

SPRING 2012

UTAH ENGINEERING

Dr. David W. Pershing

NAMED NEW PRESIDENT OF THE UNIVERSITY OF UTAH

Former Dean of Engineering and a Distinguished Professor of Chemical Engineering Selected to Take the Lead

The State Board of Regents has selected Dr. David W. Pershing as the 15th President of the University of Utah. Pershing, who was formerly the Senior Vice President for Academic Affairs of the University of Utah, succeeds Dr. Michael K. Young who left in 2011 after accepting the Presidency at the University of Washington, and Dr. Lorris Betz, who served as Interim President.

A 20-member Presidential Search Committee narrowed the search to two finalists, who were announced in January. Working with a search firm, the committee considered more than 80 potential candidates and recommended Pershing as a finalist after an in-depth screening process and several days of comprehensive interviews.

Pershing is a Distinguished Professor of Chemical Engineering who has spent the last 14 years in a leadership role at the University of Utah helping the U navigate a challenging economic climate for higher education by finding innovative ways to fund growth and drive academic excellence. A gifted teacher and prolific researcher, Pershing is the recipient of both the Distinguished Teaching and Distinguished Research Awards and the Rosenblatt Prize for Excellence. >>



"I am honored to have the opportunity to lead the University of Utah into its next growth phase."

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Pershing has authored more than 80 peer-reviewed publications, won more than 20 research grants totaling approximately \$60 million, and earned five patents. He was named Engineering Educator of the Year by the Utah Engineering Council in 2002 and is a winner of the Governor's Medal for Science and Technology. He was director of the University of Utah's Center for the Simulation of Accidental Fires and Explosions, fueled by a \$40 million grant from the U.S. Department of Energy.



"I am honored to have the opportunity to lead the University of Utah into its next growth phase," said Pershing. "When I arrived at the U three decades ago my sole ambition was to become an effective teacher in the

Chemical Engineering Department. I never dreamed that I would be given so many wonderful opportunities — to teach bright, inquisitive students, pursue exciting research and, in my most recent role overseeing academic affairs, help shape the remarkable trajectory of this institution. Now I am eager to work with our superb faculty, deans, cabinet, trustees and staff to accelerate our efforts. I am committed to ensuring that the U sustains its focus on academic excellence, outstanding health care, and cutting edge scholarship and research, while finding innovative ways to support our amazing students and maximize our economic contribution to the state of Utah."

Pershing joined the University of Utah as an Assistant Professor in Chemical Engineering in 1977. He was named a Presidential Young Investigator by the National Science Foundation in 1984 and became Dean of the College of Engineering in 1987. He holds a bachelor's degree from Purdue University and a Ph.D. from the University of Arizona, both in Chemical Engineering.

The University of Utah is the flagship institution of the Utah System of Higher Education. Founded in 1850, it is the first and largest public higher education institution in Utah, with more than 31,000 students and a campus comprising almost 1,500 acres in the eastern foothills of Salt Lake City. A major academic and research institution with an extensive health sciences center, the university offers majors in 72 subjects at the undergraduate level and more than 90 major fields of study at the graduate level, including law and medicine.

Holly Braithwaite, *director of communications, Utah System of Higher Education*

TECHNOLOGY COMMERCIALIZATION AT THE

The University of Utah is first in the nation at starting companies based on university research for the second year in a row, according to an annual survey recently released by the Association of University Technology Managers (AUTM). The survey ranks U.S. universities and institutions on commercialization success, and in recent years, the U of U has climbed to the top, overtaking such schools as MIT, Columbia, Cal Tech and Johns Hopkins. The newest survey measures fiscal year 2010. The U of U had 18 startups (seven that originated in the U's College of Engineering) from July 1, 2009 to June 30, 2010, while MIT was second, with 17 new companies. Other top schools included Brigham Young University with 13, Columbia and Cornell with 12, Johns Hopkins and Purdue at 11 each, while Cal Tech, Carnegie Mellon University and the University of Michigan all had 10.

