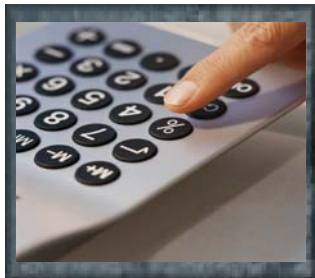




# Career Cornerstone News

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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 Healthcare.**

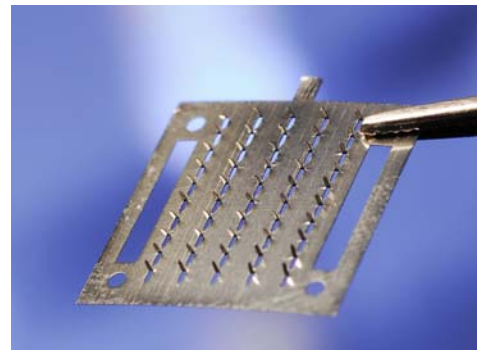
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## Flu Vaccine Via Microneedle Patch

Flu vaccine delivered through skin patches containing microneedles has proven just as effective at preventing influenza in mice as intramuscular, hypodermic flu immunization. A team of researchers at Emory University and the Georgia Institute of Technology believes the new microneedle skin patch method of delivering flu vaccine could improve overall seasonal vaccination coverage in people because of decreased pain, increased convenience, lower cost, simpler logistics over conventional hypodermic immunization.

The patches used in the experiments contained an array of stainless steel microneedles coated with inactivated influenza virus. The patches were pressed manually into the skin and after a few minutes, the vaccine coating dissolved off within the skin. The researchers found that the microneedle vaccinations induced strong immune responses against influenza virus that were comparable to immune responses induced by the intramuscular, hypodermic



immunizations. Other advantages of the microneedle patches could include more convenient storage, easier transportation and lower dosage requirements.

Find out more at <http://whsc.emory.edu>; explore careers in medicine and engineering at [www.careercornerstone.org](http://www.careercornerstone.org).

## NOAA Sends Teachers to Sea

The National Oceanic and Atmospheric Administration's (NOAA) Teacher at Sea program provides a unique environment for learning and teaching by sending kindergarten through college-level teachers to sea aboard NOAA research and survey ships to work with both scientists and crew. Then, armed with new understanding and experience, teachers bring this knowledge back to their classrooms. Perhaps the greatest payoff of NOAA's Teacher

at Sea program is the enthusiasm for learning more about our ocean planet generated between teachers and students. Since its inception in 1990, the program has enabled more than 500 teachers to gain first-hand experience of science and life at sea. The teachers enrich their classroom curricula with a depth of understanding made possible by living and working side-by-side, day and night with those who contribute to the world's body of oceanic and atmospheric scientific knowledge.



**NOAA Teacher at Sea, Chris Monsour, assists in tagging a shark aboard NOAA Ship OSCAR ELTON SETTE Credit: NOAA**

Find out more at <http://teacheratsea.noaa.gov>.

## High School Diploma No Longer Enough

According to recent data from the Bill and Melinda Gates Foundation, today only 71% of students earn a high school diploma, fewer than six in 10 minority students graduate with their peers, and many graduates are unprepared for college. The Foundation says that "Success in the 21st century demands skills, attitudes, and abilities that require more than a high school diploma. Yet today only about half of all Americans have a college degree or certificate,



a number that drops to about 20% for Hispanics and African Americans. It is no longer enough to say more young people are accessing college. For the sake of their future and our country's future, we have to make sure more young people go on to complete college. We have set an ambitious goal for ourselves and the nation: double the number of young people who earn a postsecondary degree or certificate by the time they reach age 26. The "Postsecondary Success" plan points out that while our rate of high school graduates going to college continues to rank

among the highest in the world, most students will never complete college. Only about half of U.S. college students graduate within six years. The rate for low-income students is closer to 25%, and only about 20% of African-American and Hispanics aged 25-34 have earned some kind of postsecondary degree. And among community college students, the graduation rate is estimated to be 38%. Find out more at [www.gatesfoundation.org](http://www.gatesfoundation.org). Find out about 170+ careers in science, engineering, math, and healthcare at [www.careercornerstone.org](http://www.careercornerstone.org). Many of the profiled fields require a two year associate degree for preparation.

## Degree Profile: Medical Records Technician

Every time a patient receives health care, a record is maintained of the observations, medical or surgical interventions, and treatment outcomes. This record includes information that the patient provides concerning his or her symptoms and medical history, the results of examinations, reports of x-rays and laboratory tests, diagnoses, and treatment plans. Medical records and health information technicians organize and evaluate these records for completeness and accuracy. Technicians assemble



patients' health information, making sure that patients' initial medical charts are complete, that all forms are completed and properly identified and authenticated, and that all necessary information is in the computer. They regularly communicate with physicians and other health care professionals to clarify diagnoses or to obtain additional information. Technicians regularly use computer programs to tabulate and analyze data to improve patient care, better control cost, provide documentation for use in legal actions, or use in research studies. Some medical records and health information technicians specialize in coding patients' medical information for



insurance purposes. Medical records and health information technicians also may specialize in cancer registry.

Medical records and health information technicians generally obtain an associate degree to be prepared for this field, which currently offers a median income of about \$29,290 a year.

