A Message from President Renu Khator

In recent years, the University of Houston has identified energy as a key strategic focus for research and education. We have challenged UH Energy and the Energy Research Park to build a premier research and education facility for students and faculty, as well as establish a unique environment for the best minds to create new business approaches to challenges in the way energy is created, delivered and used. The development of the next generation of petroleum engineers and the first in the nation subsea engineering program demonstrate how UH has answered this challenge.

The UH Energy Initiative is bringing together the university’s top energy-related faculty, researchers and students from across campus to pursue the highest and broadest level of energy research, including fossil fuels, biofuels, wind, solar, transmission, storage, policy and business practices.

Our faculty and students, undergraduate and graduate, are working on a truly remarkable scope of projects and achieving incredible things that prove our university’s vital role in the future of our nation and the world. I am delighted that the UH Energy Connections newsletter will help showcase those achievements and the people making them possible.

Energy Symposium Series Continues Second Season

The first two debates in the 2014-2015 UH Energy Symposium Series focusing on critical issues in energy took place before capacity crowds on September 30 and November 11 at the new University Center theater. The topics were US Energy Independence: Good For The Nation? and America’s Energy Infrastructure: Is It Safe?

Speakers at the first debate included Edward Chow, senior fellow in the Energy and National Security Program at the Center for Strategic and International Studies; Ed Hirs, managing director of Hillhouse Resources, LLC and an energy economist at University of Houston; and Jane Kleeb, founder and executive director of Bold Nebraska, a political action group active in the fight against the Keystone XL pipeline.

Speakers at the second debate were Charles Esser, analyst at the International Energy Agency; Carl Weimer, executive director of the national Pipeline Safety Trust; and Steve Magness, principal of Cogent Energy.

Presented by Chevron, the popular energy symposium series, which began last year, will deliver two more debates on important energy topics in Spring 2015. The next debate topic is Private Profit vs. Public Good: Do Energy Companies Have a Social Responsibility? and will take place on Tuesday, February 10, 2015. The final topic for the series is Our Next Energy Workforce: Where Will It Come From? will be held on Tuesday, March 31, 2015.

To RSVP for the next debate: www.uhenergyseries.eventbrite.com

For more information on the debate series: uh.edu/uh-energy/features/symposium-series

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Upcoming Energy Workforce Workshop Series

ASSESSMENT OF STEM HIGHER EDUCATION
January 21, 2015 at 5:30 – 7:00 p.m.
Speakers: Mark Schneider, American Institutes for Research and Wallace Dominey, University of Houston
Location: M.D. Anderson Library, Rockwell Pavilion

INNOVATION IN EDUCATION AND ITS RELEVANCE TO THE ENERGY WORKFORCE
March 10, 2015 at 5:30 – 7:00 p.m.
Innovation in education policy and practice to meet the workforce needs
Location: M.D. Anderson Library, Rockwell Pavilion

RSVP to uhenergyrsvp@uh.edu
For more information, visit uh.edu/uh-energy/features/energy-workshop-series/
(Light refreshments will be served; Free to the public)
Excerpted from “The Power Arrangers”  
By Jeannie Kever

Research in Superconducting Wire and Solar Materials Show Why UH Is ‘The Energy University’

Programs in petroleum and subsea engineering reinforce the University’s traditional emphasis on conventional forms of energy, but when U.S. Energy Secretary Ernest Moniz toured the UH National Wind Energy Center, the Superconductor Pilot Manufacturing facility and the Energy Device Fabrication Laboratory, he predicted innovations in superconductivity and renewable energy will be increasingly important. “Hydrocarbons still will play a huge role. So will nuclear. But,” he added, “so will wind and so will solar.”

That’s especially big news at UH, where some of the nation’s top players in solar and superconductivity are engaged in powerful research.

Venkat Selvamanickam, who earned his Ph.D. at UH in the early 1990s, is a prime example. He has returned as a successful researcher and entrepreneur. “Selva,” as he’s known, develops advanced processing techniques for high-performance materials for energy and electronic applications, including high-temperature superconducting thin film tapes, thin film photovoltaics and flexible electronics. Selva, who in 2000 co-founded SuperPower to manufacture superconducting ribbon, has also led the development of technologies to convert that ceramic superconductor into a flexible wire with 300 times the current-carrying capacity of a comparably sized copper wire.