"This achievement is again a testament not only to our world-class researchers and their innovative discoveries, but also to the university's unique ability to deliver that life-changing technology to the people who need it most," says A. Lorris Betz, M.D., former interim president and former senior vice president of health sciences for the University of Utah. "In addition, the companies we produce give our community a much-needed economic boost, create jobs and grow Utah's reputation as an innovations hub in the nation and world."

The U of U created the Technology Venture Development office in 2005 to coordinate all commercialization efforts across campus. Since then, the university has consistently ranked among the best in the country and, for the last five years, it has been one of the top two for startups. Before becoming the No. 1 university last year based on results from fiscal year 2009, the University was second for two years in fiscal years 2006 and 2007, and tied for first in 2008.

Announcing the Peter and Catherine Meldrum ENDOWED PROFESSORSHIP IN CHEMICAL ENGINEERING

The University of Utah College of Engineering with the Department of Chemical Engineering is pleased to announce the Peter D. and Catherine R. Meldrum Endowed Professorship in Chemical Engineering. The professorship is being funded through a generous donation from the Meldrum Foundation, and will be used to attract an outstanding new faculty member for the department.



awarded the Governor's Medal for Science and Technology in 1998 and received the Mountain West Venture's Entrepreneur of the Year Award in 2001. He received a Doctor of Engineering degree (honorary) from the University of Utah in 2009; a Doctor of Science degree (honorary) from Westminster College in 2004; and an M.B.A. in 1974 and

a B.S. degree in Chemical Engineering in 1970, both from the U of U.

"The Peter D. and Catherine R. Meldrum Endowed Professorship will add prestige and distinction to the college, while honoring the contributions of a distinguished alumnus and pioneering scientist," says Engineering Dean Richard Brown.

Peter Meldrum is the president and chief executive officer of Myriad Genetics, Inc., a publicly-traded molecular diagnostic company. Myriad, which was founded by Meldrum, focuses on the development of new predictive medicine and personalized medicine products that save and improve the quality of lives for patients around the world.

Meldrum was selected by Scientific American as one of the Top 50 Scientific Visionaries in the World and is a member of its Thinkbank. He formerly served as a member of the College's Engineering National Advisory Council. Meldrum was

Catherine Meldrum attended the University of Utah, graduating with a B.S. in Elementary Education. She taught elementary and preschool for about 10 years, and became deeply involved in P.E.O., an international Philanthropic Educators Organization, which raises money for scholarships and grants to women. She also has served on the U of U's College of Education Advisory Board and currently serves on the Westminster College Women's Board.

The Meldrums are deeply involved across campus and in the community, including Pioneer Theater Company, Ballet West and Westminster College, among others. Their philanthropy has improved lives, advanced the arts and sciences, and helped causes throughout the community.

U of Utah Repeats as #1 University for Startups

Since the U of U launched its first startup, TerraTek, in 1970, it has followed up with more than 200 other startups based on research: 125 of these were founded in the past six years after the university restructured its commercialization efforts. According to the university's Bureau of Economic and Business Research 2010 economic impact study, U startups directly or indirectly accounted for 15,767 jobs, \$754.5 million in personal income and \$76.6 million in tax revenue in 2009.

In total, the 2010 AUTM survey reports information collected from 183 institutions across the U.S. — 155 universities, 27 hospitals and research institutions, and one third-party management company. Those institutions created 651 startup companies, or an average of four startups per institution.



Short Solutions was started at the university by an electrical and computer engineering student team.

New Building for Discovery and Innovation

NOW COMPLETE: THE JAMES L. SORENSON MOLECULAR BIOTECHNOLOGY BUILDING
– A USTAR INNOVATION CENTER

The April 2012 dedication of the “James L. Sorenson Molecular Biotechnology Building—A USTAR Innovation Center” marks the beginning of a new era of interdisciplinary translational research at the University of Utah. It is the centerpiece of a visionary plan to bridge the U of U main campus and health sciences in order to accelerate research at the interfaces of medicine, engineering, pharmacy, science, business, law and digital media.

