FIRST BELL

TODAY'S ENGINEERING AND TECHNOLOGY NEWS PREPARED EXCLUSIVELY FOR THE ENGINEERING AND TECHNOLOGY EDUCATION COMMUNITY

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## Leading the News

### Ford, University Of Detroit Mercy Develop Electric Vehicle Engineering Program.

The Detroit Free-Press (11/25) reports, "Ford Motor Co. and the University of Detroit Mercy announced Tuesday that they have developed a new seven-course advanced electric vehicle program to help Ford and other engineers develop the skills needed to build tomorrow's electric cars." Derrick Kuzak, Ford's group vice president of global product development, "said the industry's push toward electric vehicles is creating the most fundamental change in the automotive engineering world in at least 15 years," and that "as a result, engineers trained to develop and integrate the new systems used in electric vehicles are in high demand."

The Detroit News (11/25, Hoffman) reported that Ford and UDM "developed a graduate-level curriculum focusing on disciplines such as power electronics, energy management and power flow. Through this program, other academic offerings and in-house classes, Ford hopes to retrain some 2,000 of its engineers over the next decade." Kuzak "said his company's decision to take electric vehicles into the mainstream is creating more challenges for engineers than any development since electronic engine control computers were introduced." University of Detroit Mercy "has been working closely with Ford for some time to develop classes to train students in these emerging technologies. Leo Hanifin, dean of the College of Engineering and Science, said a curriculum for experienced engineers was the next logical step." Similarly, the News noted, "General Motors Co. has been working with the University of Michigan to develop a curriculum for training battery engineers."

The Wired (11/25, Borroz) "Autopia" blog reported, "The Advanced Electric Vehicle Program offers graduate-level courses emphasizing electric and hybrid drivetrain technology and components like power control and energy management systems." Ford already offers several hybrid models, "and it promises to have an all-electric Focus on the road by 2011 and a plug-in hybrid by 2012. The company says between 10 and 25 percent of its vehicles will be electrified - hybrids, plug-ins or battery electrics - by 2020." Wired noted that "the Advanced Electric Vehicle Program will be open to automotive engineers as well as engineers from defense industries."



## Higher Education

### Push For More Science Degrees Showing Success, NSF Survey Finds.

The Chicago Sun-Times (11/28) reports, "The National Science Foundation says that America's push to turn out more highly skilled

professionals armed with doctoral degrees in scientific and high-tech fields has made progress. In 2008, an NSF survey found, nearly 49,000 research doctorates were awarded, a 1.4 percent increase over 2007." The survey also found "that foreign students are accounting for a growing proportion of the Ph.D.s awarded by U.S. universities." Of those students, 78 percent "reported having definite job offers in the U.S. and intended to stay."

## Amid Recession, Top Students Flocking To Community Colleges.

The Washington Post (11/30, A1, De Vise) reports on its front page that an "increasing number of high school graduates" are bypassing top-ranked public and private universities "to become honor students at community colleges. Recession-wary students are flocking to selective two-year programs, which allow students to complete half of their college education for about $8,000, then transfer to a more prestigious four-year institution." The "influx of students with good test scores and multiple options for higher education is reshaping community colleges, a class of schools that, although open to all, have been stereotyped as a destination of last resort, sweeping up students with the least money and the weakest academic preparation."

## Northeastern Students Get Hydrogen-Powered Win In Chem-E-Car Competition.

The Boston Globe (11/30) reports, "A group of Northeastern University students showed the judges at a competition last week in Nashville how autos can make hydrogen under their hoods - thus eliminating the need to create a new nationwide network of hydrogen filling stations." The vehicle, dubbed the Aluminator, earned its creators first place at the annual Chem-E-Car competition. It "used aluminum foil and sodium hydroxide, and its onboard water supply, to produce its hydrogen fuel."

## University of Hawaii Engineering Program Receives Anonymous $1 Million Gift.

The Honolulu Advertiser (11/30) reports, "An anonymous donor has given the University of Hawai'i a $1 million gift that will allow its engineering program to bring world-class professors to the campus to teach." The gift "will support an endowed chair called the Dr. Alfred A. Yee Visiting Professorship in Civil and Environmental Engineering," and "will help pay the salary of an engineer who will teach undergraduate civil and environmental engineering." The Advertiser noted, "Yee is the president of Applied Technology Corporation in Honolulu."

### Research and Development

## Cottonseed, Engineered To Be Edible, Could Help Feed Developing Countries.

The AP (11/30) reports, Keerti S. Rathore, a researcher at Texas A&M University, "has found a way to reduce" a toxin called gossypol "in cottonseed that until now could only be eaten by cattle." The initiative "to neutralize" gossypol in the seeds has been around since the 1950s, "when scientists produced a gossypol-free plant by shutting off the gene that produces the toxin throughout the plant. But without gossypol, insects and diseases ravaged the cotton." Rathore, however, "found a way to shut off gossypol production in only the seeds, leaving stems, leaves, flowers and tissue protected." As a result, "the new seeds can be eaten by pigs, chickens, fish and humans and could show up in protein bars, shakes, breads, cookies and other foods within about 10 years. The amount of cotton already grown worldwide contains enough protein to feed 500 million people per year, researchers said."

