



Career Cornerstone News

Volume V, Issue XI

November, 2009



Career Cornerstone News is a Publication of the Sloan Career Cornerstone Center, the Premier Online Resource for Exploring Career Paths in Science, Technology, Engineering, Mathematics, Computing, and Healthcare.

Inside this issue:

<i>Does Energy Grow on Trees?</i>	1
<i>Universities Team Up on Futurity</i>	1
<i>NASA Design Contest in Exploration Systems</i>	2
<i>Degree Profile: Cardiovascular Technologist</i>	2
<i>Implanted Tooth Helps Restore Vision</i>	3
<i>Engineering and Computer Science Grads Earn Top Salary Offers in 2009</i>	4
<i>Engineers Design Self-Righting Buildings</i>	4

Does Energy Grow on Trees?

You've heard about flower power. What about tree power? It turns out that it's there, in small but measurable quantities. There's enough power in trees for University of Washington researchers to run an electronic circuit, according to results to be published in an upcoming issue of the Institute of Electrical and Electronics Engineers' Transactions on Nanotechnology. "As far as we know this is the first peer-reviewed paper of someone powering something entirely by sticking electrodes into a tree," said co-author Babak Parviz, a UW

associate professor of electrical engineering.

A study last year from the Massachusetts Institute of Technology found that plants generate a voltage of up to 200 millivolts when one electrode is placed in a plant and the other in the surrounding soil. The UW team sought to further academic research in the field of tree power by building circuits to run off that energy. They successfully ran a custom circuit solely off tree power.

Co-author Carlton Himes, a UW undergraduate student, spent last summer exploring likely



sites. Hooking nails to trees and connecting a voltmeter, he found that bigleaf maples, common on the UW campus, generate a steady voltage of up to a few hundred millivolts.

Find out about careers in science and engineering at www.careercornerstone.org.

Universities Team Up on Futurity

Futurity.org is a new website originally developed as a beta by Duke University, Stanford University, and the University of Rochester. Now it offers information on the latest discoveries in science, engineering, the environment, health, and more from dozens of North America's leading research universities.

Learning about the new ways science, math, and engineering are applied through research is a good way to find out

what it might be like to work in these fields. Many of the discoveries that impact our lives -- from the products we use, the food we eat, the medicine that helps up, the transportation we use, and even the way we communicate -- found their start in research labs at universities and companies across the country. Often students are involved in the research and gain first hand experience while at



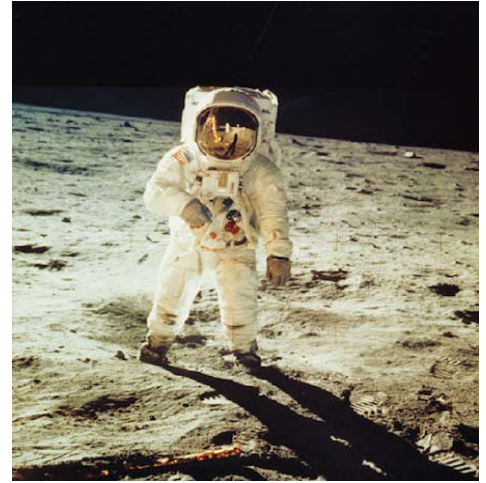
school. To explore degrees available at different universities and to explore what it might be like to work in the fields of science, technology, engineering, mathematics, and healthcare, visit www.careercornerstone.org.

NASA Design Contest in Exploration Systems

NASA is currently inviting college students to get involved with NASA's return to the moon by helping to design the tools and instruments needed for the next-generation manned moon rover. Student projects will tackle real problems to be solved for a successful manned lunar mission. Examples of problems include: navigation in the darkness around the moon's South Pole; sample retrieval and on-site analysis; radiation detection and avoidance; communication with lunar outpost, with orbiters and with Earth; video capture of sorties for transmission

back to Earth; astronaut rescue and recovery; and lunar regolith mitigation strategies for rover and space suits.

The contest is open to U.S. citizens enrolled full-time in an accredited post-secondary institution in the U.S., including universities, colleges, trade schools, community colleges and professional schools. Interdisciplinary teams are encouraged, across departments and institutions. An e-mail notice of intent is due by Dec. 15, 2009. Final entries are due on or before May 15, 2010.



For more information about the contest and to register online, visit <http://moontasks.larc.nasa.gov>.

Degree Profile: Cardiovascular Technologist

Cardiovascular technologists and technicians assist physicians in diagnosing and treating cardiac (heart) and peripheral vascular (blood vessel) ailments. They may specialize in any of three areas of practice: invasive cardiology, echocardiography, or vascular technology.

They schedule appointments, perform ultrasound or cardiovascular procedures, review doctors' interpretations and patient files, and monitor patients' heart rates. They also operate and care for testing equipment, explain test procedures, and compare findings to a standard to identify problems. Other day-to-day activities vary significantly between specialties.

The most common level of education completed by cardiovascular technologists and

technicians is an associate degree. The majority of technologists complete a 2-year junior or community college program, but 4-year programs are increasingly available. The first year is dedicated to core courses and is followed by a year of specialized instruction in either invasive, noninvasive cardiovascular, or noninvasive vascular technology.

In terms of salary, the median annual earnings of cardiovascular technologists and technicians is about \$42,300. Cardiovascular technologists and technicians hold about 45,000 jobs in the United States. About 3 out of 4 jobs are in hospitals (public and private),



primarily in cardiology departments.

Employment of cardiovascular technologists and technicians is expected to increase by 26 percent through the year 2016, much faster than the average for all occupations.

More information about a career as a cardiovascular technologist is at www.careercornerstone.org.