In 2006, the state of Utah passed a new measure designed to facilitate research and technology commercialization in an effort to strengthen Utah’s “knowledge economy” and generate high-paying jobs. The resulting Utah Science Technology and Research (USTAR) Initiative supports economic development in Utah by providing funding to Utah’s research universities to support the creation of fundamental technologies with the potential to encourage the growth of major industries in Utah.

USTAR funds help to recruit world-class faculty with proven track records of research and commercialization. The University of Utah currently has 33 USTAR faculty in key research areas. One important area of innovation at the U of U is the new state-of-the-art interdisciplinary building that will foster groundbreaking research.

“The James L. Sorenson Molecular Biotechnology Building—A USTAR Innovation Center is the first building in the new multi-disciplinary research province that will link the western and eastern portions of the campus,” says Thomas Parks, University of Utah’s vice president for research. “We expect that the excellent facilities will draw faculty and student researchers to collaborate on problems that are at the intersection of materials science, engineering and biomedical science.”

A Nexus for Global-Leading Interdisciplinary Work

With an emphasis on technology innovation that turns into companies and jobs, the 208,000-square-foot building will be home to the Brain Institute, the Nano Institute and the Department of Bioengineering, along with USTAR faculty researchers supported by graduates students, post-docs, junior faculty, administrative and laboratory personnel.

The unique design of the building allows for open laboratory space and for researchers to share equipment and facilities. The building contains extensive wet labs, and research computing space, faculty office space, meeting rooms and public areas designed to promote interaction within the scientific community. >>



“The design of the facility will encourage collaboration among the various disciplines,” says Richard Brown, dean of the College of Engineering. “It puts us among a select group of universities with the ability to develop the most advanced tools and will provide opportunities for us to compete for big multidisciplinary federal programs that will not only fund cutting-edge research but also enhance our visibility.”

John White, director of the Brain Institute, says the USTAR building will aid basic neuroscience research focused on improving treatments for neurological and psychiatric disorders, and brain and spinal cord injuries.

“The point of the Brain Institute is to generate cross-disciplinary research,” he says. “In this building, we are well-positioned to bring diverse teams from engineering and medicine together to generate new ideas.”

A State-of-the-Art Nanofabrication Facility

The new building also includes a state-of-the-art nanofabrication facility. Nanotechnology drives innovation in such fields as energy, medicine, communications and computing. With 18,000 square feet of cleanroom space, a biobay, and a 5,300-square-foot microscopy and materials characterization suite, the new Utah Nanofab is positioned to become a national nanotechnology center by forming industry, state and university partnerships that promote economic development and create advancements in research.

“The USTAR building with its unique combination of engineering/nanofabrication, physiology and analysis facilities and capabilities is a nexus for globally leading interdisciplinary work on the interface of the most pressing healthcare and engineering challenges of our time,” says Florian Solzbacher, associate professor of electrical and computer engineering and director of the Utah Nanofab.

“Nanotechnology can enable personalized healthcare, pharma and device research,” he says. “However the nanotechnology potential can only be effective in a setting where engineering researchers and scientists jointly and concurrently define and address challenges. This requires facilities where teams from all disciplines work side-by-side on the same or similar problems in the same environment. The USTAR building and new facilities enable just that.”



The Utah Nanofab currently leverages \$83 million in federal funding for active research projects and services 45 Utah companies located from St. George to Logan, Utah.

Architects for the USTAR building were Lord, Aeck & Sargent, with Prescott Muir. Layton Construction was the construction manager. The building was designed to meet LEED Gold standards for energy efficiency from the U.S. Green Building Council and is on track for certification pending final review.

