



# 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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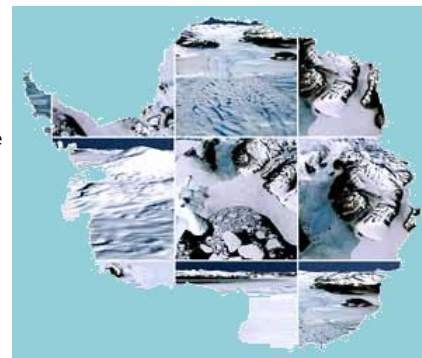
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## 2008 NASA Antarctica Quest Challenge

The Landsat Image Mosaic of Antarctica (LIMA) is the first-ever true-color high-resolution satellite view of the Antarctic continent enabling everyone to see Antarctica as it appears in real life. This new view of Antarctica will revolutionize Antarctica research. A website (<http://lima.nasa.gov>) has also been developed to celebrate the International Polar Year ([www.us-ipy.gov](http://www.us-ipy.gov)), and to familiarize people with Antarctica. The site explores the richness of its features and demonstrates how scientists use satellite imagery to study the continent. A new NASA Quest program begins this month that challenges precollege students to

study the features of Antarctica. Participating students will develop a research question and argue the value of studying a specific feature based on the new views of Antarctica that are available. NASA Quest Challenges are free, web-based, and interactive explorations designed to engage students in authentic scientific and engineering processes. The solutions relate to issues encountered daily by NASA personnel.

National programs and projects such as NASA Quest are great opportunities for precollege students to network with other students, meet



professionals in the field, and gain hands-on experience solving real science and engineering challenges. There are dozens of mathematics, science, and engineering competitions to choose from. An extensive list of programs and projects is available online at [www.careercornerstone.org/precolprep.htm](http://www.careercornerstone.org/precolprep.htm).

## First Synthetic Bacterial Genome

A team of 17 researchers at the J. Craig Venter Institute (JCVI) has created the largest man-made DNA structure by synthesizing and assembling the 582,970 base pair genome of a bacterium, *Mycoplasma genitalium* JCVI-1.0. This work is the second of three key steps toward the team's goal of creating a fully synthetic organism. In the next step, which is ongoing at the JCVI, the team will attempt to create a living bacterial cell based entirely on the

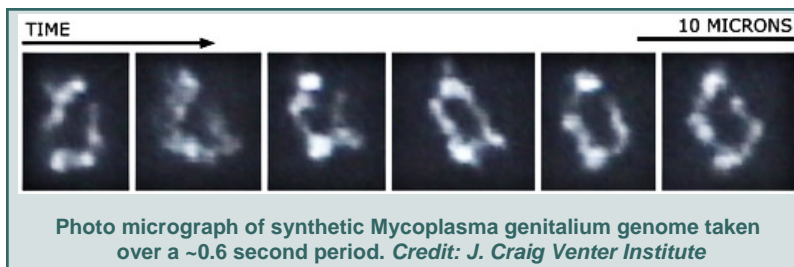


Photo micrograph of synthetic *Mycoplasma genitalium* genome taken over a ~0.6 second period. Credit: J. Craig Venter Institute

synthetically made genome. The team achieved this technical feat by chemically making DNA fragments in the lab and developing new methods for the assembly and reproduction of the DNA segments.

After several years of work perfecting chemical

assembly, the team found they could use homologous recombination (a process that cells use to repair damage to their chromosomes) in the yeast *Saccharomyces cerevisiae* to rapidly build the entire bacterial chromosome from large subassemblies. More details are at [www.jcvi.org](http://www.jcvi.org).

## 1/3 of Young Women Have Bachelor's Degrees

About 33 percent of young women 25 to 29 had a bachelor's degree or more education in 2007, compared with 26 percent of their male counterparts, according to tabulations recently released by the U.S. Census Bureau. The report showed that among adults 25 and older, men remain slightly more likely than women to hold at least a bachelor's degree (30 percent compared with 28 percent). However, as the percentage for women rose between 2006 and 2007 (from 27 percent), it remained statistically unchanged for men.

