



Career Cornerstone News

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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 Medicine.

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Cornerstone Launches Career Podcasts

The Sloan Career Cornerstone Center has launched a weekly series of career Podcasts, each about 10-15 minutes in length.

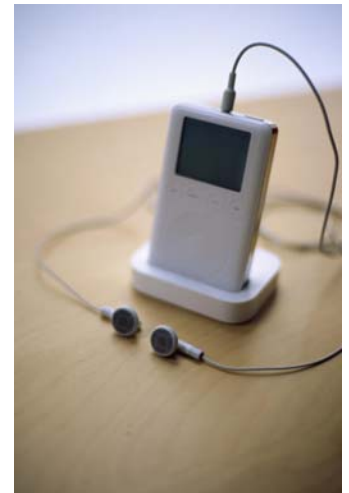
Each Podcast covers a different career path, such as dentistry, environmental engineering, or actuarial science, and also responds to questions posted by listeners.

Listeners have posted questions about a variety of topics including internships, summer programs, course selection, and salary expectations.

Listeners may download individual career path topics or may subscribe via iTunes.

The response has been extremely positive already, with subscribers such as Jim Fellows who is sharing the content weekly with his high school students in Michigan. "This speaks to students," he explains. "It's a quick peek, and then there's always more info on the internet."

Cornerstone Podcasts are in MP3 format, and while most listen to the free service on iPods or other MP3 players, they can



also be played on any computer, or shared with a group in a classroom, conference, or career center setting.

Listen to a Podcast, or subscribe at www.careercornerstone.org/podcast.htm.

Improving Emergency Care

Recognizing that access to emergency and trauma care system in this country is approaching a crisis point, the American Medical Association has issued recommendations to meet this problem head on. The ideas involve multiple strategies to advance emergency and trauma care and include advocating for the creation and funding of additional residency training positions in specialties that provide

emergency and trauma care to increase the physician workforce; working to ensure payment to physicians from insurers for providing emergency care; securing bonus payments for physicians providing emergency services in physician shortage areas, advocating for federal and state liability protection for emergency physicians; and improving the efficiency of emergency



care by identifying best practices for the staffing, delivery and financing of emergency services.

Find out more about many different career paths in the field of medicine at www.careercornerstone.org.

Math and Science Partnerships Boost Student Proficiencies

An analysis of 123 schools participating in the National Science Foundation (NSF) Math and Science Partnership (MSP) program shows improvements in student proficiency in mathematics and science at the elementary, middle- and high-school levels over a 3-year period.

The most recent data show continued increases since the MSP program was established in 2002. Students showed the most significant improvements in mathematics proficiency, with a 13.7% increase for elementary, 6.2% increase for middle-school,

and 17.1% increase for high-school students. Science proficiency at each level showed marked gains as well, with a 5.3% increase for elementary, 4.5% increase for middle-school, and 1.4% increase for high-school students.

NSF's MSP program supports partnerships among higher education, local K-12 school systems, and supporting stakeholders, such as businesses or informal science-education



The latest K-12 math and science data show steady increases in proficiency. Credit: Mark Whitmore

organizations. At a minimum, each partnership must contain one institution of higher education and one K-12 school system. Find out more at www.nsf.gov/ehr/MSP.

Degree Profile: Veterinary Science

Veterinarians play a major role in the healthcare of pets, livestock, and zoo, sporting, and laboratory animals. Some veterinarians use their skills to protect humans against diseases carried by animals and conduct clinical research on human and animal health problems. Others work in basic research, broadening the scope of fundamental theoretical knowledge, and in applied



research, developing new ways to use knowledge.

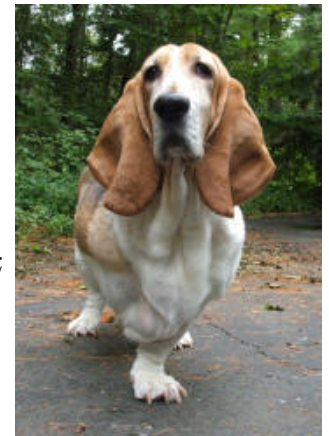
Most veterinarians perform clinical work in private practices. More than 50 percent of these veterinarians predominately or exclusively treat small animals. Small-animal practitioners usually care for companion animals, such as dogs and cats, but also treat birds, reptiles, rabbits, and other animals that can be kept as pets.

About one-fourth of all veterinarians work in mixed animal practices, where they see pigs, goats, sheep, and some nondomestic animals in addition to companion animals.

Veterinarians in clinical

practice diagnose animal health problems; vaccinate against diseases, such as distemper and rabies; medicate animals suffering from infections or illnesses; treat and dress wounds; set fractures; perform surgery; and advise owners about animal feeding, behavior, and breeding.

Find out more about careers in veterinary science and other fields of medicine online at www.careercornerstone.org/veterinarian/veterinarian.htm.



Give it a Little Hydrogen Gas!

When Princeton University engineers want to increase the power output of their new fuel cell, they just give it a little more gas -- hydrogen gas! Though the simple control mechanism was previously thought impossible, Jay Benziger, a professor of chemical engineering, and Claire Woo, who graduated in 2006, showed it can work.

Fuel cells, which use hydrogen to make electricity with only water and heat as byproducts, have attracted much attention as a clean alternative to fossil fuel-burning energy sources. Benziger and Woo's work is a potentially major development in fuel cell technology. The secret of their success is a system in which the fuel input itself changes the size of the reaction chamber, and therefore the amount of power produced. Previously, electrical resistors were used to dissipate excess power, sacrificing some of the fuel cell's efficiency. Benziger and Woo's breakthrough also adds to the understanding of water management in fuel cells -- one of

the major obstacles to large-scale deployment of the technology in automobiles.

