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## **FUEL CELL CONNECTION - June 2007 Issue**

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## News on U.S. Government Fuel Cell Programs

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### 1. DOE-Funded Fuel Cell Ice Resurfacer Tours North American Rinks

A fuel cell-powered ice resurfacer, built with support from the U.S. Department of Energy, is touring ice rinks throughout the United States and Canada. The vehicle, called the eP-ICEBEAR, runs on hydrogen fuel. It was developed by a team of researchers from ePower Synergies Inc., Resurface Corporation and the University of North Dakota's National Center for Hydrogen Technology.

[http://www.fossil.energy.gov/news/techlines/2007/07045-ICEBEAR\\_Tours\\_US.html](http://www.fossil.energy.gov/news/techlines/2007/07045-ICEBEAR_Tours_US.html)

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### 2. SRNL Demonstrates Electrolyzer for Thermochemical Hydrogen Generation

DOE's Savannah River National Laboratory (SRNL) completed a successful 100-hour demonstration of a sulfur dioxide depolarized electrolyzer as a key component of the Hybrid Sulfur (HyS) thermochemical water-splitting process. The HyS Process is being developed, with funding from the DOE Office of Nuclear Energy, as a way of producing hydrogen using next-generation nuclear reactors.

[http://www.ornl.gov/info/news/pulse/pulse\\_v236\\_07.htm](http://www.ornl.gov/info/news/pulse/pulse_v236_07.htm)

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### 3. NIST to Test Residential SOFC System

The National Institute of Standards and Technology (NIST) will test a 5-kW tubular SOFC system, provided by Acumentrics Corporation, "to determine the seasonal performance of residential fuel cell systems for the development of a consumer-oriented performance rating." The NIST Residential Fuel Cell Test Facility will test other residential fuel cells as well, in order to develop a standard of rating their performance.

<http://www.acumentrics.com/7c2b1cbc-ae8c-412c-82bb-a74c3e9b0e3b/press-releases-release-details.htm>

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## RFP/Solicitation News

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### 4. Fuel Cell Technology Included in Building America Energy Efficient Housing Solicitation

Fuel cells and self-drying walls are among the examples of advanced technologies eligible under a new solicitation from the Department of Energy's Building America Program. Under this solicitation, industry teams will design and construct zero energy homes, which will then be evaluated while occupied. Approximately \$40 million to \$60 million is expected to be available, with individual awards in the \$10 million range for the total project period (up to 5 years). Deadline for proposals is July 31, 2007.

<https://e-center.doe.gov/iips/faopor.nsf/UNID/E3797DD9D93EECF2852572F90054BD2B?OpenDocument>

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### 5. ONR Solicitation Issued for Energy Technologies for DDG-51 Class Ships

The Office of Naval Research (ONR), through its Advanced Naval Power Systems program, issued a solicitation for technologies that have the potential to improve energy storage, power distribution and control, and power conversion efficiency aboard DDG-51 Arleigh Burke Class Destroyer ships. Individual project awards are expected to be between \$1 million and \$9 million, with a total estimated budget of \$9 million for the solicitation. Deadline for responses is September 25, 2007.

<http://www.fbo.gov/spg/DON/ONR/ONR/BAA07-029/listing.html>

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### 6. New Instructions for Advanced Coal Project Tax Credit Applications

DOE and the Treasury Department have announced new instructions for Advanced Coal Project Tax Credit applications. Eligible projects include gasification technologies that result in hydrogen or hydrogen-rich gas mixtures. Up to \$650 million of credits will be allocated to projects under this solicitation. The tax credit application deadline is October 31, 2007.

[http://www.fossil.energy.gov/news/techlines/2007/07050-DOE\\_Releases\\_Tax\\_Credit\\_Applicatio.html](http://www.fossil.energy.gov/news/techlines/2007/07050-DOE_Releases_Tax_Credit_Applicatio.html)

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*7. International Finance Corporation Solicits Fuel Cell Proposals*

The International Finance Corporation (IFC), the private sector affiliate of the World Bank Group, is considering proposals for turnkey stationary fuel cell installations through its Fuel Cell Financing Initiative. The Initiative, funded by the Global Environmental Facility, is a two-stage program. Stage one will provide up to \$9 million for a maximum three commercial demonstration projects using fuel cells for distributed power generation. Stage two has an allocation of up to \$45 million in additional funding. Proposals will be evaluated on a rolling basis, beginning June 30, 2007, for a period of 18 months.

