grape skins have yeast on them naturally, and if you crush those grapes the yeast will start fermentation and it will make wine. Now whether that wine is great or it doesn’t oxidize or it doesn’t spoil has a lot to do with how you treat it and how you take care of it. Now we start getting into the winemaking process—the technical side of it.”

For Raymond, making commercial wine requires 1,500-gallon stainless-steel tanks, electronic pH meters, platinum RT sensors, crushing and juicing machines imported from Italy and electronic cooling systems. Maybe this is why a former instrument engineer feels so at home in his new occupation. In fact, he designed or adapted several of the instruments used in his fermentation lab based on his previous work experience.

Raymond’s resume is certainly diverse. His career ranges from having been an instruments engineer for Amoco Oil, an engineering contractor, a vice president of marketing and sales and an independent business owner of convenience stores and mini storage units.

“My wife used to think I could not hold down a job, because about every four or five years I was ready to move on,” laughed Raymond. “So I joke about the winery, this is what I want to be when I grow up. At 62 years old it has finally surfaced.”

Perhaps it was fate guiding the way, but all that job experience has really paid off for this entrepreneur. From the cultivation of the grapes to the marketing of his company, Raymond handles this business from the ground up.

While many people would shy away from a test of inner strength such as this, hard work and challenges are no deterrent to Raymond—in fact, they have a tendency to spur him on. It was this same determination that helped him graduate from UH. Gladys, his high school sweetheart and wife of 41 years, says he wore out three cars during his 11 years of working full time and attending night school. Raymond believes perseverance, commitment to where he is going and focusing on his long-term goals are what make him succeed.

The winery may be his biggest challenge to date. There is always some new and unforeseen task to tackle. Each new crop brings its own set of learning opportunities.

Raymond Haak, owner of Haak Vineyards and Winery, in his new wine cellar.



Raymond laughs at the idea of using feet to crush grapes. "That went out with Lucy. We're high tech. We don't use feet anymore."

"There is an expression 'out of the box'—a paradigm—I have been out of it so long," laughed Raymond. Winemaking is almost limitless, because every year you start out fresh with a new crop and it can be very different. The challenge is: what can I do this year that I didn't do last year?"

Raymond's engineering education at UH prepared him for managing the vineyard and winery. He says making wine is not complicated engineering, the engineering helps, but what is really needed is common sense. Working with percentages and weights, he is able to make the correct choices in adjusting the brix (sugar content) or the acid levels in his wine.

"Now that's not calculus... it is just common sense algebra and solution chemistry," explained Raymond. "But it (his education) has given me a maturity that makes me very comfortable and feel very good about those numbers and those calculations."

This maturity helps with all aspects of his business. Raymond not only grows the grapes and bottles the wine; he was also behind the design of the facility.

"I was virtually involved in all of it," explained Raymond. "I guess the way I approached that is—this is my last hoorah. I didn't want to wait until it was built and wish that I had done this differently or that differently." He designed the aesthetics of the facility, along with all the technical specifications and had an architectural designer make the final prints.

One of the most amazing things about the winery is the cellar. Santa Fe, which is located on the Texas Gulf Coast, is at sea level making the construction

of a cellar a logistics problem. The answer came in the form of a quick lube and oil change business that opened near the winery. This quick lube has a basement area where the technicians work. Raymond hired that contractor to build his cellar.

The contractor installed a French drainage system. A French drain is plastic perforated pipe that is buried in a trench lower than the cellar floor extending around the perimeter of the cellar wall. All the ground water leaks into perforated pipe that is designed to slope to one low point. A vertical pipe with a sump pump is located at that low point. The pump is running 24 hours a day removing the water table beside the cellar wall. If that pump stopped working, there would immediately be water seeping into the cellar.

Before the wine can even make it to the cellar it must be grown and cultivated. Tending a vineyard requires innovative techniques, a careful eye and the patience of loving and nurturing parents. Haak Vineyards grows Black Spanish and Blanc du Bois grapes. These particular grapes have a unique property to them; these vines are able to withstand Pierce's Disease. This disease, which is a bacterium spread by insects, is found along aquatic areas and has cost the Texas wine industry millions of dollars during the past 25 years.

If Pierce's Disease was not challenge enough, there are a slew of other problems to be dealt with on a daily basis. Fungus, birds, rain and pestilence are always attempting to encroach on the vineyard. Running a facility like this is a non-stop project.

"Gladys and I both love to travel, but since we opened the winery we shut that down," said Raymond. "We just can't get away. We went away for a day or two to New Orleans, but we just couldn't rest. We leave and we know there is nobody else doing what we do. So we had to come back. We

spent the first night; she woke up the next morning and said let's get back on the plane. We saw and did everything we were going to do there in one day, and we came back."