More information about a career as a medical records and health information technician is at [www.careercornerstone.org](http://www.careercornerstone.org).

## Google Earth Aids in Fossil Discovery

A limestone countertop, a practiced eye and Google Earth all played roles in the discovery of a trove of fossils that may shed light on the origins of African wildlife. The saga began when University of Michigan paleontologist Philip Gingerich, an authority on ancient whales, learned of a whale fossil from Egypt that had been discovered in a most unconventional way. At a stonecutting yard in Italy where blocks of stone from around the world are sliced up for countertops, masons had noticed what looked like cross-sections of a skeleton in slabs cut from a huge hunk of limestone imported from Egypt. These turned out to be fossilized remains of a whale that lived in Egypt 40 million years ago, when the region was covered by ocean.

Gingerich wanted to visit the site where the limestone was quarried, but the exact location was something of a mystery. Instead of setting out blindly across the desert, Gingerich sat down at his computer and clicked on Google Earth. On his virtual expedition,

Gingerich followed bluffs, and looked for roads in the area that might lead to quarries. Finally, about 75 miles east of Sheikh Fadl, he came across a road that traveled north to a deeply pocked area that just had to be a cluster of quarries. Then, he traveled to the location and found his google search was on target — he found a large quarry operation blasting out blocks of limestone.

While scanning the scene, something caught his eye: bands of red in the white limestone walls of the quarry. He quickly realized the red bands represented layers of loose soil that were blown into ancient caves. "Suddenly it dawned on me: There should be animals preserved in that sediment, too, because caves often act as traps," Gingerich said. When he searched at the base of one rock outcrop, there were tiny bones everywhere. The bones and teeth---remains of

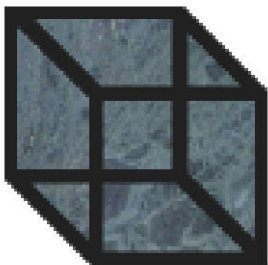


small mammals that lived in the early Miocene Epoch, some 18 to 20 million years ago---are the first small mammal fossils of that age to be found in Egypt.

They may even represent some of the first mammals to migrate from Asia to Africa when the land bridge between the two continents first formed.

Google Earth software is available at <http://earth.google.com> for free. Find out more about careers in science at [www.careercornerstone.org](http://www.careercornerstone.org).

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Or, just click on this box on the left site of any page.

Find out more at [www.careercornerstone.org/addalink.htm](http://www.careercornerstone.org/addalink.htm)

## President Inspires Next Generation of Scientists & Engineers

During a speech this spring at the National Academy of Sciences, President Obama announced a National Science Foundation / Department of Energy collaboration that addresses the need to "spark a sense of wonder and excitement" in the nation's young people to pursue careers in science and engineering. As part of President Obama's "New Energy for America" plan, the Administration will provide the opportunity for thousands of American students to pursue careers in science, engineering, and entrepreneurship related to clean energy. These young men and women will invent and help commercialize advanced energy



technologies such as efficient and cost effective methods for converting sunlight to electricity and fuel, carbon capture and sequestration, stationary and portable advanced batteries for plug-in electric cars, advanced energy storage concepts that will enable sustained energy supply from solar, wind, and other renewable energy sources, high-efficiency deployment of power across the so-called "smart grid" and carbon neutral commercial and residential buildings.

Among the efforts recommended include individual fellowships to graduate students involved in clean energy research, integrative graduate training programs involving clean energy, research experiences for undergrads in energy, and technician education to

improve education for young Americans who will become technicians in clean energy fields, focusing on two- and four-year college programs. In addition, focused Research in K-12 Science Education Strategies and Innovative Technology Experiences for Students and Teachers will address how students learn about science and technology, evaluating immediate challenges in primary and secondary schools and envisioning science education as it could be in future decades. Find out more about careers in science and engineering at [www.careercornerstone.org](http://www.careercornerstone.org).



## The Cosmos in a Coffee Cup

A Duke University professor and his graduate student have discovered a universal principle that unites the curious interplay of light and shadow on the surface of your morning coffee with the way gravity magnifies and distorts light from distant galaxies. They think scientists will be able to use violations of this principle to map unseen clumps of dark matter in the universe. Light rays naturally reflect off a curve like the inside surface of a coffee cup in a curving, ivy leaf pattern that comes to a point in the center and is brightest along its edge. Mathematicians and physicists call that shape a "cusp curve," and they call the bright edge a "caustic," based on an alternative dictionary definition meaning "burning bright," explains Arlie Petters, a Duke professor of mathematics, physics and business administration. "It happens because a lot of light rays can pile up along curves." Drawn by the mathematically-inclined artist Leonardo da Vinci in the early 16th century, caustics can be seen elsewhere in everyday life, including sunlight reflecting across a swimming pool's surface and choppy wave-light patterns reflecting off a boat hull. "Mother Nature has to be creating these things," Petters said. "It's amazing how what we can see in a coffee cup extends into a mathematical theorem with effects in the cosmos." Find out more about careers in physics and mathematics at [www.careercornerstone.org](http://www.careercornerstone.org).



Light reflected from metal ring's sides produces coffee cup 'cusp curve' effect.  
Image Credit: Henrik Wann Jensen, University of California, San Diego