[http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/RFP\\_FuelCells/\\$FILE/FCFI+RFP+052507.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/RFP_FuelCells/$FILE/FCFI+RFP+052507.pdf)

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**Contract / Funding Awards**  
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*8. DOE Awards \$19 Million for Advanced Vehicle Technologies*

DOE has awarded \$19 million in funding to five research projects to develop technologies for fuel cell vehicles, hybrid electric vehicles and plug-in hybrid electric vehicles. Projects include development of a combined traction motor and power electronic inverter.

<http://www.energy.gov/news/5078.htm>

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**State Activities**  
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*9. Iowa Establishes \$100 Million Power Fund*

Iowa Governor Chet Culver signed legislation establishing a \$100 million Iowa Power Fund, which aims to invest in cutting edge R&D on renewable energy, energy efficiency, and biofuels. The new law creates an Office of Energy Independence, which will develop a plan for the state's achievement of independence from foreign energy sources by 2025.

[http://www.governor.iowa.gov/news/2007/05/23\\_1.php](http://www.governor.iowa.gov/news/2007/05/23_1.php)

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*10. Minnesota Sets Goal for Cutting Energy Consumption*

A new law in Minnesota sets a goal for the state to cut its energy consumption by 25 percent by 2025. The Next Generation Energy Act of 2007 also aims to reduce the state's greenhouse gas emissions by 15 percent by 2015, 30 percent by 2025, and 80 percent by 2050. Up to \$3.6 million may be allotted annually for applied research and development grants for projects to conserve energy. Public utilities that own nuclear generation facilities in the state are required to annually give funding to the University of Minnesota Initiative for Renewable Energy and the Environment, for the development of renewable energy sources and technologies, including hydrogen fuel cell technologies and hydrogen production technologies.

<http://www.revisor.leg.state.mn.us/bin/bldbill.php?bill=S0145.2.html&session=ls85>

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*11. Florida Celebrates Opening of State's First Hydrogen Demonstration Station*

Florida's first hydrogen demonstration station is now open for operation and will fuel hydrogen-powered shuttle buses for the Orlando International Airport and the Orange County Convention Center. The Boggy Creek Hydrogen Fueling Station resulted from collaboration between the State of Florida, Ford Motor Company, Chevron Technology Ventures and Progress Energy. <http://www.flgov.com/release/9016>

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**Industry Headlines**  
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*12. Hilton New York Installs Fuel Cell*

As part of the Hilton Hotels Corporation's global environmental program, the Hilton New York property has installed a PureCell™ Model 200 fuel cell power system, fueled by natural gas, to provide power and domestic hot water for hotel operations. The system is set up to operate even if the power grid goes down. <http://phx.corporate-ir.net/phoenix.zhtml?c=88577&p=irol-newsArticleOther&ID=1010566&highlight=>

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*13. MTI Micro Announces Advanced Mobion® Fuel Cell Chip*

MTI MicroFuel Cells demonstrated an advanced integrated fuel cell chip that is used as the heart of its fuel cell systems for consumer products. The new Mobion® chip architecture reduces fuel cell complexity and allows the system to run in a wide range of environments, including temperatures from 0°C to 40°C (32°F to 104°F) at any humidity level. [http://www.newsandearnings.com/ViewFile.asp?ID1=24680&ID2=117972570&ssid=3&directory=4935&bm=0&filename=20070605\\_cell\\_release\\_final.pdf](http://www.newsandearnings.com/ViewFile.asp?ID1=24680&ID2=117972570&ssid=3&directory=4935&bm=0&filename=20070605_cell_release_final.pdf)

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*14. DMFCC Files Patent Application for Tamper Resistant Fuel Cartridges*

Direct Methanol Fuel Cell Corporation (DMFCC) filed a patent application for tamper resistant fuel cartridges for fuel cells. The company notes that fuel cells are being developed for portable consumer applications such as notebook computers and personal digital assistants (PDAs) where fuel cartridges containing methanol must be safe to handle and resistant to access by children. [http://www.viaspace.com/press\\_content.asp?id=1138](http://www.viaspace.com/press_content.asp?id=1138)

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*15. SOFC Validated for Hybrid Automotive Application*