The project was funded through a \$100-million commitment from the state of Utah through the USTAR Initiative, with \$30 million in non-state and private funds, including the cornerstone gift of \$15 million from the Sorenson Legacy Foundation, \$1.25 million from the Micron Technology Foundation and private gifts from Dinesh and Kalpana Patel and Jon Huntsman, Sr., among others.

The Sorenson Legacy Foundation's gift has been recognized with the naming of the building as the James L. Sorenson Molecular Biotechnology Building—A USTAR Innovation Center, honoring one of the nation's foremost biomedical innovators. A gifted inventor and entrepreneur, James Levoy Sorenson developed the first disposable paper surgical mask and an industry-changing heart monitoring system.

Engineer Captures Starry Skies and Majestic Landscapes

To Bret Webster, photography is more than just a part-time passion. Educated as an engineer, Webster's venture into photography started a few years ago as recreation but became something he was driven to do as he became more skilled.

Prior to his photography interest, Webster attended the University of Utah, graduating with a B.S. in

chemical engineering in 1984. "I was particularly drawn to chemical engineering because it seemed to be such a versatile degree," he says. "I thought you could do just about anything with it."

For the next 28 years, he spent his career working in the rocket/missile industry, first for Hercules Aerospace and then as a solid fuel propellant and explosives specialist for aerospace and defense technology company Northrop Grumman. He also worked for TRW. Today Webster continues

to work for Northrop Grumman as an executive managing special projects that provide rockets to the Air Force, Missile Defense Agency and NASA.

It wasn't until a few years ago that Webster discovered a talent for photography almost by accident. When he borrowed his wife's new digital camera, he was amazed at the great pictures he could take with it.

A resident of Utah, Webster began photographing the places he had explored his whole life. Many of the images depict Utah's arches and red rock landscapes set against starry night skies.

All of his images are single-exposure photographs that do not involve Photoshop. Webster leaves the shutter on the camera open while he lights up the rocks with spotlights.

"As I learned more about photography and was able to apply more creativity to these pictures, it became increasingly satisfying," he says.

Others have starting taking note and now his work is appearing all over the world, including on NASA's Astronomy Picture of the Day Website and in the U.S. Embassy in Kuwait. A 20-foot display in the Natural History Museum of Utah shows his photo of the Ghost Panel rock art in Canyonlands National Park at night.

"I never planned on it becoming a business but it has become that and is quite demanding on my time," he says. "Fortunately I enjoy all aspects of it." >>