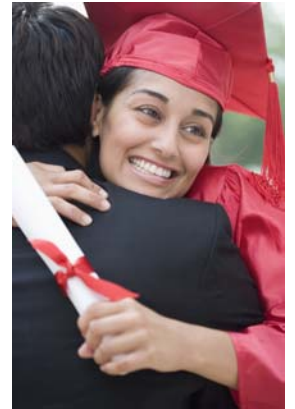
The tables also showed that more education continues to pay off in a big way: Adults with advanced degrees earn four times more than those with less than a high school diploma. Workers 18 and older with a master's, professional or doctoral degree earned an average of \$82,320 in 2006, while those with less than a high school diploma earned \$20,873.

Workers 18 and older with a bachelor's degree earned an average of \$56,788 in 2006, while those with a high school diploma earned \$31,071.

In addition, the report showed

that more than half of Asians 25 and older had a bachelor's degree or more (52 percent), compared with 32 percent of non-Hispanic whites, 19 percent of blacks and 13 percent of Hispanics.

Find out more about different types of academic degrees at [www.careercornerstone.org](http://www.careercornerstone.org).



## Degree Profile: Pharmacist

Pharmacists distribute drugs prescribed by physicians and other health practitioners and provide information to patients about medications and their use. They advise physicians and other health practitioners on the selection, dosages, interactions, and side effects of medications. Pharmacists also monitor the health and progress of patients in response to drug therapy to ensure the safe and effective use of medication.

Pharmacists must understand the use, clinical effects, and composition of drugs, including their chemical, biological, and physical



properties. Compounding -- the actual mixing of ingredients to form powders, tablets, capsules, ointments, and solutions -- is a small part of a pharmacist's practice, because most medicines are produced by pharmaceutical companies in a standard dosage and drug delivery form. Some pharmacists specialize in specific drug therapy areas, such as intravenous nutrition support, oncology (cancer), nuclear pharmacy (used for chemotherapy), geriatric pharmacy, and psychopharmacotherapy (the treatment of mental disorders by means of drugs).

Courses offered at colleges of pharmacy are

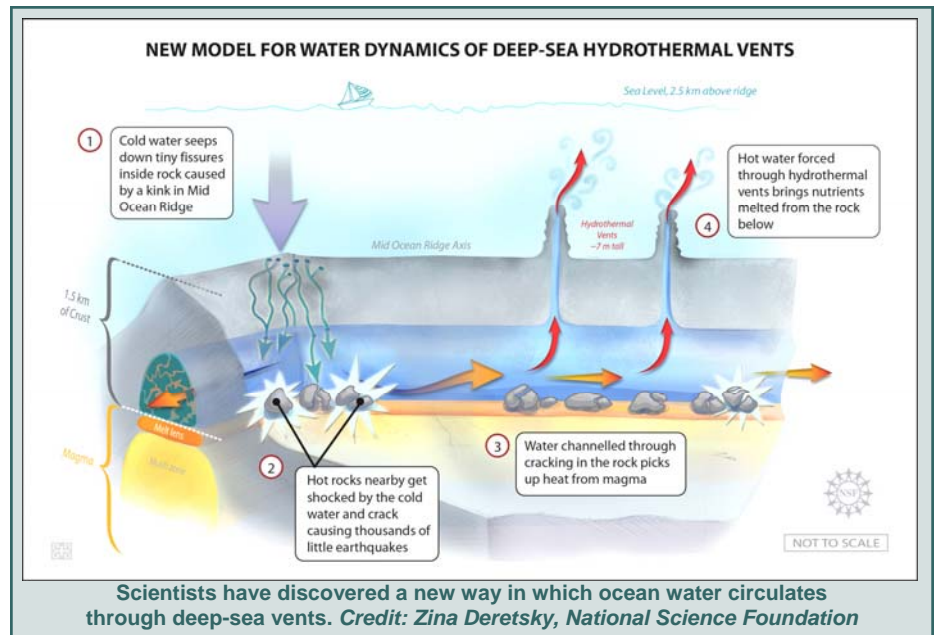


designed to teach students about all aspects of drug therapy. The Pharm.D. is a 4-year program that requires at least 2 years of college study prior to admittance, although most applicants have completed 3 years. Prospective pharmacists should have scientific aptitude, good communication skills, and a desire to help others. They also must be conscientious and pay close attention to detail, because the decisions they make affect human lives. Find out more about careers in pharmacy at [www.careercornerstone.org](http://www.careercornerstone.org).