## Researchers Increase Efficiency Of Coal Gasification By Adding CO2.

CNN (11/30, Ford) reports, "The world has taken a step closer to 'clean coal' thanks to new technology that actually uses CO2 to make power generation more efficient." Researchers at Columbia University "have shown that by actually adding CO2 into the mix and replacing some of the steam, the reaction becomes dramatically more efficient and much cleaner." Assistant professor Marco Castaldi said the technique has shown "efficiency savings of 25 to 30 percent." In the past, gasification "has demanded very large amounts of energy and water, and produced substantial CO2 emissions." Castaldi said, "This is what engineering does best, developing processes that can extract value from unwanted materials to help make the world a better place."

## Study Seeks To Improve Power Grid Cooperation.

The AP (11/30) reports Wayne Weaver, an assistant engineering professor at Michigan Technological University, "is leading a $350,000 study of how to keep power-hungry components from crashing smaller electrical grids." The study is being funded by the NSF, and "will apply game theory to developing mathematical models of electric power systems." According to Weaver, "communication and power-sharing among components will prevent crashes and allow the overall system to operate more efficiently."

## Nanotech Cocktail Could Halt Spread Of Cancer Cells.

The Arkansas Democrat Gazette (11/29, Dungan) reported that "researchers at the state's medical school and its land-grant university have discovered a way to magnetically trap tumor cells circulating in the bloodstream," findings that "might ultimately stop cancer's deadly metastasis and improve early diagnosis of the disease in its various forms." The researchers, from the University of Arkansas for Medical Sciences and the University of Arkansas at Fayetteville, "describe their technique as an intravenous injection of a 'cocktail' of magnetic and gold-covered carbon nanotubes containing a special biological coating into the bloodstream to target the moving cancer cells. An ordinary magnet attached to the skin near the injection site would then attract and capture the cells." However, "it likely would take awhile before the scientists could bring an actual application to market, as further testing must be done."

### Workforce

## Rhode Island Faces Shortage Of Biotech Workers, Study Finds.

The Providence Journal (11/30, Smith) reports, "There are 74,700 Rhode Islanders out of work, but leaders of one emerging industry - bioscience - say they can't find enough qualified applicants to fill vacant jobs." In fact, "about 56 percent of the state's bioscience companies, including those that work with pharmaceuticals, medical devices, research and agricultural feedstock, identified the lack of skilled workers as a top work-force challenge," a recent study found, with some companies reporting "that it can take up to a year to hire senior-level workers." The report found that "there are about 4,700 employees at bioscience companies in Rhode Island," and "bioscience professionals surveyed expected to see job growth of between 129 and 550 positions over the next two to three years." The report also "recommended expanding the programs, providing more scholarship funding, and aligning curriculums more closely with industry requirements."

### Industry News

## DuPont's "Unique" Seaweed Venture Nets DOE Cash.

The New York Times (11/25, Maron) reported a Greenwire story about a joint project between E.I. du Pont de Nemours & Co. and Seattle-based Bio Architecture Lab (BAL) to "explore seaweed's potential as a feedstock for biobutanol." The venture, which has "secured $9 million from the Department of Energy," seems "to have largely cornered the current market. Though more than 200 companies have looked into algae-based biofuels, DuPont and BAL say most others have shied away from using macroalgae, like kelp." Nikesh Parekh, CEO of Bio Architecture Lab, said that "part of the reason seaweed hasn't taken off as a biofuel source is that it's not part of American culture." The "unique" nature of the project is "why the companies were able to win one of DOE's Advanced Research Projects Agency-Energy (ARPA-E) awards, announced late last month, which are designed specifically for ambitious 'high-risk, high-payoff' energy research projects."

## Study: LED Bulbs Save Energy Over Entire Life Of The Bulb.

The New York Times (11/30, B6, Taub) reports that a comprehensive study conducted by Osram, a German light company, provides evidence that "the latest generation of energy-saving light bulbs save energy." Although that "may seem self-evident," until the release of the study, "no one knew if the production of LED lamps required more energy than needed for standard incandescent bulbs. While it is indisputable that LEDs use a fraction of the electricity of a regular bulb to create the same amount of light, if more energy were used in the manufacturing and distribution process, then the lighting industry could be traveling down a technological dead end." The study concluded that "over the entire life of the bulb -- from manufacturing to disposal -- the energy used for incandescent bulbs is almost five times that used for compact fluorescents and LED lamps." Kaj den Daas, chief executive of Philips Lighting North America, which "recently became the first entrant in the Energy Department's L Prize," said, "We welcome these kinds of studies," which provide "facts where we often have only emotional evidence."

