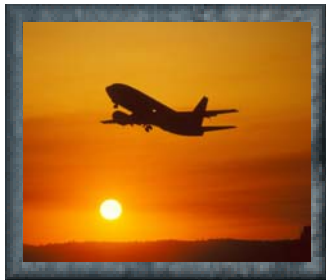




Career Cornerstone News

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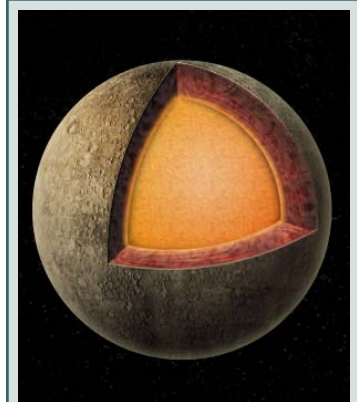
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Mercury's Soft Center

By tracking a subtle wobbling of the planet Mercury as it spins about its axis, researchers using a trio of ground-based telescopes have found strong evidence that the planet has a molten core. The researchers showed that careful measurements of Mercury's spin -- to an accuracy of one in 100,000 -- reveal that the planet's interior is decoupled from its exterior, providing strong evidence of a molten core. The researchers included astronomer Jean-Luc Margot of Cornell University, Stan Peale of the University of

California, Santa Barbara, Ray Jurgens and Martin Slade of the Jet Propulsion Laboratory in Pasadena, CA, and Igor Holin of the Space Research Institute in Russia. While most models for the formation of Mercury suggest the planet has an iron-rich core, many predict that the core is solid after billions of years of cooling.

To obtain their measurements, the astronomers compared the properties of the return signal as it struck the distributed telescope locations on Earth's surface. The amplitude of the wobbling was twice what the researchers



An artist's rendition of the interior structure of Mercury suggests that the metallic core extends from the center through a large fraction of the planet. Ground-based telescope observations suggest that the outer core is molten.
 Credit: Nicolle Rager Fuller, National Science Foundation

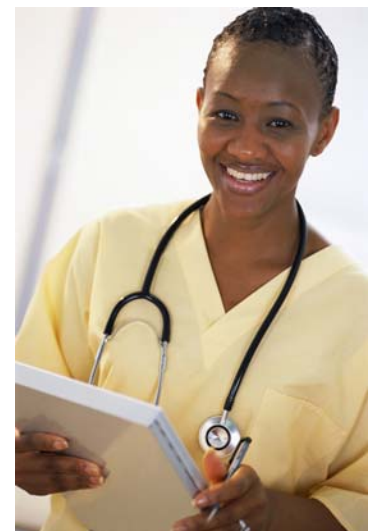
expected for a solid planet, but on par with an object that has a solid exterior and liquid core.

Physician Quality Measures

Several new quality measures to help physicians provide high quality care to patients were approved recently by the American Medical Association (AMA)-convened Physician Consortium for Performance Improvement (Consortium). The measures bring the total number of Consortium physician quality measures to just under 200.

All Consortium measures are available on the AMA Web site for physicians to easily access at www.physicianconsortium.org.

The Consortium was founded in the year 2000 to bring physicians together to create measures to implement best care practices, and with more than 100 national medical specialty and state medical societies, government and medical board members, the Consortium has already developed quality measures for conditions like hypertension, asthma and heart failure. The Consortium has developed performance measures that cover conditions that represent 80 percent of Medicare spending.



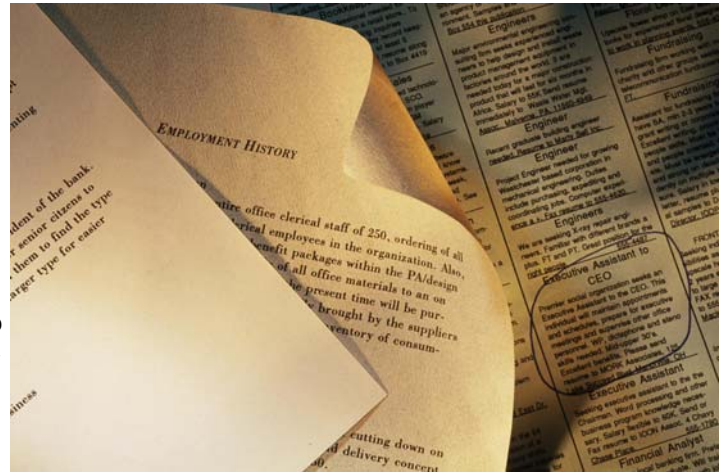
Job Hunting? Visit College Career Centers

The secret to job-search success for new college graduates may be using their campus career center, according to a new study conducted by the National Association of Colleges and Employers.