The first applications of their design are likely to be in small machines such as lawn mowers, the researchers said. The machines would be easy to use, incorporating a design similar to the familiar acceleration systems of cars that use a pedal to increase the flow of fuel and the power output. The use of fuel cells in lawn care equipment would cut down on a major source of greenhouse gases, especially as emissions from these machines are largely unregulated.

The fact that Woo was able to contribute to such groundbreaking work while still an undergraduate is a testimony to her outstanding abilities and to the Princeton community and environment, Benziger said. For her part, Woo said the project confirmed her interest in going on to graduate school in chemical engineering. "It was a great experience," she said, praising Benziger's willingness to



Claire Woo helped discover an innovative control mechanism for fuel cells as an undergraduate in the lab of chemical engineer Jay Benziger. She graduated in June 2006 and is now pursuing a Ph.D. at the University of California, Berkeley.
Credit: Princeton University

help her with hardcore research or difficult questions about her future. "He was always willing to listen."

The work was supported by the National Science Foundation, including a Research Experiences for Undergraduates grant that supported Woo during her summer work. Find out more at <http://engineering.princeton.edu>.

Organizations Contributing Content to Career Cornerstone:

- American Chemical Society
- American Geological Institute
- American Institute of Chemical Engineers
- American Institute of Physics
- American Mathematical Society
- American Nuclear Society
- American Society of Civil Engineers
- American Statistical Association
- American Society of Mechanical Engineers
- Casualty Actuarial Society
- Institute of Electrical and Electronics Engineers
- JGPerpich, LLC
- Mathematical Association of America
- NASA
- Society for Industrial and Applied Mathematics
- Society of Actuaries
- The Minerals, Metals, and Materials Society
- US Department of Labor, Bureau of Labor Statistics
- Whitaker Foundation



Find out more at www.careercornerstone.org

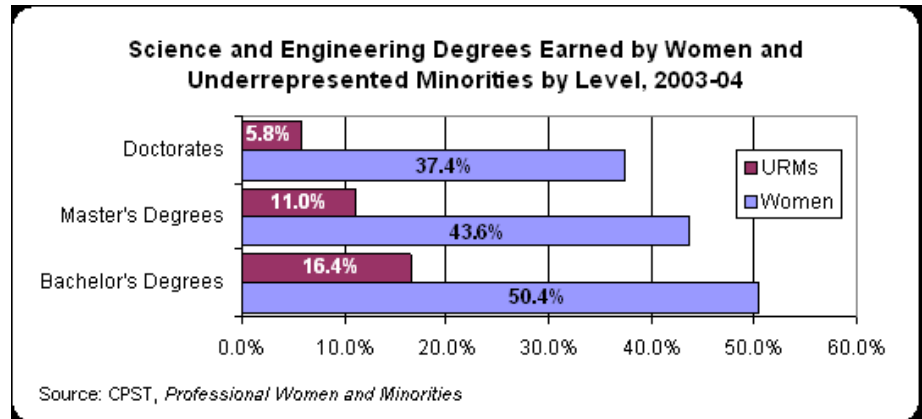
Professional Women and Minorities in STEM

Women have made substantial progress in preparing for careers in science and engineering (S&E), earning half (50%) of the bachelor's degrees, 44% of the master's and 37% of the doctorates awarded in S&E fields in 2003-04, according to the latest compendium of education, employment and demographic data, *Professional Women and Minorities*, published by the Commission on Professionals in Science and Technology (CPST).

The gains in science and engineering by underrepresented minorities (African Americans, Hispanics, and Native Americans) have been slower, but overall, progress is being made. Underrepresented minorities earned 16% of the bachelor's degrees, 11% of the master's, and nearly 6% of the doctorates awarded in S&E in 2003-04.

According to the CPST:

- Over the past forty years, women have more than doubled their share of the bachelor's degrees awarded



in science and engineering.

- In the last two decades, women are approaching parity in medicine, earning 46% of the degrees, and in law, earning 49%.
- Hispanics currently represent about 14% of the population. However, they earned only 7.3% of the bachelor's degrees, 4.3% of the master's degrees and 2.7% of the doctorates in S&E in 2003-04.
- African Americans, who represent about 13% of the U.S. population, earned 8.4% of the bachelor's, 6.3% of the master's and 2.8% of the doctorates in S&E.

- American Indians, who account for 1.0% of the U.S. population, earned less than 1% of degrees awarded in S&E regardless of level.

- Women have outnumbered men in higher education since 1979, and accounted for 57.2% of all college students enrolled in fall 2004.

Check out the special resources on the Sloan Career Cornerstone Center for women and underrepresented minorities at www.careercornerstone.org.

NASA Creates Microshutters

NASA engineers and scientists building the James Webb Space Telescope have created a new telescope technology called "microshutters." "Microshutters" are tiny doorways that bring stars and galaxies very far away into better focus. This new technology will go aboard the James Webb Space Telescope, to be launched into space in a decade. The microshutters will enable scientists to block unwanted light from objects closer to the camera in space, letting the light from faraway objects shine through. To get an idea of how these tiny little "hairlike" shutters work, think about how you try to make something look clearer – you squint. By squinting, your eyelashes block out light closer to you. That's similar to how the microshutters work. These microshutters will allow the telescope to focus on the faint light of stars and galaxies so far away, they formed early in the history of the universe. That's because light travels at 186,000 miles per second, and light is still traveling through space from the time the universe started. No other telescope has this microshutter technology. The Webb Telescope will take over for the Hubble Space Telescope. It is planned for launch in the next decade. More details are at <http://jwst.gsfc.nasa.gov>.