So too Alex Freundlich, who has spent the past two decades researching high-efficiency solar energy materials and devices here. He arrived on sabbatical from his native France and was kept at UH by the remarkable opportunities. A pioneer in the field of quantum and nano-architected photovoltaics—a method of generating electrical power by using semiconductors to convert sunlight into direct current electricity—Freundlich develops technologies to make solar power more efficient and more economically feasible.

Superconductivity has been one of the cornerstones of scientific research at UH since 1987, when physicist Paul Chu and colleagues discovered a compound that acted as superconductor—a material that could carry energy without any loss due to resistance—at a relatively high temperature. Superconductors that can function at such temperatures make commercialization a realizable goal.

To promote the development of commercially viable superconductors, The Texas Legislature founded the Texas Center for Superconductivity at UH, launching a new era of research. Since then, the promise of superconductivity has loomed large for energy applications, because as much as 10 percent of the electricity produced by any source is lost during the transmission between the generating plant and your home or business.

Students benefit from the research, too. Freundlich’s lab is part of the Quantum Energy and Sustainable Solar Technologies Engineering Research Center, an 11-university global consortium sponsored by the National Science Foundation and the Department of Energy, spearheaded by Arizona State University. Students have the opportunity to work in the labs of partner schools, as well as to participate in outreach efforts, including pushing for more public awareness of solar energy.

Together, these three research leaders reflect the considerable breadth of energy-related research at UH, The Energy University. A version of this article originally appeared in the Spring 2014 edition of UH Research & Innovation magazine. It can be read in its entirety at www.uh.edu/research/news/magazine/.

H. DAVID RAMM
Chairman
UH Energy Advisory Board
Managing Partner
Dymar Development LLC
Chairman and CEO
BrightSource Energy, Inc.

David Ramm brings significant and varied experience in general management, energy technology and infrastructure development to his role as chairman of the UH Energy Initiative Board of Advisors.

The advisory board, which meets three times per year, provides strategic guidance, reputation, external coordination, and industry fundraising for UH’s energy initiative. The advisory board will also help staff advisory sub-committees to aid the university in developing actionable plans in the areas of education, research and technology incubation.

Ramm currently serves as the managing partner of Dymar Development LLC, a Houston-based energy development and consulting company, and chairman and CEO of BrightSource Energy, an Oakland, California-based corporation that designs, builds, finances, and operates utility-scale solar power plants. Ramm commutes between Houston, Oakland, and Tel Aviv. In 2008, Greentech Media ranked BrightSource as one of the top 10 greentech startups in the world.

In 2002, Ramm co-founded DKRW Energy, LLC, an energy infrastructure development company. He previously served as president, CEO and director of Integrated Electrical Services, president of Enron Wind Corporation, and managing director of Enron Renewable Energy Corporation.

Ramm co-founded and currently serves as a director of BlueRock Energy, a Syracuse, New York-based electricity and natural gas commodity provider. He is a member of the External Advisory Committee for the U.S. Department of Energy’s National Renewable Energy Laboratory.

Ramm holds an M.S. in management from the Sloan School at MIT, an M.B.A. from Long Island University’s Roth School of Business and a B.S. in mechanical engineering from the United States Military Academy at West Point.

Energy Advisory Board Directs Energy Initiative

Underscoring her commitment to make the University of Houston the “go-to partner” for energy-related research, innovation and solutions, President Renu Khator has named 24 global industry leaders to the UH Energy Advisory Board. “Our board is made up of acknowledged leaders in the fields of energy development, management and implementation,” Khator said. “UH is poised to become ‘The Energy University’ and the guidance of our board members in achieving that goal is invaluable.”

The advisory board will provide strategic guidance, reputation, external coordination, and industry fundraising for UH’s energy initiative. The advisory board will also help staff advisory sub-committees to help the university develop actionable plans in the areas of education, research and technology incubation. For more information in the Energy Advisory Board, visit: http://www.uh.edu/uh-energy/about-uh-energy/advisory-board/.
Rockwell Career Center Serves Students and Energy Employers

Known as “The Energy Capital of the World,” Houston offers UH students unmatched job opportunities across a wide variety of energy-related careers.