NACE's 2007 Graduating Student Survey found that 52 percent of students who reported securing full-time jobs had applied for a job through a campus career center-sponsored career fair, and 41 percent had posted their resumes through their campus career center's web site. Interestingly, however, the study found that the most effective methods weren't the most popular among students.

Nearly 71 percent of the 12,000+ students responding to the survey indicated that they had applied for a job by sending their resumes directly to an employer's web site.

The next most popular method, reported by 47 percent of students, was to mail a resume directly to the employer. Applying at a career center-sponsored job



fair (44 percent) and posting a resume through the career center web site (34 percent) trailed in popularity.

Explore other job hunting resources at www.careercornerstone.org.

Degree Profile: Veterinary Technology

Owners of pets and other animals today expect state-of-the-art veterinary care. To provide this service, veterinarians use the skills of veterinary technologists and technicians, who perform many of the same duties for a veterinarian that a nurse would for a physician, including routine laboratory and clinical procedures.

Veterinary technologists and technicians typically conduct clinical work in a private practice under the supervision of a veterinarian -- often performing various medical tests along



with treating and diagnosing medical conditions and diseases in animals. For example, they may perform laboratory tests such as urinalysis and blood counts, assist with dental prophylaxis, prepare tissue samples, take blood samples, or assist veterinarians in a variety of tests and analyses in which they often utilize various items of medical equipment, such as test tubes and diagnostic equipment.

Besides working in private clinics and animal hospitals, veterinary technologists and technicians may work in research facilities, where they may administer medications orally or topically, prepare samples



for laboratory examinations, and record information on an animal's genealogy, diet, weight, medications, food intake, and clinical signs of pain and distress.

Find out more about careers in veterinary technology at www.careercornerstone.org.

Several Diseases Similar at Molecular Level

Alzheimer's disease, Parkinson's disease, type 2 diabetes, the human version of mad cow disease, and other degenerative diseases are more closely related at the molecular level than scientists realized.

While still preliminary, the research, could help scientists develop tools for diagnosing such diseases, and potentially for treating them through "structure-based drug design," said David Eisenberg, a UCLA chemist and molecular biologist who is part of the research team.

The researchers studied the harmful rope-like structures known as amyloid fibrils -- linked protein molecules that form in the brain.

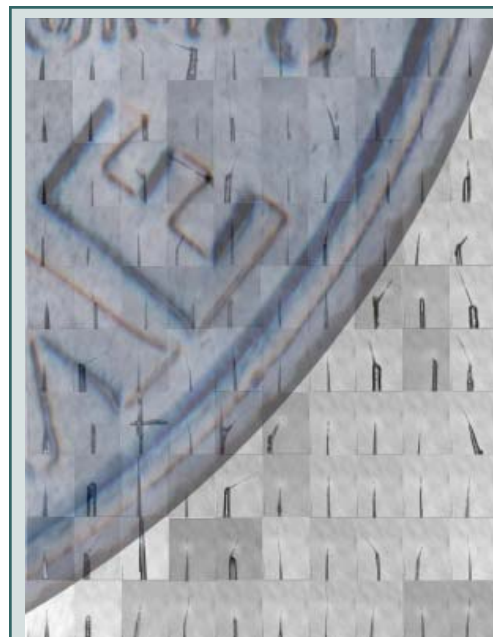
The fibrils contain a stack of water-tight "molecular zippers."

"With each disease, a different protein transforms into amyloid fibrils, but all of these diseases are similar at the molecular level," Eisenberg said.

If the molecular zipper is universal in amyloid fibrils, as Eisenberg believes, is it possible to pry open the zipper or prevent its formation?

Eisenberg's research team used X-ray analysis and a sophisticated computer algorithm to study proteins known to be associated with human diseases. When the computer said a protein will form an amyloid fibril, it almost always did. And one team member is experimenting with various compounds to break up the fibrils.