Even though the vineyard is a lot of work, the Haak's know they are fortunate. All the grapes are picked by hand late in the summer, so harvesting grapes is hot and labor intensive. But when it comes time to harvest, many friends and neighbors come out to help. As one of the volunteers pointed out—the wine is so good it is worth the effort.

Most winemakers will tell you wine is made in the vineyard, but the winemaker's job is not finished after the harvest. The winemaker is the caretaker of the wine and a great deal of work is necessary before the wine is ready to be bottled. Each batch of grapes is unique in its challenges—or as Raymond sees it—learning experiences.

While Raymond can control his harvest, he also receives grapes from California and other parts of Texas to be processed into wine. Last year, the winery processed 36 tons of grapes from outside sources; this year that number will increase to 55 tons. Sometimes these imported grapes are too ripe or under ripe and technology must step in and set things right. According to Raymond, volatile acidity, better known as vinegar, is a common problem. Another problem is when the brick levels are out of balance. This is where Raymond's experience in chemistry plays an important role. There are many ways to balance the acids and brix such as the blending of wines, reverse osmosis machines and adjusting pH levels. Raymond said he gets satisfaction taking grapes that are not quite right and making them into really great wines.

Haak Vineyard and Winery submitted their

house. It just intrigued me all of a sudden. I thought it would be fun to make homemade wine and grow grapes. I thought, 'Wow, 30 vines is great—300 would be even better.' That's the kind of fanatic I am.

"I asked Dr. George Ray McEachern, one of the foremost grape-growing experts in the state about planting vinifera. He said 'No it will never grow

Chardonnay to the Finger Lakes International Wine Competition earlier this year and walked away with a bronze medal.

"I am a perfectionist and I would have liked gold, but I will take bronze," joked Raymond. "But there were more than 900 wines in that competition. So if you think about it—our wine could be lost in the background noise or in the shuffle. So for our short name to be recognized and to win a medal I was real pleased."

It helps to have top of the line equipment to work through the rough spots. The facility is equipped with four 1,500-gallon tanks, one 2,000-gallon tank and one 3,000-gallon tank. Wine fermentation is exothermic; therefore, temperature control is an essential element to good winemaking. Around the outside of each tank there is a hollow shell heat exchanger and a five-ton chill glycol unit cooling a tank of propylene glycol. Raymond can set the temperature however he needs to properly ferment the wine.

Raymond is always looking for opportunities to improve his winemaking. He has designed some equipment to help automate some tasks. For example, an ultrasonic meter checks liquid levels in the tanks. He has also modified many pieces of his standard equipment to run in a more efficient manner.

Raymond is happy about his facility's progress. The winery has only been open for eight months and five of his six tanks are full and he has already sold more than half of last year's production. According to his business plan, the winery should increase production to 5,000 cases of wine by the third year and expand the current facility to 10,000 feet.

Considering the winery is in a unique market area, this is not an unreasonable plan. A half-million gallons of wine is consumed within a 60-minute radius of the winery, according to statistics from the Wine Institute at Texas Tech University. As Raymond says—that's a lot of wine.

"I like to think about my life—and everybody's life is the same way—but it is becoming more real to me," said Raymond. "It is the most exciting journey I have ever been on. I have had some great trips along the way, great occupations, great learning experiences, and it is almost a little spooky that the various jobs I have had seem to have lead me to where I am now."

Raymond extends an invitation to all UH alumni to come out and visit the winery for a tour and wine tasting. For more information about Haak Vineyard and Winery, visit [www.haakwine.com](http://www.haakwine.com).



### Engineering to Winemaking?

This is a question Raymond and Gladys are asked often. Raymond claims it is Gladys's fault.

"She brought two little grapevine plants home from the nursery 26 years ago," starts Raymond. He enjoys teasing his wife good-naturedly about it. "She said, 'Here plant these.' So, I did. I went out along the flower garden beside the house and planted them.

"Well low and behold they just took off and they were so beautiful and green and I thought, 'Wow that is neat.' They made some grapes the first year. Of course, I found out later you are not supposed to let them make grapes the first year. But they made a few clusters of grapes and I thought, 'That's great!'

"The very next year I went out and bought 28 or 30 new vines and made a little vineyard beside the

there.' Well that was the worst thing he could have told me—I rushed out and bought 150 vinifera just to prove him wrong. They lived for seven years, but they all died exactly like he said they would from Pierce's Disease. So then I replaced them with some varieties that would survive. I grew that vineyard and made grapes from it and wine for probably 18 years in that one spot—close to 20 years."



..... 1960'S .....



**TIM PEASE** (1960 MSCE) was inducted into the Offshore Energy Center Hall of Fame in 1998. He is a retired senior vice president of Sonat Offshore Drilling.

**HORST J. PAUL** (1965 BSEE, 1967 MSIE) owns Horst J. Paul & Associates, Inc., a Houston-based manufacturing systems software company with a client base of oil tools, pumps, electronics and sign manufacturing companies. He can be reached at horst@hjp.com.