NEWS BRIEFS

UTAH LEGISLATURE SUPPORTS HIGHER EDUCATION

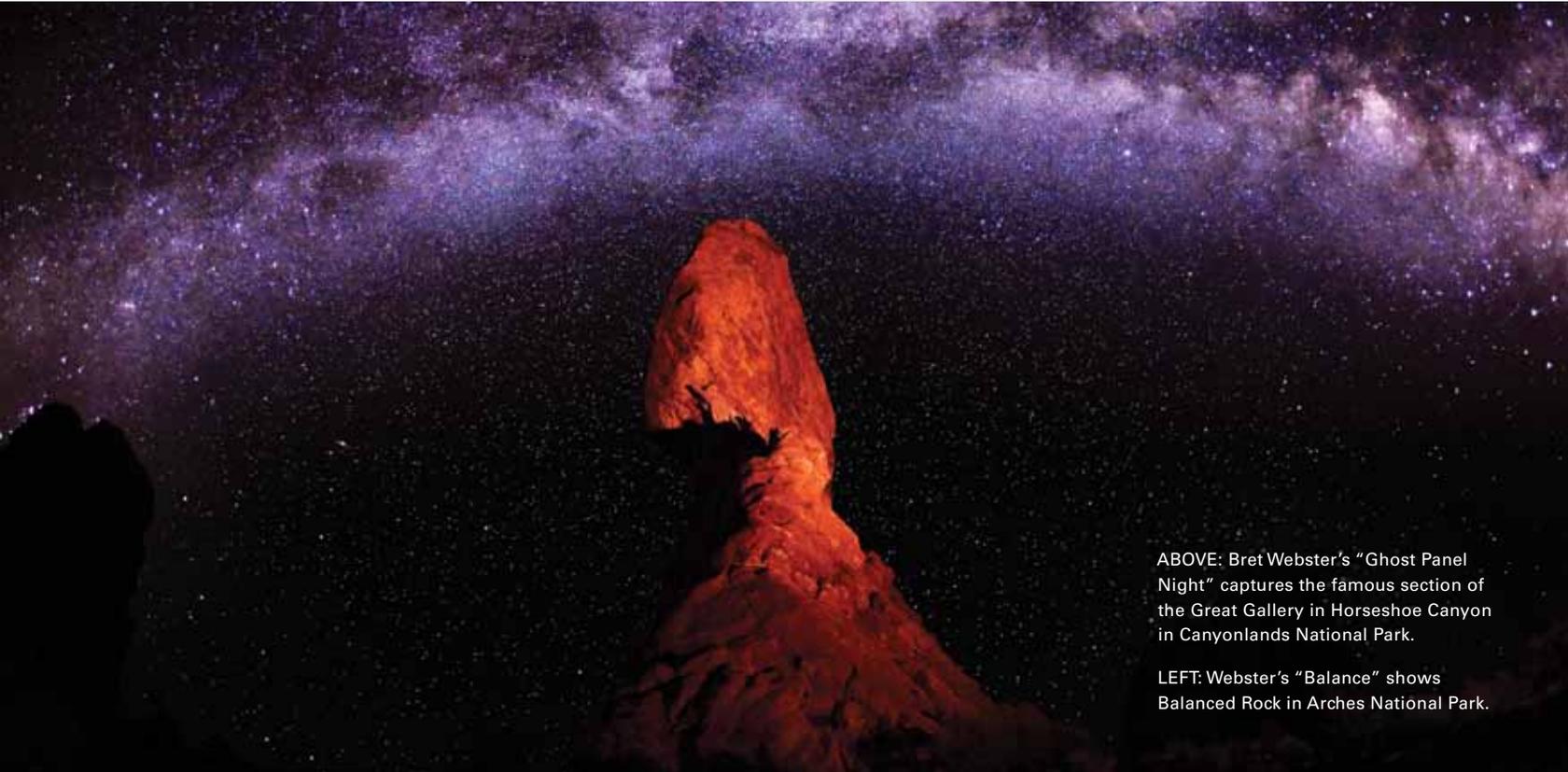
During the 2012 Utah State Legislative session, \$2.5 million was appropriated in new ongoing funds for the Engineering Initiative, which will help the University of Utah and other state-wide engineering programs recruit faculty and increase the number of engineering and computer science graduates. The Legislature also appropriated \$6 million in new funding for the USTAR initiative, including \$3 million in ongoing and \$3 million in one-time funds. Over the past six years, the USTAR initiative has attracted world-class researchers to the state and has brought in over \$175 million in direct and indirect research funds. USTAR is Utah's economic effort to facilitate research and technology commercialization in Utah.



NEW CHAIR OF MATERIALS SCIENCE AND ENGINEERING

Professor Feng Liu has been appointed chair of the Department of Materials Science and Engineering at the University of Utah. His research focuses on modeling and simulating properties of surfaces and interfaces, growth mechanisms of thin films, and self-assembly and self-organization of nano-structures. Liu was also recently elected an American Physical Society (APS) Fellow. He replaces former chair Anil Virkar, professor of materials science and engineering, who is director of the new Materials Research Science and Engineering Center at the U of U. The center will focus on developing next-generation materials for plasmonics and spintronics.

For the foreseeable future, Webster plans to continue both his photography and his work in the missile industry. “Actually I would say that photography affects my day job and vice-versa,” he says. “This creative side has improved my performance at work. Immersing myself in natural beauty seems to help my perspective. I feel balanced.”