"Structural analysis of micro-crystals of proteins is an example of how basic research can have a profound impact on our understanding of health, biotechnology and other practical issues," said Parag Chitnis, program director in National Science Foundation's (NSF) Division of Molecular and Cellular Biosciences.



A montage of micro-crystals is used to determine the microscopic structures of Alzheimer's, other diseases, with the image of a U.S. dime superimposed.
Credit: UCLA

NSF, the Howard Hughes Medical Institute and the National Institutes of Health supported the research.

Find out more at www.ucla.edu.

Organizations Contributing Content to Career Cornerstone:

- American Chemical Society
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- American Institute of Chemical Engineers
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- American Mathematical Society
- American Nuclear Society
- American Society of Civil Engineers
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- NASA
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- Society of Actuaries
- The Minerals, Metals, and Materials Society
- US Department of Labor
- Whitaker Foundation



Find out more at www.careercornerstone.org

GENI Project Helps Plan Future Internet

If the proverbial genie gave Internet users three wishes for an improved network what would they ask for? Peace of mind about secure financial transactions? Protection from hackers? Inventive new applications that improve the quality of life?

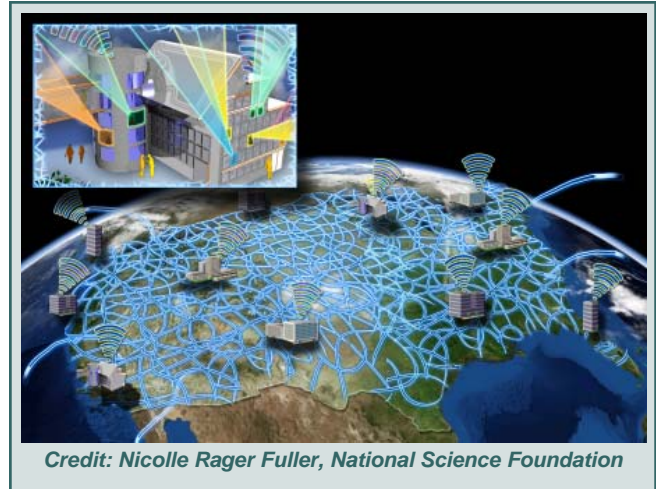
With support from the National Science Foundation, researchers are working together to design a bold new research platform called GENI, the Global Environment for Network Innovations.

As envisioned, GENI will allow researchers throughout the country to build and experiment with completely new and different designs and capabilities that will inform the creation of a 21st Century Internet.

GENI is envisioned as a set of components including optical

substrates, forwarders, storage, process clusters, sensor fields, and wireless regions combined with a software management framework. That configuration will allow researchers to run thousands of experiments simultaneously.

"GENI will give scientists a clean slate on which to imagine a completely new Internet that will likely be materially different from that of today. We want to ensure that this next stage of transformation will be guided by the best possible network science, design, experimentation, and engineering," said principal



Credit: Nicolle Rager Fuller, National Science Foundation

investigator and project director Chip Elliott of BBN Technologies, the company that has been selected to serve as the GENI Project Office.

The office will work closely with the computing research community to create and develop the GENI design. Find out more at <http://gpogeni.net>.

Wind Machine Simulates Cat 3 Hurricanes

It will huff, and puff, and blow the house in -- but only for research purposes. University of Florida engineers have unveiled the world's largest portable hurricane wind and rain simulator. Mounted on a trailer, the industrial-sized behemoth is composed of eight 5-foot-tall industrial fans powered by four marine diesel engines that together produce 2,800 horsepower. To cool the engines, the system taps water from a 5,000-gallon tank aboard a truck that doubles as the simulator's tow vehicle. Engineers plan to use the simulator to blast vacant homes with winds of up to 130 mph (Category 3 on the Saffir-Simpson Hurricane Scale) and high-pressure water jets that mimic wind-driven torrential rain. The goal? To learn more about exactly how hurricanes damage homes, and how to modify them to best prevent that damage. The simulator, which cost about \$500,000 in parts and labor, was designed and constructed entirely by Forrest Masters, an assistant professor of civil and coastal engineering, lab manager Jimmy Jesteadt, and a team of undergraduate students. More details are at www.ce.ufl.edu.



University of Florida wind engineering researcher Forrest Masters stands on a newly completed, fully portable hurricane wind simulator.

Photo credit: Kristen Bartlett Grace/University of Florida