## Executive: Sony TVs To Be Equipped With 3-D Features.

The AP (11/26, Kageyama) reported, "A third to a half of the Sony Corp. TV sets sold annually will be packed with 3-D features by the year ending March 2013," according to Sony Executive Deputy President Hiroshi Yoshioka. Yoshioka acknowledged on Thursday "that what Sony may really need for its money-losing TV business is its own display technology and the ability to make its own TV displays." The company "has fallen behind in flat-panel TV technology to rivals like Samsung Electronics Co. of South Korea," and Yoshioka conceded "that having to buy panels from Samsung was one reason why his Tokyo-based company lags in flat-panel TVs that use a new kind of backlight called LED - an innovation that can produce super-slim TVs and clearer images."

## BASF, Dow Compete For Buyers Of $10 Billion Styrene Units.

Bloomberg News (11/27, Weiss, Kaskey) reported, "BASF SE and Dow Chemical Co. are competing for buyers of styrene operations generating combined sales of $10 billion as factories in the Middle East squeeze profitability in basic plastics." BASF is negotiating "to form a styrene joint venture out of its unit generating" $4.5 billion in sales, "as a prelude to exiting the market, a company official with knowledge of the plan said Nov. 25. Dow is taking bids for its similarly sized unit, and is targeting a sale for the first quarter." The two chemical giants, Dow and BASF, "are retreating from a market increasingly dominated by Kuwait and the United Arab Emirates, where lower feedstock costs and the growing Chinese market are closer to hand. Europe's styrene industry will on average operate below the 85 to 90 percent factory run rate needed to make money in 2009, BASF styrenics vice-president Jaroslaw Michniuk said."

### Engineering and Public Policy

## New York To Receive $8 Million For Smart Grid, Energy-Storage Projects.

On its website, WSYR-TV Albany (11/27) reported, "New York State will receive more than $88 million in federal stimulus money" to support four projects. According to Gov. David A. Paterson's office, the New York projects "were competitively selected...with the goal of helping 'to build a smarter, more efficient, and more resilient electrical grid.'" The state's projects include the Secure Interoperable Open Smart Grid Demonstration, the Long Island Smart Energy Corridor, an Evaluation of Instrumentation and Dynamic Thermal Ratings for Overhead Lines, and a Compressed Air Energy Storage program. New York State has "pledged to match the awards to the four projects with money from the Innovation Economy Matching Grants Program up to 10% or a total of $8.8 million."

## Obama To Pledge 17% Cut In 2005 US Emission Levels By 2020.

AFP (11/27, Santini) reported President Obama "heads to Copenhagen needing to perform a delicate balancing act between huge expectations and the reality of a reluctant Congress." Obama will "travel to the Danish capital on December 9" to "offer to curb US emissions by 17 percent from 2005 levels by 2020 -- less than calls by the European Union, Japan and UN scientists -- but the first concrete numbers put on the table by the world's largest economy and second biggest polluter." But "analysts warn this is a risky gamble for Obama because the goals -- with longer-term pledges of a 30 percent reduction in emissions by 2025, 42 percent by 2030 and 83 percent by 2050 -- are conditional on action in Congress."

### Elementary/Secondary Education

## North Dakota Governor Honors West Fargo STEM Program.

North Dakota's In-Forum (11/25, Smith) reported that Gov. John Hoeven recently honored the program at West Fargo's STEM Center, "the first science, technology, engineering and math-based program" in North Dakota, and "said he wants more programs like West Fargo's to start in districts across the state." Hoeven also "proclaimed it statewide STEM Day." He was there to honor "about 30 of the center's sixth- and seventh-graders, who took second place at last month's Bison BEST robotics contest at North Dakota State University." Teacher Holly Erickson called the team "underdogs," and "not just because it's the first year of the STEM Center, but because these students were the youngest to compete and still topped nearly every one of the 24 high schools and programs from across North Dakota, South Dakota and Minnesota."

### Also in the News

## Celebrating 350th Anniversary, Britain's Royal Society Urges Wider Embrace Of Science.

The AP (11/30) reports that Britain's Royal Society "is marking its 350th anniversary in 2010 by putting more than 60 of its most important scientific papers online, alongside commentaries by modern scientists. The site -- http://trailblazing.royalsociety.org -- goes live Monday, launching a year of anniversary activities." The society "hopes to use the anniversary year to raise the profile of science as a vital part of Britain's cultural life. In the society's early years, science and art influenced one another," but "today, the two worlds rarely meet." Keith Moore, the Royal Society's head librarian, "said one of the society's goals was 'to get to the point where people are as comfortable talking about the latest developments in science' as about the last movie they saw." Moore said, "Newton, Franklin - these men have entered the popular consciousness. And it should be the same today."

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