At the C. T. Bauer College of Business, students learn the business of energy through a portfolio of course offerings that is unmatched. At both the graduate and undergraduate levels, students have the opportunity to learn about energy implications in finance, management, marketing, supply chain, accounting, technology and economics.

Bauer College’s Global Energy Management Institute (GEMI) serves as a resource to prepare and support the energy works of today while exploring issues important to the industry’s future, with curriculum for degree programs, as well as professional networking opportunities through forums, seminars and symposia.

Bauer also focuses on connecting students to energy careers with its dedicated career center, the Rockwell Career Center (RCC), which serves both Bauer students and potential employers. Through its free, online service at hirebauer.com, the RCC posts jobs and schedules interviews for companies seeking qualified business students and graduates.

In this facilitator role, the RCC also complements Bauer students’ academic experiences with career development programs designed to lead them to successful and fulfilling careers. In doing so, RCC increases the value of Bauer to the business community in Houston and around the world.

Bauer College’s Office of Development works alongside RCC’s energy industry placement programs, actively engaging the community through alumni and corporate relations, development, advancement and specific special events, including the Distinguished Leaders Series, an event showcasing Houston’s energy leaders.

For information on events and programs, contact the Bauer College Office of Development at 713-743-4626 or bauer@uh.edu.

Superconductivity Researcher and Entrepreneur

Dr. Venkat Selvamanickam, also known as “Selva,” conducts research that spans a wide range of advanced processing techniques for high-performance materials for energy applications, such as superconductors, photovoltaics, flexible electronics, and solid-state lighting.

As he explains, “The primary area of our expertise is high-temperature superconducting materials for energy applications such as high-power wind generators, high-capacity power transmission cables and magnetic energy storage systems.” Recently, Selva’s team extended the roll-to-roll manufacturing process developed for thin film superconductor tapes to demonstrate single-crystalline-like GaAs, germanium, and silicon on flexible metal as well as on glass substrates. These unique structures are being developed for high-efficiency, low-cost III-V thin film photovoltaics, high-performance flexible electronics, and large area, flexible inorganic light emitting diodes (LED).

Strong industrial partnerships are a hallmark of the program. The team is currently working on superconductor technology development with SuperPower, Inc. in four, federally-funded projects. Selva’s research is also now extending beyond the UH campus into the University’s Energy Research Park where a 13,000 sq. ft. facility has been established for an Energy Devices Fabrication Laboratory.

The team currently consists of 30 members and, looking to the opportunities ahead, they are seeking more graduate research assistants, research scientists and research faculty with compatible expertise and interest to join the group and experience the stimulating research environment and world-class facilities.

Researching Sleep to Make Energy Operations Safer

As the search for hydrocarbons goes farther and deeper, the financial and safety risks of exploration and production continue to increase. To better understand and help industry manage these risks, the UH Center for Applied Psychological Research (CAPR) conducts research to enhance the effectiveness of technical training and personnel safety in the oil and gas industry.

In the safety domain, CAPR research has shown that although employee personality, work load, and safety culture can impact safety performance, employees’ sleep patterns may impact safety performance at least as much as the factors that are most commonly addressed through safety interventions. In a recent paper, they show what organizations can do to mitigate the negative impact of lack of sleep on safety outcomes.

Through collaborative research projects with industry partners, CAPR has identified how and when technical training solutions need to be supplemented with non-technical content, and how cross-cultural differences need to be accounted for in technical training systems. Through a number of research projects, CAPR has also demonstrated which characteristics of mentoring programs can facilitate accelerated technical development.

CAPR research systems are centered on a quantitative/measurement approach to generating guidelines and recommendations. In assessing the effectiveness of organizations’ technical development solutions, they investigate how employees’ characteristics and technical backgrounds interact with their organizations’ support for training systems.

The CAPR research team consists of five to eight graduate students and Christiane Spitzmueller, an associate professor in the Department of Psychology. Over the past years, the CAPR team has collaborated with organizations such as BP, ExxonMobil, Saudi Aramco, Willbros, INGAA and Convergent Performance.