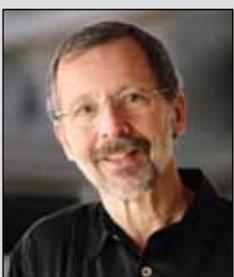
ABOVE: Bret Webster’s “Ghost Panel Night” captures the famous section of the Great Gallery in Horseshoe Canyon in Canyonlands National Park.

LEFT: Webster’s “Balance” shows Balanced Rock in Arches National Park.



REMEMBERING ADEL SAROFIM

We are deeply saddened to report the passing of Adel F. Sarofim, presidential professor of chemical engineering, on December 4, 2011. He was 77. With an academic career that spanned more than 50 years, Sarofim spent many years at MIT before coming to the University of Utah in 1996. Focusing on energy efficiency and pollution reduction, Sarofim worked on combustion science leading to advances in the reduction of pollutants released from fossil fuel combustion. His contributions to his field of study and to his former students and colleagues at the U of U will be greatly missed.



ED CATMULL TO BE COMMENCEMENT SPEAKER

Pixar president Edwin Catmull, a pioneer in the field of computer graphics, will deliver the University of Utah’s general commencement address on May 4. Catmull earned B.S. degrees in physics and computer science as well as a Ph.D. in computer science from the University of Utah. His 1972 “A Computer Animated Hand” film—made while he was a U of U student—was recently added to the National Film Registry. Catmull revolutionized the film industry with “Toy Story”—the first full-length feature film entirely generated by computer graphics. Catmull’s Pixar has since created dozens of animated films, such as “Finding Nemo,” sequels to “Toy Story,” and the popular “Cars” movies.

Deborah Coleman/Pixar



Students Learn the Art of Invention

University of Utah biomedical engineering sophomores Jessica Ashmead and Annicka Carter are getting a first-hand look at what it takes to invent and commercialize a medical device. They developed a surgical retractor with a battery-powered LED in a freshman bioengineering class at the University of Utah. They call it the OptiGuide. So far, they have received national recognition for their efforts and started the patent process with hopes of eventually selling their device to hospitals across the country.

surgeons to see what they are doing. We decided to design a tool that would get the light as close to the surgical cavity as possible.”

Their device only exists as a basic prototype today, but they have filed a provisional patent application with help from the U’s Technology Commercialization Office (TCO). The students also received \$5,000 and an honorable mention at the national Collegiate Inventors Competition last November in Washington, D.C.

“Next we are going to really research what the market wants and build an even better prototype so we can apply for a full patent,” Ashmead says. “This experience has motivated me to want to invent devices that really make a difference in the world. I want to do well in school, so I can get a job that allows me to do that all the time.”

Other similar medical retractors exist in the marketplace, so it is a hurdle for OptiGuide to secure a full patent and market their device while proving how their retractor is unique. The team is working with TCO to address this question, but they hope the OptiGuide’s battery power supply and the position of the lights is enough to make their device distinct.

Holly Holman, research scientist in bioengineering, taught the Invent class and mentored the young women, encouraging them to enter the Collegiate Inventors Competition after noticing their dedication and the potential for the OptiGuide. The competition is organized by Invent Now, a national nonprofit organization, and it is open to university students from across the country. Eighty graduate and undergraduate teams entered the competition this year, and 11 of them became finalists. The OptiGuide team was different for being one of the few finalists composed of freshmen. OptiGuide was also a finalist in the annual techTITANS business competition at the University of Utah.



Biomedical engineering sophomores **Annicka Carter** (left) and **Jessica Ashmead** (right).

The young women started the project in spring 2011 while in a class called “Invent.” Their assignment was to come up with a concept for a product, then spend the semester researching and developing their idea.

“After talking to local surgeons about the effectiveness of current lighting in an operating room, we discovered that there was room for improvement,” says Carter. “Although the light intensity in the operating room is great, shadows occupy the actual surgical cavity, making it more difficult than expected for