



TryEngineering Today!

The monthly newsletter of TryEngineering - find out more at www.tryengineering.org

Volume I, Issue II 2006 - October

Curious? Ask an Engineer!

TryEngineering.org offers a unique opportunity to send a question to an engineer for posted feedback on the site.

If you are interested in education, salary information, how their education prepared them, the work they do, the direction of a particular field -- or other question, just send a query to an engineer!

Be sure to ask about educational background, when they decided to become an engineer, how coops contributed to their educational experience, how much

travel is involved with their work, whether they have changed fields, and what sorts of projects they are working on.

TryEngineering.org will route your question to the best engineer based on your topic, who will provide an answer very quickly! After about a week, just check back on the website for your response.

SAE International provides support to TryEngineering by managing the "Ask an Engineer" section. So, just click on "Ask an Engineer" at



TryEngineering.org provides an opportunity to pose questions to engineer on all sorts of topics.

www.tryengineering.org and find out first hand what it is like to be involved in diverse world of engineering.

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Piezoelectric Crystal Research

Research into piezoelectricity has come a long way since first being demonstrated in 1880 using tinfoil, glue, wire, magnets, and a jeweler's saw. Recently, Dr. Yonghong Bing of Canada's Simon Fraser University broke new ground with her work on piezoelectric crystals.

Piezoelectricity is the ability of certain crystals to generate a voltage in response to applied mechanical stress.

Dr. Bing's research found that deforming piezoelectric crystals by subjecting them to externally applied voltage caused them to generate

short blips of relatively high-voltage electricity.

This deformation has useful engineering applications in producing and detecting sound, generating high voltages, generating electronic frequencies, and ultra-fine focusing of optical assemblies.





Lesson Plan: Cracking the Code

Each month, TryEngineering Today! profiles one of the many lesson plans available on TryEngineering.org.

Cracking the Code is a new lesson that focuses on how computerized barcodes have improved efficiency in product distribution. It also explores the barcoding process and how engineering design impacts so much of what we do.

The barcode has had a huge impact on retail, manufacturing systems, and distribution of products all over the

world. In addition, the little black and white lines have established a computerized database tracking buying habits, sales preferences, and pricing preferences for consumers everywhere.

The lesson explores the concept of how computerized barcoding has simplified distributing and pricing of products. Students learn about encoding and decoding, the barcoding system, and how a mathematical formula is embedded in barcoding to safeguard against errors. Students use websites to identify product barcodes, test

codes from everyday product, and work as an "engineering team" to come up with the next generation of information embedding systems.

Cracking the Code can be adapted for ages 8 - 18, and is aligned with education standards to allow teachers and students to apply engineering principles in the classroom. It includes both teacher and student handouts and worksheets.

Find out more at www.tryengineering.org/lesson.php.



U.S. Wind Energy Milestone

U.S. wind energy installations now exceed 10,000 megawatts (MW) in generating capacity, and produce enough electricity on a typical day to power the equivalent of over 2.5 million homes, according to the American Wind Energy Association. A megawatt of wind power generates enough to serve 250 to 300 average homes. The record growth in wind power is driven by demand for the

popular energy source and concerns over fuel price volatility and supply. It was also made possible by a timely renewal of the production tax credit, a U.S. incentive. The industry is gaining momentum as it grows.

The first commercial wind farms were constructed in California in the early 1980s, and after reaching 1,000 MW in 1985, it took more

than a decade for wind to reach the 2,000-MW mark, in 1999. Since then, however, installed capacity has grown fivefold. Today, the industry is installing more wind power in a single year (3,000 MW expected in 2006) than the amount operating in the entire country in 2000 (2,500 MW). More figures and statistics on the wind energy milestone are available at ww.awea.org.