# Ocean Quakes Reveal Circulation System

Zigzagging some 60,000 kilometers across the ocean floor, Earth's system of mid-ocean ridges plays a pivotal role in many workings of the planet: in plate-tectonic movements, heat flow from the interior, and the chemistry of rock, water and air. Now, a team of seismologists working in 2,500 meters of water on the East Pacific Rise, some 565 miles southwest of Acapulco, Mexico, has made the first images of one of these systems--and it doesn't look the way most scientists had assumed.

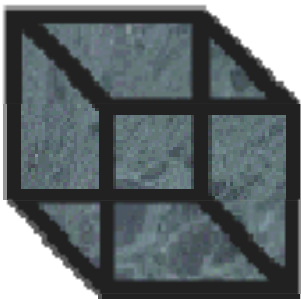
It was not until the late 1970s that scientists discovered the existence of vast plumbing systems under the oceans called hydrothermal vents. The systems pull in cold water, superheat it, then spit it back out from seafloor vents--a process that brings up not only hot water, but dissolved substances from rocks below. Unique life forms feed off the vents' stew, and valuable minerals including gold may pile up. The hypothetical image of a hydrothermal-vent system shows water forced down by overlying pressure through large faults along



ridge flanks. The water is heated by shallow volcanism, then rises toward the ridges' middles, where vents tend to cluster. The research team's calculations suggest that water moves a lot faster than previously thought--perhaps a billion gallons per year--through these systems. The water appears to descend instead through a buried 200-meter-wide chimney atop the ridge studied on the East Pacific Rise, run below the ridge along its axis through a tunnel just

above a magma chamber, then bubble back up through a series of vents further along the ridge. The images were created using seismometers planted around the ridge to record tiny, shallow earthquakes--in this study, 7,000 of them over seven months in 2003 and 2004. Find out more at <http://nsf.gov/geo/oce>. Career information in science and oceanography are available at [www.careercornerstone.org](http://www.careercornerstone.org).

## Link to the Sloan Career Cornerstone Center



Why not link to the Sloan Career Cornerstone Center from your website? Link to individual pages such as precollege resources, to degree profiles, or to our podcasts or newsletter. We're happy to provide you with a custom graphic or any materials you need!

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

## Teens Confident in Their Inventiveness

American teens are confident they can invent solutions to some of the world's pressing challenges, such as protecting and restoring the natural environment, but more than half feel unprepared for careers in technology and engineering, the Lemelson-MIT Invention Index has found this year. The Lemelson-MIT Invention Index, which gauges Americans' attitudes toward invention and innovation, also found there is an important need for more project-based learning in high schools.

Nearly three out of four American teens (72 percent) believe technological inventions or innovations can solve some of our pressing environmental issues within the next decade, including global warming, water pollution and fossil fuel depletion. Nearly two-thirds of teens (64 percent) are confident they could invent some of these solutions. This

contrasts with only 38 percent of adults who believe they could invent something to help protect and restore the natural environment. Of those adults, more than half are 18-24 years old.

The Lemelson-MIT Invention Index found that more than half of American teens (59 percent) do not believe their high school is preparing them adequately for a career in technology and engineering. The disparity is more pronounced among some groups historically under-represented in these fields. Nearly two-thirds of African-American teens (64 percent) and teen girls (67 percent) believe they are not prepared in school for these careers.

A vast majority of teens (79 percent) believe there is value in hands-on, project-based science,



technology, engineering and math (STEM) education and learning in high school. The same percentage of teens also believes more funding is needed for these types of programs.

Visit [www.careercornerstone.org](http://www.careercornerstone.org) and click on precollege ideas to find out about national and regional programs and projects that allow pre-university students to explore math, science, engineering, and technology.

## Signing Bonuses For College Grads?

Competition for new college graduate hires remains robust, and many employers expect to offer signing bonuses to clinch the deal in 2008, according to the National Association of Colleges and Employers (NACE).

Nearly 54 percent of the employers responding to a recent survey said they will use signing bonuses to sweeten the deal for potential hires. That's a sizable increase over the 47 percent of respondents who reported that they expected to offer bonuses in 2007.

Also underscoring the level of competition employers face: The size of the average bonus has increased. Among respondents who plan to offer a bonus to all entry-level college hires, the average signing bonus is \$4,450 - up 25 percent from last year's average of \$3,568. However, two-thirds of those using bonuses expect to offer them to just selected candidates, and average bonus offers vary according to a number of factors, including the candidate's degree and degree level.

