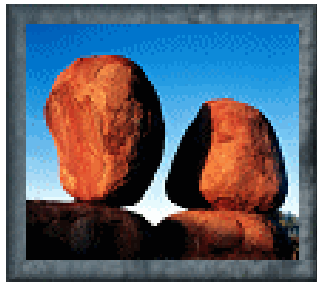




Career Cornerstone News

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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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Funding Education Beyond High School

The U.S. Department of Education recently released a comprehensive guide to federal student aid for students and their families looking to fund a college education. Published by the Department's Office of Federal Student Aid, "Funding Education Beyond High School" provides an overview of the process for applying for federal student aid as well as detailed steps for taking action during each phase. The guide addresses such topics as basic eligibility requirements, the types

of federal student aid (grants, work-study and loans), completing the Free Application for Federal Student Aid (FAFSA) for new and renewal applicants, and loan repayment and consolidation. The guide concludes with a glossary clarifying financial aid terminology and a complete list of state higher education agencies.

Last year, federal student aid helped approximately 10 million students meet the cost of higher education. For a copy of the 2006-07 guide, which is recommended for



current college students, visit www.edpubs.org or call 1-877-4ED-PUBS, with identification number EN0648P, while supplies last. (The 2007-08 version, suggested for high school students, will be available in December.) For the online version or to reach the Federal Student Aid Information Center, visit www.studentaid.ed.gov or call 1-800-4-FED-AID.

Think Summer!

Summer programs are an excellent way for precollege students to experience science, technology, engineering, mathematics, and medicine firsthand!

The Sloan Career Cornerstone Center, maintains a continually updated list of national summer programs in all of these fields. While many programs are offered through universities, several national programs are sponsored by

corporations or other groups at various U.S. locations. Some are targeted toward girls and underrepresented minorities. Examples of national programs are Destination Science Summer Camps, IBM EXITE Camps, Microsoft DigiGirlz, the Science and Engineering Apprentice Program at the US Office of Naval Research, and the Summer Internship Programs in Biomedical Research, from the National Institutes of Health.



Summer programs offer students an opportunity to explore career paths in many different fields.

Most universities offer one or more summer programs for local high school students. For state-by-state lists of summer programs for precollege students, visit www.careercornerstone.org/pcsumcamps.htm.

The Smell of Money

It's not hard to recall the pungent scent of a handful of pocket change. Similar smells emanate from a sweat-covered dumbbell or the water emerging from an old metal pipe. Yet no one has been able to identify the exact chemical cause of these familiar odors.

Now, researchers supported by the National Science Foundation and Germany's UFZ Environmental Research Center have shown that these odor molecules come not from the penny or the pipes, but from metal-free chemicals erupting into the air when organic substances like sweat interact with the metallic objects. The researchers -- Andrea

Dietrich, Dietmar Glindemann, Hans-Joachim Staerk and Peter Kusch, all from Virginia Tech -- believe the findings could help identify problem odors in potable water or aid doctors searching for disease markers in sweat or other body fluids.

"We are the first to demonstrate that when humans describe the 'metallic' odor of iron metal, there are no iron atoms in the odors," said Dietrich. "The odors humans perceive as metallic are really a body odor produced by metals reacting with skin."

One of the chemicals produced in the reaction is 1-octen-3-one, which has a mushroom-metallic smell and very



Researchers at Virginia Tech have found that the "metallic" smell of keys is not from the metal but from a reaction between the keys and your skin.

Credit: Rick Griffiths, Virginia Tech

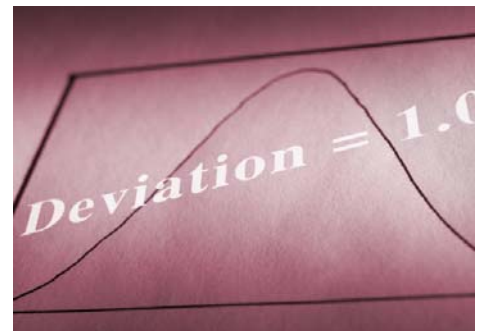
low odor threshold, meaning that humans can smell it in extremely minute concentrations. "This may have provided an evolutionary advantage that allowed early humans to track wounded comrades or prey," Dietrich added.

Degree Profile: Statistics

Statistics is the scientific application of mathematical principles to the collection, analysis, and presentation of numerical data. Statisticians contribute to scientific inquiry by applying their mathematical and statistical knowledge to the design of surveys and experiments; the collection, processing, and analysis of data; and the interpretation of the results. Statisticians may apply

their knowledge of statistical methods to a variety of subject areas, such as biology, economics, engineering, medicine, public health, psychology, marketing, education, and sports. Many economic, social, political, and military decisions cannot be made without statistical techniques, such as the design of experiments to gain Federal approval of a newly manufactured drug.

One technique that is especially useful to statisticians is sampling - obtaining information about a population of people or group of things by surveying a small portion of the total. For example, to determine the size of the audience for particular programs, television-rating services survey only a few thousand families,



rather than all viewers. Statisticians decide where and how to gather the data, determine the type and size of the sample group, and develop the survey questionnaire or reporting form. They also prepare instructions for workers who will collect and tabulate the data. Finally, statisticians analyze, interpret, and summarize the data using computer software.

Find out more about careers in statistics at www.careercornerstone.org/statistics/statistics.htm.