Impact Landing on the Moon

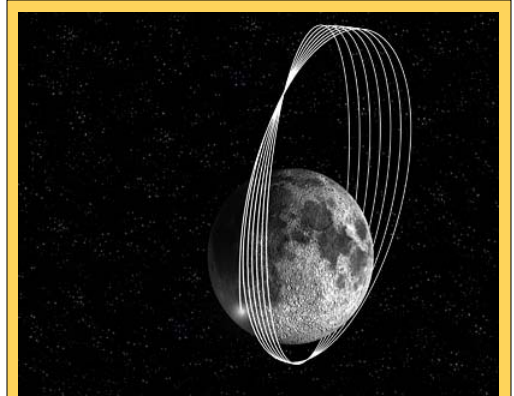
Early in September, a small flash illuminated the surface of the Moon as the European Space Agency's SMART-I spacecraft impacted onto the lunar soil, in the 'Lake of Excellence' region. SMART-I, (Small Mission for Advanced Research and Technology) is the first European mission to the Moon.

The planned impact concluded a successful mission that, in addition to testing innovative space technology, had been conducting a thorough scientific exploration of the Moon for about a year and a half.

SMART-I scientists, engineers and space operations experts confirmed the impact when ESA's New Norcia ground station in Australia lost radio contact with the spacecraft. SMART-I ended its journey in the Lake of Excellence, in the point situated at 34.4° South latitude and 46.2° West longitude. The SMART-I impact took place on the near side of the Moon, in a dark area just near the terminator (the line separating the day side from the night side), at a "grazing" angle of about one degree and a speed of about 2 kilometers per second.

For the last 16 months and until its final orbits, SMART-I has been studying the Moon, gathering data about the morphology and mineralogical composition of the surface in visible, infrared and X-ray light.

For more information, visit the European Space Agency at www.esa.int.



Trajectory of ESA SMART-I spacecraft in the final phase of its mission.

Credits: ESA - C. Carreau

Play the MRI Game

Did you ever wonder how a MRI machine works? MRI is an advanced imaging technique which is very useful in diagnosing certain diseases. It uses electromagnetic radiation to obtain images of soft tissues in a body, such as the brain or the spinal cord.

Over 60 million investigations with MRI

are performed worldwide each year. In 2003, MRI was awarded the Nobel Prize in Physiology or Medicine.

TryEngineering.org provides a link to an interactive internet game that lets visitors use a virtual MRI to diagnose a variety of illnesses and physical problems. MRI: The Magnetic Miracle points out which patients

are best suited for MRI and which diseases are best diagnosed through this technique. Try your hand at determining which patient should have an MRI and what the results show.

For the links to the MRI: The Magnetic Miracle and other engineering games, click on "Play Games!" at www.tryengineering.org.





Petaflops-Speed Supercomputer

Cray Inc. has announced that they have signed a multi-year contract with the U.S. Department of Energy's Oak Ridge National Laboratory to provide the world's first petaflops-speed (1,000 trillion floating-point operations per second) supercomputer.

The total contract, including systems and services, is valued at about \$200 million and calls for progressive upgrades to ORNL's existing Cray XT3™

supercomputer. This system will be upgraded to dual-core processors later this year, accelerating peak speed from 25 teraflops (25 trillion calculations per second) to 50 teraflops. Further upgrades will increase the performance to 100 teraflops, planned in late 2006, and to 250 teraflops, planned in late 2007.

ORNL is then expected to install a next-generation Cray supercomputer in late

2008. This system, currently code-named 'Baker,' is designed to deliver peak performance of one petaflops, making it roughly three times faster than any existing computer in the world.

Staff and guest researchers at ORNL use Cray supercomputers to explore the frontiers of neutron science, biological systems, energy production and advanced materials. Find out more at www.cray.com.



**TryEngineering
Today!**

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TryEngineering.org

is a resource for students (ages 8-18), their parents, their teachers and their school counselors. It is a portal about engineering and engineering careers, developed to help young people understand better what engineering means, and how an engineering career can be made part of their future.

It is brought to you by:



With the participation of:

