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Career Cornerstone News

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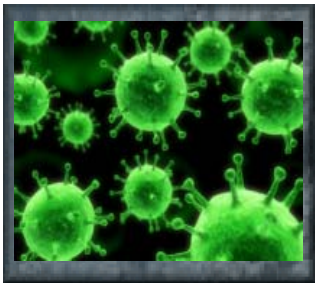


Career Cornerstone News is a Publication of the Sloan Career Cornerstone Center, the Premier Online Resource for Exploring Career Paths in Science, Technology, Engineering, Mathematics, Computing, and Healthcare.

Inside this issue:

Nursing Simulation Lab Opens

The University of Connecticut's School of Nursing recently opened a nursing simulation lab so nursing students can enhance their knowledge and skills. The new laboratory will enhance UConn's Master's Entry Into Nursing program, which is designed for individuals who have a bachelor's degree in a non-nursing field and now wish to pursue a career in nursing. The program allows students to become eligible to take the RN licensure exam after the successful completion of a calendar year of coursework. The new nursing simulation lab allow students to learn how to diagnose, treat, and respond to medical conditions and patient emergencies in a safe and supervised environment without any threat to human life.

Image Credit: University of Connecticut Photo by Peter Morenus

Using state-of-the-art computer equipment and advanced technology lifelike mannequins, the students are exposed to a variety of serious health conditions they will experience in actual clinical settings.

Healthcare will generate 3.2 million new wage and salary jobs between 2008 and 2018, more than any other industry. Find out more about careers in nursing and other areas in healthcare and medicine at www.careercornerstone.org.

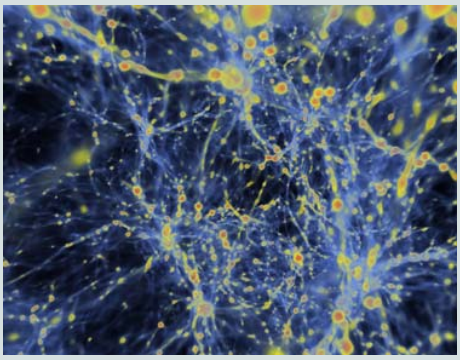
NCTL Supports Precollege Engineering Education

The National Center for Technological Literacy (NCTL) was established in 2004 to advance technological literacy by helping state governments modify their educational standards and assessments, designing standards-based, teacher-tested K-12 engineering materials, offering pre-service, in-service, and online professional development for educators, and creating museum exhibits and programs. NCTL is an initiative of the Museum of Science, Boston, which also offers many resources to students and teachers interest in science, technology, engineering and mathematics. The NCTL website (www.mos.org/nctl) offers information about NCTL curricula and professional development materials and provides individuals and organizations across the country with tools to advocate for technological literacy within their education systems. Explore links to this and other precollege programs and projects at www.careercornerstone.org.

Dealing with a Universe of Data

Modeling the evolution of the universe is no mean feat, not only because of the complex mathematics involved, but also because of the sheer amount of data that is generated from a working model of—well, the universe. A team of scientists at the U.S. Department of Energy's Argonne National Laboratory is working to develop software to manage the mountains of data and allow for real-time interactions. "Finding the resources and software capable of rendering volumes of data at such large scales can be a challenge," says Mark Hereld, visualization and analysis lead for Argonne's Leadership Computing Facility (ALCF). The facility is home to Eureka, one of the world's largest graphics supercomputers, which features 200 high-end graphics processing units. Eureka enables software such as vl3—a volume rendering toolkit developed at Argonne and the University of Chicago—that leverages graphics hardware to visualize such data sets in real time.

Networking advances make it feasible to move large amounts of data from the location where it was computed to specialized visualization resources where it can be rendered into images.



This visualization of the universe as it condenses around fluctuations in the density of dark and ordinary matter is a result from a collaboration between Argonne National Laboratory and the San Diego

Degree Profile: Diagnostic Medical Sonographer

Diagnostic imaging embraces several procedures that aid in diagnosing ailments. The most familiar procedures are the x-ray and the magnetic resonance imaging; however, not all imaging technologies use ionizing radiation or radio waves. Sonography, or ultrasonography, is the use of sound waves to generate an image for the assessment and diagnosis of various medical conditions.

Sonography commonly is associated with obstetrics and the use of ultrasound imaging during pregnancy, but this technology has many other applications in the diagnosis and treatment of medical conditions throughout the body.

Diagnostic medical sonographers use special equipment to direct nonionizing, high frequency sound waves into areas of the patient's body. Sonographers operate the equipment, which collects reflected echoes and forms an image that may be videotaped, transmitted, or photographed for interpretation and diagnosis by a physician.

Colleges and universities offer both 2- and 4-year programs in diagnostic medical sonography, culminating in an associate or a bachelor's degree. Two-year programs are most prevalent. Course work includes classes in anatomy, physiology, instrumentation, basic physics, patient care, and medical ethics.