**ROD CANION** (1966 BSEE, 1967 MSE), former CEO of Compaq Computer and chairman of Questia Media, was one of several Houstonians recognized by the Texas eComm Association for his contributions to the state's Internet economy.

**FRANK S. MARINO** (1967 BSCE) is vice president of Turner Collie Inc. He directs the project planning and execution of public works and industrial infrastructure projects.

**SYL TURICCHI** (1968 BSChE) is senior manager of the Center for Chemical Process Safety, an American Institute of Chemical Engineers Industry Technology Alliance. Previously, he worked for Union Carbide for 32 years. He retired as senior general manager of Plants, OPTIMAL, a UCC joint venture with Petronas, the National Petroleum Company of Malaysia. He can be reached at sylt@aiche.org.

..... 1970'S .....

**C. RICK CONEWAY** (1973 BSCE, 1976 MSCE) is senior vice president of the Department of Defense Services for Informatics Corporation in Richland, Washington. Colonel Coneway retired from the U.S. Air Force Reserve after 31 years of commissioned service. He was also named the 2000 Engineer of the Year from the Texas Society of Professional Engineers. Rick can be reached at itrickconeway@earthlink.net.

**STEVE HAZLEWOOD** (1975 BSEE) joined the government affairs team at The Dow Chemical Company's Texas Operation, where he will initially focus on relationships with local elected officials and taxing authorities and address the public policy needs of the new Dow locations in Texas.

**TERRY HUDGENS** (1976 BSCE) is senior vice president of Power Supply of PacifiCorp in Portland, OR. Hudgens is responsible for the company's Power Generation, Wholesale Sales and Mining businesses.

**MARCELYN BOONE** (1979 BSME) is the manager of technology and manufacturing development at Ameripol Synpol in Port Neches, Texas.

**HERNAN ESCALANTE JR.** (1979 BSEE) is president of Brewer & Escalante Associates, Inc., a Houston-based consulting engineering firm. Previously, he served as vice president and secretary of the company and as president and owner of Escalante Engineering. Hernan can be reached at hescalante@brewer-escalante.com.

**TERRY SWIFT** (1979 BSChE) is chief executive officer and president of Swift Energy International, an independent oil and gas company engaged in the exploration, development, acquisition and operation of oil and gas properties, with a focus on onshore natural gas reserves in the U.S. and onshore oil and natural gas reserves in New Zealand. He is the son of A. Earl Swift and represents the fourth generation of the Swift family in the oil and gas industry.

..... 1980'S .....

**MARTIN NARENDORF** (1982 BSEE) was named Spring Branch service area manager for Reliant Energy HL&P/Entex, where he will oversee planning and scheduling operations of 80 employees serving about 120,000 customers. He has 17 years experience with Reliant Energy HL&P supplying efficient solutions to customers' energy supply needs.



**BONNIE DUNBAR** (1983 PhD) received the James I. Mueller Memorial Award in 2000 from the American Ceramics Society for her long-term service to the division and significant impact on ceramic engineering. She was also one of only five women in the world in 2000 inducted into the Women in Technology International Hall of Fame. That same year, Bonnie was also elected as one of the top 20 women in technology in Houston. She has logged over 1,208 hours (50 days) in space as a mission specialist during missions in 1985, 1990 and 1995, and as payload commander in 1992 and 1998. She is an accomplished private pilot. Bonnie serves as assistant director for university research and affairs at the NASA Johnson Space

Center. In this position, she is the focal point for JSC's educational and grant programs, and collaborative efforts with colleges, universities, and scientific and engineering organizations.

**ARUP K. SENGUPTA** (1984 PhD) is a professor and chair of the Department of Civil and Environmental Engineering at Lehigh University located in Bethlehem, PA. He can be reached at arup.sengupta@lehigh.edu.

**LISA (EILAND) HOLMESLY** (1985 BSEE) and **ROBERT MCCORMICK** (1985 BSME), as International Space Station operations planners, coordinated NASA's Space Shuttle flight to ISS between Houston and Moscow, and were assisted by **JOSEPH KITCHEN** (1991 BS Math, 1998 MS Math) and **Samantha Nichols** (UH student), as real time planning engineers. UH grads supported each of the three shifts.

**MICHAEL McDAVID** (1986 BSME) was awarded a patent (#5,971,837) for a barrel-shaped abrasive blasting cabinet. He is the president of Lake Buchanan Industries, Inc. and can be reached at lbi@tstar.net.

**KURT SMITH** (1986 BSME, 1992 MBA) is the

integrated team manager of thermal systems for NASA Shuttle and Space Station Integration.

**JOHN S. GROUNDS III** (1987 MSCE, 1988 PhD) was the 2001 volunteer chairman for the Houston Marathon. Since his sister Laura died of breast cancer in 1990, he has raised money for the American Cancer Society by running in the Houston Marathon.