A bench-top study by an engineering team at Imperial College London has validated use of a solid oxide fuel cell, in combination with an advanced battery, in hybrid engine applications for commercial trucks. The ABSOLUTE Hybrid prototype engine paired a 300-Watt fuel cell stack from Versa Power Systems with a sodium nickel-chloride battery. The simulation showed the fuel cell stack experiencing shocks exceeding 14 times the force of gravity without harming its ability to generate electricity. [http://www.versa-power.com/news/Versa\\_Power\\_Auto\\_Hybrid\\_26-06-07.pdf](http://www.versa-power.com/news/Versa_Power_Auto_Hybrid_26-06-07.pdf)

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**University Activities**  
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*16. Contest Challenges University Students to Design Hydrogen Applications for Airports*

The Hydrogen Education Foundation, which is supported in part by the Department of Energy, announced this year's Hydrogen Student Design Contest theme is "Hydrogen Applications for Airports." The contest gives multi-disciplinary teams of university-level students from around the world the opportunity to develop innovative design concepts using hydrogen and fuel cell technologies. Entries are due by December 7, 2007.

<http://www.hydrogencontest.org/rules.asp>

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#### 17. University Fuel Cell Roundup

(summaries contributed by Kathy Haq, Dir. of Outreach and Communications, National Fuel Cell Research Center, UC Irvine, [khaq@nfcrc.uci.edu](mailto:khaq@nfcrc.uci.edu))

Scientists at the Chulalongkorn University and Thailand's National Metals and Materials Technology Center have discovered that an 80/20 Pyrex glass/YSZ composite material is the most promising sealant for solid oxide fuel cells. The team concluded that glass-ceramic composite materials sealed better than ceramic adhesives with a low leakage rate. A report titled "Study of Ceramic Seal for Solid Oxide Fuel Cells" has been published online in the materials journal *AZojomo*. <http://www.azom.com/Details.asp?ArticleID=3834> [20-June-2007, *Hydrogen Daily*]

George Harker — a senior business development, marketing and technical professional — has been named associate vice president for technology transfer, engineering and physical sciences and executive director of the Wright Fuel Cell Group at Case Western Reserve University. Harker comes to Case from the Georgia Institute of Technology in Atlanta, where he served as director of the Office of Technology Licensing and assistant vice provost for economic development and technology ventures. [http://www.wrightfuelcellgroup.org/fuel\\_cell-news-events.shtml#press](http://www.wrightfuelcellgroup.org/fuel_cell-news-events.shtml#press)

In Indiana, Valparaiso University researcher Robert Palumbo, professor and chairman of mechanical engineering, hopes to capture and store the sun's energy using mirrors to concentrate sunlight. The super hot rays would heat solar chemical reactors to temperatures reaching 4,000 degrees Fahrenheit. In the extreme heat, both water and zinc oxide break down, creating simple hydrogen and zinc — in other words, storing sunlight as chemical energy. Both of these elements can be used to produce fuel which can then be contained in fuel cells and easily transported wherever and whenever power is needed.

[http://www.valpo.edu/valpo\\_people/palumbo.php](http://www.valpo.edu/valpo_people/palumbo.php) Valparaiso is working with the Department of Chemical Engineering and Materials Science at the University of Minnesota and with Deutsches Zentrum Fur Luft-und Raumfahrt in Germany where he and his students hope to test cells and a solar reactor they plan to build. See related story in the *Post-Tribune* [http://www.post-trib.com/news/404517\\_pcsolar.article](http://www.post-trib.com/news/404517_pcsolar.article).

Martin A. Abraham, dean of the College of Graduate Studies at the University of Toledo, has been named the founding dean of Youngstown State University's new College of Science, Technology, Engineering and Mathematics. Abraham is a member of the Board of Directors of the Ohio Fuel Cell Coalition. "Dr. Abraham brings to the position a distinguished and balanced record of publication, teaching and service," said Peter Kasvinsky, dean of the School of Graduate Studies and Research and interim dean of the Rayen College of Engineering and Technology. "He is a chemical engineer, and his research involving hydrogen fuel cell catalysts has both applied and basic components. Because of these qualifications, his expertise provides a strong bridge between engineering and the basic science departments of the new College of STEM." [http://cfweb.cc.ysu.edu/news/news\\_viewnew.cfm?RecNum=591](http://cfweb.cc.ysu.edu/news/news_viewnew.cfm?RecNum=591)