Implanted Tooth Helps Restore Vision

Blind for nine years, Sharron "Kay" Thornton has just regained her sight through a first-in-the-U.S. surgical procedure at Bascom Palmer Eye Institute at the University of Miami Miller School of Medicine. The procedure -- modified osteo-odonto-keratoprosthesis (MOOKP) -- implanted her eyetooth in her eye, as a base to hold a prosthetic lens. Thornton, 60, was blinded by Stevens-Johnson syndrome in 2000, a rare, serious skin condition destroys the cells on the surface of the eye causing severe scarring of the cornea.

On Labor Day weekend, after the last in a series of surgeries by corneal specialist Victor L. Perez, M.D., associate professor of ophthalmology at Bascom

Palmer Eye Institute, bandages were removed from Thornton's eyes and she was able to recognize faces only hours after her surgery. Two weeks following her surgery, she is already reading newsprint with a visual acuity of 20/70 and it is expected to improve further as her surgical scars heal.

Developed in Italy, MOOKP has proven effective as a solution to end-stage corneal disease where severe corneal scarring blocks



of the eye where a contact lens would sit, from chemical injuries, thermal burns, and inflammatory or autoimmune disorders, such as Stevens-Johnson syndrome.

Bascom Palmer Eye Institute is the largest ophthalmic care, research and educational facility in the southeastern United States. More than 250,000 patients are treated each year with nearly every ophthalmic condition and more than 18,000 surgeries are performed annually.

Find out more about a career as an ophthalmologist and explore dozens of other healthcare and science careers at www.careercornerstone.org.

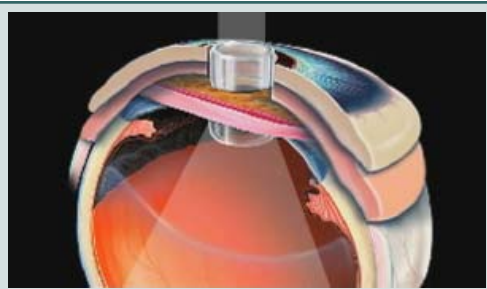


Image shows slice of tooth with lens inserted which allows light to enter the eye. An animation of the process is available at www.bpei.med.miami.edu/site/news/news_mookpVideo.asp

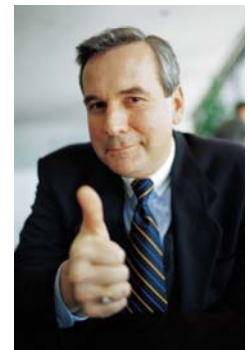
Image Source: Bascom Palmer Eye Institute
University of Miami Miller School of Medicine
Credit: Steven Gordon

vision and corneal transplants are no longer an option but the eye's internal structures and optic nerve remain healthy. Patients may have suffered trauma to their cornea, the outside surface

Sponsor the Sloan Career Cornerstone Center



The Sloan Career Cornerstone Center has a limited number of endowment and sponsorship opportunities for organizations, foundations, or corporations who wish to support those considering career paths in science, technology, engineering, mathematics, or healthcare.



More details on sponsorship: www.careercornerstone.org/sponsorship

Engineering and Computer Science Grads Earn Top Salary Offers in 2009

Which new college graduates are faring best when it comes to salary in the current economy? According to a new report from the National Association of Colleges and Employers (NACE), engineers are pulling down the highest starting salaries.

NACE's Summer 2009 Salary Survey report shows that four engineering disciplines and computer science account for the many of the disciplines getting the highest starting salary offers.



According to the survey, the average starting salaries were:

- Petroleum Engineering: \$83,121
- Chemical Engineering: \$64,902
- Mining Engineering: \$64,404
- Computer Engineering: \$61,738
- Nuclear Engineering: \$61,610
- Computer Science: \$61,407
- Electrical Engineering: \$60,125
- Mechanical Engineering: \$58,766
- Systems Engineering: \$57,438
- Industrial/Manufacturing Engineering: \$58,358
- Materials Engineering: \$57,349
- Engineering Technology: \$56,477
- Aerospace Engineering: \$56,311
- Agricultural Engineering: \$54,352
- Bioengineering: \$54,158
- Information Systems: \$52,089
- Civil Engineering: \$52,048



The Sloan Career Cornerstone Center offers complete profiles on each of these fields, including preparation, employment, responsibilities, an "average" day, and career path forecasts.

There are also podcasts about each field to listen to on the go, and a new twitter page at <http://twitter.com/CornerstoneNews> can help you keep track of career news too! Find out more at www.careercornerstone.org.

Engineers Design Self-Righting Buildings

A new earthquake-resistant structural system for buildings, just successfully tested in Japan, will not only help a multi-story building hold itself together during a violent earthquake, but also return it to standing up straight on its foundation afterward, true and plumb, with damage confined to a few easily replaceable parts. The team that designed the system was led by researchers at Stanford University and the University of Illinois. During testing on a massive shake table, the system survived simulated earthquakes in excess of magnitude 7. The system dissipates energy through the movement of steel frames that are situated around the building's core or along exterior walls. The frames can be part of a building's initial design or could be incorporated into an existing building undergoing seismic retrofitting. They are economically feasible to build, as all the materials employed are commonly used in construction today and all the parts can be made using existing fabrication methods. Explore career paths in engineering at www.careercornerstone.org.



After a shaking test, a (formerly flat) steel fuse shows the deformation caused by the energy it dissipated during shaking. The fuses are designed to absorb damage and are easily replaced after an earthquake.
Image Credit: Tsuyoshi Hikino, National Research Institute for Earth Science and Disaster Prevention, Japan