..... 1990'S .....

**EARL REYNOLDS** (1993 MSPetroE) was named senior vice president of operations Aug. 18, 2000 for Ocean International, Ltd., a subsidiary of Ocean Energy, Inc. Previously, he spent 10 years for Burlington Resources in a variety of operational and management positions, including director and general manager in London, England and general manager of acquisitions and international ventures.

**E. NATHAN HARRIS** (1995 BSME) won first place for best paper presentation for "Design and Testing of Multifunctional Structure Concept for Spacecraft" at the 41st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference in Atlanta.

## ALUMNI NEWS BRIEFS

### Chemical & Petroleum Engineering Reunion



C.V. KIRKPATRICK

A reunion for Chemical and Petroleum Engineering alumni will be held Saturday, Nov. 17 at the UH Hilton Hotel. The luncheon program will honor C.V. Kirkpatrick, UH professor and petroleum engineering chair from 1947-63 and UH engineering dean from 1963-75. A block of rooms at the UH Hilton are available by making reservations at 1-800-HOTELUH or 713-743-2471. For more information, contact Michelle Stevenson-Shaw at 713-743-4201, e-mail msteve@uh.edu, or visit [www.egr.uh.edu](http://www.egr.uh.edu).

### Alumni Judge Science & Engineering Fair

The Engineering Alumni Association sent a team of alumni, graduate students and friends to judge the 2001 Science and Engineering Fair of Houston March 23. The team awarded gift certificates as prizes to the first, second and third place winners in the senior (senior high), ninth grade and junior (middle school) categories. The alumni judging team, organized by Linda Pechacek

(1985 BSCE, 1993 MSCE), included Michael Lacy (1985 BSCE), Jason Little, Ron Lohec (1955 BSME), Tim Nedwed (1992 MSChE, 1996 PhD), Shrikanth J. Reddy (1996 MSEnvE), Sabrina Sweeney (1997 MSEnvE) and Imran Vehra (1997 BSIE).

### Engineering Learning Leading Fund

Did you know that alumni participation in the annual fund is a key factor used in national college rankings? The success of the UH Cullen College of Engineering depends on alumni support and this year's goals are to increase the number of alumni who make a gift and to raise \$75,000 for the annual fund. Every gift to the Engineering Learning Leading Fund provides the flexibility to meet current needs for state of the art equipment, information technology, reference books and journals, internships and faculty research.

This fall, a UH student will be calling to ask for your support. Consider making a gift to ensure that the best education and research is offered at the college. For more information, contact the UH Learning Leading Fund at 1-877-755-0559 or visit [www.uh.edu/development](http://www.uh.edu/development).



### EAA Chosen As Top Association—Get Involved!

The Engineering Alumni Association received the 2000 Outstanding Association of the Year Award by the Houston Alumni Organization last fall. This is the second time EAA received this award for the activities they provide their members, including networking opportunities through the Distinguished Engineering Alumni Awards Dinner, Cajun Crawfish Boil, golf tournament, Homecoming festivities, tailgating and annual meeting. EAA



Engineering Alumni Association board of directors at the Annual Meeting on August 9 were (front row) Yvonne Garcia (1997 BSME), Trent Slovak (1983 BSCE), Barbara McNew (1996 BSCE), and Ray Scheliga (1979 BSME), (second row) Bill Fendley (1971 BSCE), Michael Chastant (1998 BSChE), Bob Woodward (1997 BSIE), incoming president Dale Rudick (1991 BSCE), Daniel Wong (1985 MSCE, 1988 PhD), Billy Cooke (1978 BSCE) and Imran Vehra (1999 MSCSE).

members have the opportunity to keep in touch with their classmates, network with professionals who share a common background, attend student and alumni socials and support the UH Cullen College of Engineering through scholarships and student organization sponsorships.

Are you interested in taking a more active role with the Engineering Alumni Association? Volunteers are needed throughout the year to help with a variety of activities. To get involved, visit [www.egr.uh.edu/alumni](http://www.egr.uh.edu/alumni), e-mail [alumni@egr.uh.edu](mailto:alumni@egr.uh.edu), or call 713-743-4200.

### College Produces Alumni Directory

The UH Cullen College of Engineering alumni directory is scheduled to be released in November. This comprehensive new volume is a compilation of the most current data available on over 11,600 alumni records. All alumni who reserved a copy of the directory during the verification phase of the project should be receiving their copies two or three weeks after the release. If you have a question on your order or if you wish to place an order, contact Bernard C. Harris Publishing Co., Inc. via e-mail at [inquiry@bcharrispub.com](mailto:inquiry@bcharrispub.com) or call 1-800-877-6554.

He is a senior mechanical design engineer for Lockheed Martin, where he designs spacecraft in a group called Flight Systems. He has worked on six spacecraft, including Deep Space 1 and the Mars Polar Lander.