The UH Center for Applied Psychological Research is just one reason the University of Houston maintains its leadership role in Houston, “The Energy Capital of the World.”
Student Spotlight

Originally from Harker Heights, Texas, Kyrie Ruiz received her BA in Finance at UH and will graduate in May 2015 with her Juris Doctor degree. She is the Notes and Comments editor on the Houston Law Review, a member of the Student Bar Association, a 1L Mentor, was a semi-finalist in the Newhouse Mediation Competition, and has interned with Vinson & Elkins for the past two summers. When not occupied with her studies, she enjoys traveling with family and friends and exploring Houston.

How did UH open doors for you?

I think it has a lot to do with the professors that we have here. Many of them have either worked in the industry or have practiced for so long that they have many connections. Many of my connections for opening doors also came through a program that the Law Center is involved in – LCLD (Leadership Council and Legal Diversity). That really helped, because they pair you with mentors who work in the industry from day one. My first year I was connected to a partner at Vinson and Elkins, and obviously I worked hard so that when I had good grades I could show them to him and he could pass my résumé along internally.

UH was able to open doors into the energy industry - because it is right in the middle of it. I’ve got huge law firms at our back door who constantly visit the Law Center, and a lot of them graduated from here. That is a big door opener.

Are there any professors in particular that really stand out for you?

I would say Professor Zachary Bray (assistant professor of law); I was an RA for him. He is wonderful, very open if I ever have anything I want to talk to him about, and always just willing to listen if there’s some issue going on.

How did UH give you an advantage when interning?

Well, it goes back to the classes and a lot of the classes taught by adjunct faculty that I’ve taken, because they focused on practicing law in the energy industry. That really helps when I’m trying to understand a client’s business because I understand how to think about the legal aspects for their particular business. That’s the biggest thing that’s given me a leg up in terms of interning and impressing attorneys and clients, the fact that I can understand their business from a legal perspective as well as from the industry perspective.

What are your defining/unique moments at UH?

In my first semester as a 1L in law school, I participated in a negotiation competition with a fellow classmate, Pierce Cox. We had no real clue about law or negotiation, but we worked hard, had fun and ended up making it to the finals, much to our surprise. We did lose to a team of 3L students in the final round, but in that moment I remembered realizing how much I truly loved the law and that as 1Ls we had a natural ability to negotiate. That was truly a defining and unique moment for me at UH. In the stress of all of 1L, the experience was a blast and I learned that I had the potential to do very well in the field I was about to enter into.

Kyrie has been offered a job at Vinson & Elkins starting in October 2015 when she graduates.

A Message from the UH Energy Chief Energy Officer

“With this newsletter, we begin a communications outreach to our UH family of students and educators on not just the University’s energy-related curriculum, programs, news and events, but the people behind those programs, the impact they have on our students’ futures, and how they resonate within Houston’s incredibly vibrant energy business community. We welcome your interest and feedback in making our communications efforts of interest and value.”

Ramanan Krishnamoorti, Ph.D. has held the position of chief energy officer at the University of Houston since February 2013, leading the university’s efforts to establish energy-centered partnerships on an industry and university level to address the world’s most pressing energy challenges.

Event Calendar

1/21/15  Assessment of Stem Higher Education
M.D. Anderson Library, Rockwell Pavilion, 5:30 – 7:00 p.m.
Speakers: Mark Schneider of American Institutes for Research and Wallace Dominey, University of Houston
Please RSVP to uhenergysvp@uh.edu. For more information, visit uh.edu/uh-energy/features/energy-workshop-series/

2/10/15  Private Profit vs. Public Good: Do Energy Companies Have a Social Responsibility?
University Center Theater, 5:30 - 7:00 p.m. Reception following.
Please RSVP to uhenergyseries.eventbrite.com
For more information, visit uh.edu/uh-energy/features/symposium-series/

3/10/15  Innovation In Education and Its Relevance to the Energy Workforce
M.D. Anderson Library, Rockwell Pavilion, 5:30 – 7:00 p.m.
Please RSVP to uhenergysvp@uh.edu. For more information, visit uh.edu/uh-energy/features/energy-workshop-series/

(All events are free to the public)

For more information about UH Energy programs, news and events, visit: uh.edu/energy