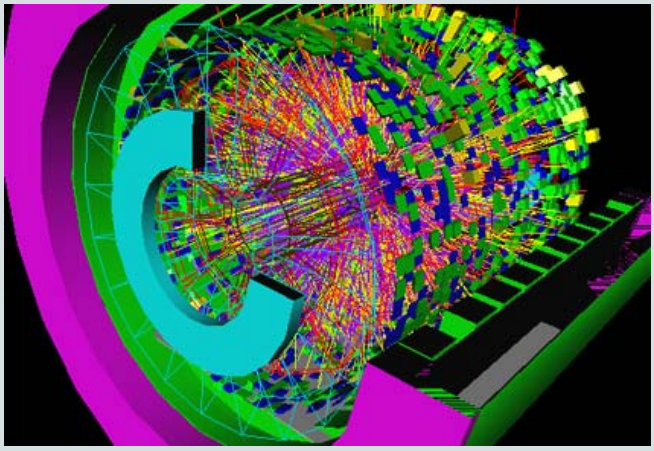
Diagnostic medical sonographers hold about 50,300 jobs in the United States. 59 percent of all sonographer jobs were in public and private hospitals. The remaining jobs were typically in offices of physicians, medical and diagnostic laboratories, and outpatient care centers. The median annual earnings of diagnostic medical sonographers is $61,980. Employment of diagnostic medical sonographers is expected to increase by about 18 percent through 2018 -- faster than the average for all occupations.

More details about a career as a diagnostic medical sonographer -- and other areas in medical technology -- are available at www.careercornerstone.org.

Measuring Matter Hotter than the Sun

Scientists have created an exotic state of matter with a temperature of four trillion degrees Celsius. It's the hottest temperature ever achieved in a laboratory and 250,000 times hotter than the heart of the sun. The team, which included three Vanderbilt University physicists, produced this super-heated state of matter by accelerating gold nuclei to nearly the speed of light in opposite directions and then colliding them in the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory -- the largest particle accelerator in the world dedicated to nuclear physics research. The new temperature measurement has strengthened the physicists' conviction that they have managed to recreate the quark-gluon plasma (QGP), a state of matter that may have existed fractions of seconds after the Big Bang.

For the last nine years, Vanderbilt physicists Victoria Green, Charles Maguire, and Julia Velkovska have played a key role in the design and operation of PHENIX, the largest of the four detectors positioned around the accelerator's 2.4-mile-circumference. "The temperature measurement was made at PHENIX by measuring the photons, the light particles, that were created with the plasma and escaped without interacting with other particles," says Greene, professor of physics and executive dean in the College of Arts and Science, who contributed to the paper reporting the result. RHIC scientists don't know the exact temperature at which the protons and neutrons in atoms "melt" into their constituent parts, quarks and gluons. But they do think it is considerably below four trillion degrees. Their observations of the most primordial of all primordial soups is improving scientists' understanding of the "strong force," the force that acts within the nucleus of the atom and holds it together.



A computer rendering of a collision of two beams of gold ions in the STAR detector at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory. The beams travel in opposite directions at nearly the speed of light before colliding. The PHENIX detector (below) records many different particles emerging from RHIC collisions, including photons, electrons, muons, and quark-containing particles called hadrons.
(Image Courtesy: Brookhaven National Laboratory)

Find out more about career paths in physics other fields at www.careercornerstone.org.

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NASA and Texas Instruments Develop Digital Libraries of Math and Science Problems

NASA and Texas Instruments are using the theme of human space exploration to develop digital libraries of math and science problems for high school students. The goal is to bring real-world topics in science, technology, engineering and mathematics, or STEM, into classrooms to spark students' excitement and interest in these critical career fields. The collaboration will produce two digital libraries. One, called "Exploring Space Through Math: Applications in High School Mathematics," will provide problems based on NASA data that are set in the context of space exploration. The project material will cover almost the entire high school math curriculum, with applications in Algebra 1, Geometry, Algebra 2, and Pre-Calculus. The other digital library, named "Science at Work: Exploring Space with NASA-AP," will contain questions for Advanced Placement classes. This program seeks to develop and test problems in calculus, statistics, physics, chemistry and biology. The libraries of questions will use NASA applications and data while incorporating Texas Instruments' math learning technology. Each problem includes student and teacher editions to help the teacher link content to higher concepts.

"Our goal is to make STEM subjects more fun and interactive," said Werner Garciano, director of Professional Development for Texas Instruments' Education Technology. "Working with NASA is a great opportunity to bring exciting, real-world math experiences into the classroom. Our collaboration will expand the digital content and professional development that Texas Instruments provides teachers, and will help engage students more deeply in math. Together, we believe these activities will break through to students who have never considered a STEM career path." Find out about over 185 STEM different career paths at www.careercornerstone.org.

Experience STEM Learning at Summer Camp

"Dr. Bernard A. Harris, Jr., the first African American to walk in space, and ExxonMobil recently announced that more than 1,500 middle school students will participate in free science camps this summer. “These camps help students explore beyond their horizons to encourage a life-long love of math and science and a better future.” The ExxonMobil Bernard Harris Summer Science Camps will be hosted in 30 universities across the country, and offers a two-week, free-of-charge experience. Students typically come from urban districts around the country and are recommended by their teachers based on leadership skills and science and mathematics aptitude. Since 2006, almost 4,000 students from across the country have attended ExxonMobil Bernard Harris Summer Science Camps. This is just one great example of a Summer STEM camp. Summer camps with a focus on science, technology, engineering, and mathematics (STEM) are available through many colleges, universities, corporations, and foundations across the U.S. For many students they are pivotal experiences that point to a career in these fields. The Sloan Career Cornerstone Center provides a continually updated listing of STEM summer camp programs at www.careercornerstone.org/pcsumcamps.htm. Check with your local college or university as well!