**TAMERA BARRY** (1997 BSME) is pursuing an MBA at the University of Michigan. She can be reached at tamerabarry@mediaone.net.

**SCOTT R. ELMER** (1997 BSCE) was named the 2001 Young Engineer of the Year by the Texas Society of Professional Engineers-Houston chapter. He is the city engineer for the City of Missouri City, Texas.

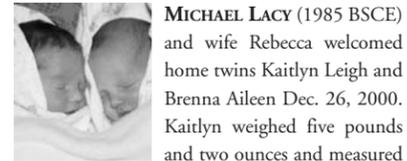
**ATHENA WAI MAN DU** (1998 BSIE) is an industrial project engineer for Haggar Clothing Company in Dallas, Texas. She can be reached at athena.waimandu@haggar.com.

**IMRAN VEHRA** (1999 MSCSE) is an electrical engineer for Halliburton, where he worked when he was a co-op student at UH (when it was SperrySum). He can be reached at ivehra@hotmail.com.

..... **MARRIAGES** .....

**TIM BROWN** (1997 BSChE) married Michelle Devor on June 3, 2000 at St. Mary's Catholic Church in League City, Texas. Tim is a process engineer for BP.

..... **BIRTHS** .....



**MICHAEL LACY** (1985 BSCE) and wife Rebecca welcomed home twins Kaitlyn Leigh and Brenna Aileen Dec. 26, 2000. Kaitlyn weighed five pounds and two ounces and measured 18.25 inches long. Brenna weighed four pounds and 11 ounces and measured 18.25 inches long. Mike is the vice president of Cobourn, Linseisen & Ratcliff.

**KENNETH M. MERCADO** (1985 BSEE, 1991 MSIE) and wife Jill welcomed home Corinne Kristen Mercado Nov. 16, 1999. She weighed seven pounds and 13 ounces and measured 19.5 inches long. Kenneth is manager of the Magnolia Park Service Center for Reliant Energy. He can be reached at kenneth.mercado@reliantenergy.com.



**DAVID HIGGINS** (1986 BSCE, 1995 MSCE) and wife Alma welcomed home Eva Rae Higgins Sept. 14, 2000. She weighed seven pounds and two ounces. David is a structural specialist for Burt-Kleinpeter, Inc. and can be reached at dhiggins@bkusa.com.



**KEVIN LEE SELF** (1991 BSEE) and wife Elizabeth Lee welcomed home their first child Joshua Lee Oct. 8, 1999. He weighed seven pounds and nine ounces. Almost two years old now, Joshua is already disassembling things and losing the pieces; a true engineer in the making! Kevin is a senior applications engineer for Dallas Semiconductor and can be reached at myself@airmail.net.

**JIM BEST** (1993 BSEE) and wife, Cheryl (Hungate) Best, welcomed home their first child, Jacob Evan Best, July 24, 2000. Jim is a manager of network planning. He can be reached at cjbest@flash.net.

**KURT T. BUSH** (1995 BSME) and wife Debbie welcomed home their first child, Taro Kurt, May 23, 2000. He weighed nine pounds and five ounces and measured 21 inches long. Kurt is a research engineer with Schlumberger and can be reached at ktbush@ev1.net.

**SHANNON G. SHERBERT** (2000 MSCompE) and wife Jessica welcomed home their first child, LeAnn Elizabeth, Feb. 27, 2000. She weighed six pounds and 15.75 ounces and measured 20 inches long. Shannon is a software systems engineer with Compaq Computer Corporation and can be reached at ssherbe@llc.net.

..... **DEATHS** .....

**EDWIN P. MUELLER, JR.** (1959 BSEE) died Feb. 23, 2000. He was a design assurance engineer for Motorola.

**DAVE CALVIN CASS** (1966 BSEE) died April 22, 2000. He retired April 1, 2000 after 33 years with Texas Instruments/Raytheon.

..... **CLASS NOTES** .....

Send us your alumni news about new jobs, promotions, honors, moves, marriages, births, etc. Attach additional news clips or photos separately. Please include a self-addressed stamped envelope if you want your photos returned.

All Class Notes should be sent to:

**Parameters Magazine, UH Cullen College of Engineering  
E316 Engineering Bldg 2, Houston, TX 77204-4009**

E-mail [parameters@egr.uh.edu](mailto:parameters@egr.uh.edu) or visit [www.egr.uh.edu/parameters](http://www.egr.uh.edu/parameters)

Name \_\_\_\_\_

Degree(s)/Major(s) \_\_\_\_\_ Class Year(s) \_\_\_\_\_

Day Phone \_\_\_\_\_

E-Mail Address \_\_\_\_\_

Permission to print my e-mail address with my Class Note.