Leadership Makes a Difference

Leadership makes a difference, according to a new report from the National Association of Colleges and Employers (NACE). Employers responding to NACE's Job Outlook 2007 survey said that the job candidate who has held leadership positions has the edge over those with no such record. "When employers consider two equally qualified new college graduates for a position, what influences their decision about which candidate to choose? In our survey, employers reported that the candidate's having held a leadership position would influence the decision very much," says Marilyn Mackes, NACE executive director.



Nearly three-quarters of the employers responding to the NACE survey also expressed a preference for hiring candidates with relevant work experience.

For those in high school this means taking the time to volunteer on a community project, or organizing an event or program that benefits others. It can also mean participating in national programs and projects that allow students to work as a team toward a goal such as designing a new robot system or solving a mathematical challenge. At the college level, the study underscores how critical internships or coop programs can be to charting an early career path. Not only do these real-world work experiences give student a chance to explore different career paths, they also offer opportunities for college students to develop their personal leadership styles.

Many universities coordinate coop or internship opportunities for



students both during the school year and over summer break. For those considering different careers field, the three summer breaks during the college period offer an opportunity to work in different industries, or on different projects in one field.

The Sloan Career Cornerstone Center offers links to national programs and projects at the precollege level as well as resources for coop and internship programs for college students. Find out more at www.careercornerstone.org.

Career Cornerstone Explores Career Paths in...

- Actuarial Science
- Aerospace Engineering
- Agricultural Engineering
- Architectural Engineering
- Bioengineering
- Biology
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Engineering
- Computer Science
- Dentistry
- Electrical Engineering
- Engineering Technology
- Environmental Engineering
- Geosciences
- Industrial Engineering
- Manufacturing Engineering
- Materials Science and Engineering
- Mathematics
- Mechanical Engineering
- Medicine
- Mining Engineering
- Nuclear Engineering
- Nursing
- Petroleum Engineering
- Physics
- Software Engineering
- Statistics
- Veterinary Science
- - - and more to come...



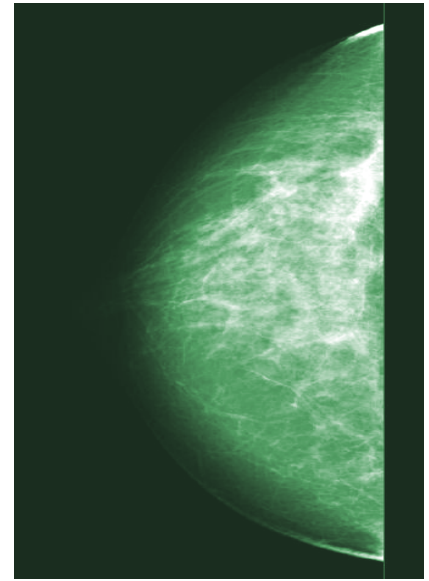
Find out more at www.careercornerstone.org

Advances in Tissue Imaging

A diagnostic device that resembles a mammography unit can detect tumors as tiny as one-fifth of an inch in diameter, which may make it a valuable complementary imaging technique to mammography, say researchers at Mayo Clinic, who helped develop the technology along with industry collaborators Gamma Medica and GE Healthcare. This new technique uses a new dual-head gamma camera system and is sensitive enough to detect tumors less than 10 millimeters (about two-fifths of an inch) in diameter in 88% of cases where it is used. Early findings from an ongoing comparison of the device with mammography show that it can detect small cancers that were not found with mammography, say the investigators.

"Our ultimate goal is to detect small cancers that may be inconspicuous or invisible on a

mammogram for high-risk women with dense tissue," says Mayo Clinic physicist Michael O'Connor, Ph.D. The investigators also say their device will likely be only slightly more expensive to use than mammography, and will be much more comfortable for women because much less pressure is needed to for a useful image. "We hope that our studies will eventually show our device to be almost as sensitive as magnetic resonance imaging (MRI), which is probably the best diagnostic test available to date, but is not widely used because of its expense," says Stephen Phillips, M.D., a Mayo radiologist and a study co-author. An MRI scan costs as much as ten times more than a traditional mammogram and involves injection of a contrast agent. Mammography uses low-dose X-rays (ionizing radiation) to create images of the anatomy of tissue. If the tissue is very dense, it can



only accurately help in tumor diagnosis in 30 to 50 % of cases, says Deborah Rhodes, M.D., another study co-author. Yet women who have dense tissue are four to six times more likely to develop cancer, and more functioning tissue is available in which disease can occur, she says.

Find out more about careers in medicine and bioengineering at www.careercornerstone.org.

Students to Fly On 'Weightless Wonder'

Thirty-four undergraduate student teams have been selected to fly and conduct experiments aboard NASA's "Weightless Wonder" reduced gravity aircraft this spring. The unique learning experience is part of NASA's Reduced Gravity Student Flight Opportunities Program. The program has given undergraduate teams the chance to research, design, fabricate, fly, and evaluate reduced gravity experiments annually since 1995.

The "Weightless Wonder" is a modified McDonnell Douglas DC-9 that conducts parabolic flights. The plane does a steep climb followed by an equally steep descent, producing about 18 to 25 seconds of weightlessness. Each team will have about 32 parabolas to run experiments, with gravitational forces ranging from zero gravity to Martian-like levels at one-third Earth's gravity. Four of the teams have been selected for the program's first lunar gravity flights. These experiments relate to areas of interest such as propulsion, areas that NASA is investigating as it prepares for future lunar missions. Lunar gravity is one-sixth that of Earth. Each proposal was evaluated for technical merit, safety and an outreach plan. Past proposals have included topics such as aviation, biology, medicine and communications. More details are at <http://microgravityuniversity.jsc.nasa.gov>.