News \_\_\_\_\_

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ALUMNI NEWS BRIEFS



Vita Como, Greg Williams (1979 BSME), UH Engineering Dean Raymond Flumerfelt, Gary Hurta (1972 BSME) and Fred Davila (1990 BSME).

Cajun Crawfish Boil

A record 5,000 people enjoyed crawfish, barbecue and live Zydeco music at the 13th Annual ASME/UH Cajun Crawfish Boil on April 29 on the UH campus. The American Society of Mechanical Engineers presented a \$50,000 check to Raymond Flumerfelt, dean of the UH Cullen College of Engineering, from the proceeds from this year's event that will benefit UH engineering scholarships and academic programs. The Cajun Crawfish Boil was the kickoff event for the Offshore Technology Conference. Guests enjoyed 10,200 pounds of crawfish, 1,100 pounds of barbecue and



Mark your calendars for the 14th Annual ASME/UH Cajun Crawfish Boil May 5, 2002.



UH mechanical engineering students receive scholarships at the ASME/UH Cajun Crawfish Boil. Scholarship recipients included Joseph Beagle, Jason Berrio, Marc Bitoun, Kenneth Flakes, Enedelia Franco, Sandra Geffert, Monte Jones, Nerisa Kershaw, Zachary Leutwyler, Tu Nguyen, Paul Northam and Brian Sidle.

40 kegs of beer. They also danced to live Zydeco music and many walked away with prizes from the raffle drawings. Children enjoyed the moonwalk, games and face painting. The 14th Annual ASME/UH Cajun Crawfish Boil will be Sunday, May 5, 2002 at Lynn Eusan Park on the UH campus.

Annual Golf Tournament

About 140 golfers helped raise money to support the UH Cullen College of Engineering at the 12th Annual Engineering Golf Tournament April 2 at Hearthstone Country Club. Bill Fendley (1971 BSCE) was honorary chair of the tournament.



Electrical and computer engineering professors Martin Herbordt, Stuart Long, Fritz Claydon and Jeffery Williams.



Low Gross Winners were Joe DePaula, Larry Witte, J.C. Ethridge and Norm Bond.



Low Net Winners were Sam Kennedy, Tom Outlaw, Robert DeShurley and Tommy Glazier.

# { Distinguished Alumni Awards } 2001 Recipients



David Higgins, Michael Lacy, Dave Shattuck, Charles Beyer and Ravi Singhania

*The University of Houston Engineering Alumni Association gathered Friday, June 1 to recognize alumni, faculty and friends of the UH Cullen College of Engineering for significant contributions to society and the profession.*

## Distinguished Engineering Alumnus Awards



**Charles Beyer** (1972CE, 1977 MSCE) is an active 25-year member of the Association of General Contractors. Charles served three tenures on the board of directors for the Houston Contractors Association, where he served as president in 1997. He is a 20-year member of the Houston Engineering and Scientific Society, where he served on the board of directors and is the current president. Charles has worked on the Construction Specification Writing Committees for the City of Houston and Harris County.

In 1992, Charles started his own construction company, Beyer Construction, Inc., which constructs projects for the City of Houston and surrounding cities in the greater Houston metropolitan area, Harris County, METRO and private developers.

Beyer Construction was one of the founding sponsors of the UH Cullen College of Engineering's Industrial Scholar Interns Program and continues to be actively involved as an intern employer and member of the steering committee. Charles has been a sponsor and participant in the college's golf tournament since its inception.

The Distinguished Engineering Alumni Awards were established to recognize and honor alumni who have made significant contributions to society and whose accomplishments and careers have brought credit to the UH Cullen College of Engineering. Portraits of the honorees are displayed in the Hall of Distinction in Engineering Building D.



**Ravi Singhania** (PhD ChE) is vice president and general manager of one of BASF Corporation's integrated manufacturing sites in NAFTA located in Freeport, Texas. He has initiated and led the successful reengineering

efforts and oversees the BASF Corporation Manufacturing and Site Managers Community.

As a community leader, Ravi has chaired several organizations including, the Brazosport Chamber of Commerce, Texas Chemical Council, Brazosport Center for Arts and Sciences, Junior Achievement and the Brazoria County Petrochemical Producers Council. He is also the past director of the Brazosport Rotary Club and founding director of Brazosport Safetytown.

In support of education, Ravi serves on the Brazosport College Board of Regents, Leadership Advisory Board of the UH Cullen College of Engineering and visiting committee for the University of Texas Chemical Engineering. He is an advisory member for Texas A&M University Chemical Engineering.

Ravi has been recognized as the Brazosport Outstanding Man of the Year and the 2000 Father of Texas Award. Last year, he was inducted into the Junior Achievement Business Hall of Fame.

## Distinguished Young Engineering Alumnus Award



**David Higgins** (1986 BSCE, 1995 MSCE) began his engineering career with the U.S. Army Corps of Engineers in the Fort Worth District. He held positions with Brown & Root, Bechtel and Kvaerner. David is currently employed at Burk-Kleinpeter as a structural specialist. He has worked in several industries including military facilities buildings, petrochemical, chemical, pulp & paper, pharmaceutical, mining & metals, offshore and transportation. David has been a professional member of American Society of Civil Engineers for 14 years.

He received his Professional Engineering License in 1993 from the State of Texas. He has been an active eight-year member of the Structural Engineers Association of Texas Houston/Gulf

*The Honorable Mayor Lee P. Brown was this year's keynote speaker at the Distinguished Engineering Alumni Awards Dinner at the Four Seasons Hotel in Downtown Houston.*



Photos by Phil Busby

UH Engineering Dean Raymond Flumerfelt, Houston Mayor Lee D. Brown and former Engineering Alumni Association President Trent Slovak

Coast Chapter, where he is president. David is also on the building committee for All Saints Church in the Heights.

In 1982, he enrolled at the University of Houston. He served as president of the ASCE student chapter and Chi Epsilon, the civil engineering national honor society. He worked for two semesters as a teaching assistant for the engineering graphics classes and six semesters as a proctor for the engineering computer classes. David was a member of the Kingwood Volunteer Fire Department and taught an advanced life-saving course for the American Red Cross.

The Distinguished Young Engineering Alumni Awards were established to recognize and honor young alumni (40 years old and younger) who have made significant contributions to society and whose accomplishments and careers have brought credit to the UH Cullen College of Engineering.

## Roger Eichhorn Leadership Service Award



**Michael Lacy** (1985 BSCE) began his association with the Engineering Alumni Association in 1990 when he was elected to its board of directors. He served on various committees and as the student constituent representative for the civil engineering student group that helped organize the student volleyball matches for the annual EAA Homecomings and the awards banquet. Since 1994, Michael has coordinated EAA's ticket reservations and skybox arrangements for UH football games. Michael became EAA president in 1996.

As vice president of education for the American Society of Civil Engineers, Michael has helped organize student tours of the Offshore Technology Conference for approximately 350 high school students. He is also chair of the National ASCE Student Activities Committee for the conference in October, serves with the Texas Section ASCE Committee on Student

Activities, and has helped judge concrete canoe and steel bridge competitions for 12 years. Last year, Michael was honored for his long service to ASCE with the Texas Section ASCE Professional Service to Students Award.

Michael is vice president of municipal engineering for Cobourn, Linseisen & Ratcliff, Inc.

The Roger Eichhorn Leadership Service Awards were established to recognize and honor an individual who has consistently and voluntarily given extraordinary support to the UH Cullen College of Engineering. The awards are named in honor of former dean of the college, Roger Eichhorn.

## Abraham E. Dukler Distinguished Engineering Faculty Award



**Dave Shattuck** joined UH in 1982 as an assistant professor in the Department of Electrical Engineering and adopted the nickname "Dr. Dave." He began teaching courses in electronics, circuit analysis, microprocessors and communication theory. He led the group that transformed the course in circuit analysis, significantly raising the standards for this entry-level course in the electrical engineering curriculum, and introducing challenging technical writing assignments. He continued his work on medical ultrasonics and began doing research in the well-logging field. In this oil-field application, he worked on physical modeling of well-logging tools such as induction-logging tools, electrode-based resistivity tools and through-casing resistivity tools. He was promoted to associate professor in 1989 and became associate dean of undergraduate programs in 1992.

He has received the Houston Alumni Organization's Outstanding Faculty Award, Enron Teaching Excellence Award, college's Outstanding Teacher Award, IEEE/HKN Outstanding Teacher Award, ECE Faculty Slide Rule Champion, UH George Magner Faculty Advisor Award, UH Faculty Three-Point Shooting Champion, college's W.T. Kittinger Outstanding Teacher Award and Outstanding Educator of the Mortar Board National Honor Society.

The Abraham E. Dukler Distinguished Engineering Faculty Awards were established to recognize and honor UH Cullen College of Engineering faculty who have made significant contributions to society and whose accomplishments and careers have brought credit to the UH Cullen College of Engineering. The award is named in honor of Abraham E. Dukler, former dean of the college.

## Energy in Flight Students Face Challenge of Recording Experiment in Zero-G Flights

By Steve Boss



Photos Courtesy of Johnson Space Center

A team of students from the UH Cullen College of Engineering got a chance to make their mark on technology that could be used aboard the International Space Station or during a Mars mission as they conducted zero-gravity experiments in NASA's so-called "Vomit Comet" March 1-2.

Moses Navarro, Jainik Shah, Brian Stalcup and Oscar G. Herdocia flew aboard a KC-135A aircraft out of Ellington Field as part of NASA's Reduced Gravity Student Flight Opportunities Program. The young scholars are part of a team of seven UH students, supervised by Professor of Mechanical Engineering David Zimmerman, who have developed the ZGrMM—or Zero Gravity Machinery Monitoring experiment.

The objective of the experiment was to develop a database of zero gravity machinery 'fault' signatures that can be used to gauge whether a piece of equipment aboard a spacecraft might be failing or faltering.

"We want to see if there's a difference in how a machinery's vibrations are measured in zero-g and on the ground in one-g," explained Zimmerman. "While it's possible to predict when maintenance will be needed for machinery on a spacecraft based on tests on earth, the situation may be different in zero-gravity."

The experimental test-bed consists of a rotating machine, along with necessary signal conditioning and data recording devices. The simulator allows for the rapid introduction of several faults, including rotating imbalance, shaft misalignment, gear box failures and bent shafts.

The UH crew is one of 48 teams of college students from around the country carrying out experiments aboard the NASA aircraft this year. The reduced gravity environment is obtained using a specially modified transport jet, which flies roller coaster-like parabolic arcs over the Gulf of Mexico to produce weightless periods of 20-25 seconds. The aircraft will make two- to three-hour flights, performing about 30 parabolas.

In addition to the students who got to fly aboard the NASA aircraft to operate ZgraMM, ground team members included engineering students Ruben Morin, Brian Sidle and Jason Berrio.

"This really offers a once in a lifetime educational opportunity for most of these students," said Zimmerman. "While it gives them a unique perspective on the science and engineering involved in the space program, they get some valuable lessons in planning and organizing and what real-life engineering projects require in terms of safety, responsibilities, time and resources."



### 2001

#### July 13–October 10

##### "Monuments, Mills & Missile Sites: 30 Years of HAER"

*Historic American Engineering Record (HAER) traveling exhibit visits UH.*

Open M–F, 9 a.m.–4 p.m.

Gerald D. Hines College of Architecture, Entrance 18

#### Second Thursday of each month

##### Engineering Alumni Association Board Meetings

5:45 p.m.

Dean's Conference Room (E421 Engineering Bldg 2)

#### September 26

##### NSBE's 26th Annual Career Fair

*The National Society of Black Engineer's job fair is for participating company representatives to meet UH students majoring in engineering and related fields, including computer science, mathematics, physics, business, technical, as well as non-technical disciplines. To include your company, contact Curll Dowden at 713-743-4236.*

9 a.m.–3 p.m.

University Center, Entrance One

#### September 26

##### Beginning of Semester Party

*Sponsored by the Cullen College of Engineering, student organizations and EAA.*

3–7 p.m.

Between Engineering Bldg 1 and Y Bldg

#### October 20

##### Homecoming: UH vs. Cincinnati

*For tickets, call the Athletic Ticket Office at 713-743-9444.*

5 p.m. tailgate, 7 p.m. kickoff

West side of Robertson Stadium

#### October 26

##### 16th Annual Chemical Engineering

##### Graduate Student Symposium

*Presentations include catalysis, polymers, reaction engineering, biochemical engineering, enhanced oil recovery and computer-aided process engineering. Contact Luigi Saputelli at 713-743-4335 or e-mail [saputelli@uh.edu](mailto:saputelli@uh.edu).*

### November 1

##### Electrical & Computer Engineering Alumni Reunion

*Hors d'oeuvres, cash bar, parking available for \$2 per car in the Hilton garage. RSVP by Oct. 22 to 713-743-4440 or e-mail [ecersvp@egr.uh.edu](mailto:ecersvp@egr.uh.edu).*

6–8 p.m.

UH Hilton Hotel, UH campus

### November 17

##### Chemical & Petroleum Engineering Alumni Reunion

*Honoring C.V. Kirkpatrick, UH Petroleum Engineering Professor and Chair 1947–63, Engineering Dean 1963–75.*

11 a.m. – 1 p.m.

UH Hilton Hotel, UH campus

(7 p.m. UH vs. UAB @ Robertson Stadium)

### December 14

##### Cullen College of Engineering Graduation Ceremony

Cullen Performance Hall, UH campus

### 2002

#### April 1

##### 13th Annual Engineering Golf Tournament

12:30 p.m. shotgun start

Hearthstone Country Club

#### May 5

##### 14th Annual ASME/UH Cajun Crawfish Boil

1–5 p.m.

Lynn Eusan Park, UH campus

#### May 10

##### UH Graduation Ceremony

#### June 14

##### Distinguished Engineering Alumni Awards Dinner

Four Seasons Hotel, Downtown Houston

#### August 8

##### EAA Annual Meeting

6 p.m.

Athletics/Alumni Center, UH campus

For more information about any of these activities or upcoming events, call 713-743-4200, e-mail [alumni@egr.uh.edu](mailto:alumni@egr.uh.edu), or visit [www.egr.uh.edu/events](http://www.egr.uh.edu/events).



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**Cullen College of Engineering**

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