A team of scientists representing several universities in England has developed a compound of the element lithium that might make it practical to store enough hydrogen on-board fuel cell-powered cars so they can be driven more than 300 miles before refueling. The breakthrough was achieved by a team from the Universities of Birmingham and Oxford and the Rutherford Appleton Laboratory in Oxfordshire under the auspices of the UK Sustainable Hydrogen Energy

Consortium (UK-SHEC). UK-SHEC is funded by the SUPERGEN (Sustainable Power Generation and Supply) initiative managed and led by the Engineering and Physical Sciences Research Council (EPSRC). The UK-SHEC research focused on a well-established process called "chemisorption" in which atoms of a gas are absorbed into the crystal structure of a solid-state material and then released when needed. The team tested thousands of solid-state compounds in search of a light, cheap, readily available material that would enable the absorption/desorption process to take place rapidly and safely at typical fuel cell operating temperatures. They have now produced a variety of lithium hydride (specifically Li4BN3H10) that could offer the right blend of properties. Development work is now needed to further investigate the potential of this powder. [30-May-2007, *Space Daily, Distributed by United Press International*]

Five teams from four schools competed in the recent Fuel Cell Challenge at Pennsylvania College of Technology. The Fuel Cell Challenge is a successor to a once-popular campus contest in which participants fashioned vehicles powered solely by the snap of a mousetrap. This latest incarnation involves vehicles fueled by the energy that results from electrolysis, the separation of water into hydrogen and oxygen. In the May 22 event, students took a written test in the morning and then put their fuel cell-powered vehicles through a variety of road tests in the Field House. Among the categories were distance, speed, engineering, load pull, hill climb and fuel management. The winning team from Williamsport Area High School is now eligible to compete as one of three U.S. teams in the International Youth Fuel Cell Competition, to be held Oct. 12-18 in San Antonio, Texas. [http://live.psu.edu/index.php?sec=vs\\_highlight&story=24593&highlight=1](http://live.psu.edu/index.php?sec=vs_highlight&story=24593&highlight=1)

Daniel Katz is one of four students from one school — Long Island's Machon HaTorah yeshiva high school — to win a divisional first prize at this year's Intel International Science and Engineering Fair in Albuquerque, New Mexico. The Intel ISEF, held in May, is the world's largest pre-college celebration of science, bringing together more than 1,500 regional finalists from over 50 nations to compete for scholarships, tuition grants, internships, and scientific field trips. This year marked the fair's 27th year. Katz's project, "Platinum Nanoparticles: From hydrogen storage to cancer treatment," won the \$3,500 first-place prize in the materials and bioengineering category. Daniel also won an \$8,000 Navy and Marine Corps scholarship, a \$500 American Vacuum Society award, and an award from the Patent Office. Daniel developed a mechanism of targeting cancer cells by creating a new method of synthesizing nanoparticles that are highly toxic once ingested by cancer cells while being generally harmless to normal somatic cells. This nanotherapy would potentially eliminate many of the adverse side effects of current forms of chemotherapy. In addition, Daniel demonstrated that these nanoparticles store a great amount of hydrogen gas that can be released for use to power a hydrogen fuel cell, creating a safer source of storing hydrogen for generating electricity. <http://www.5tjt.com/news/read.asp?id=1228>

The Connecticut Global Fuel Cell Center in the School of Engineering at the University of Connecticut is advertising for a new director. The center was established in 2001 with significant investment from Connecticut Innovations, Inc. and Connecticut industry. It is housed in a 16,000-square-foot facility on the Storrs campus. Recruiting will continue until the position is filled. For more information, see [http://www.ctfuelcell.uconn.edu/cgfcc\\_openings\\_director.htm](http://www.ctfuelcell.uconn.edu/cgfcc_openings_director.htm).

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**Administration**  
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Press releases and story ideas may be forwarded to Bernadette Geyer, editor, for consideration at [fuelcellconnection @ yahoo.com](mailto:fuelcellconnection@yahoo.com).

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## **The Sponsors**

*US Fuel Cell Council* -- The US Fuel Cell Council is the business association for anyone seeking to foster the commercialization of fuel cells in the United States. Our membership includes producers of all types of fuel cells, as well as major suppliers and customers. The Council is member driven, with eight active Working Groups focusing on: Codes & Standards; Transportation; Power Generation; Portable Power; Stack Materials and Components; Sustainability; Government Affairs; and Education & Marketing. The Council provides its members with an opportunity to develop policies and directions for the fuel cell industry, and also gives every member the chance to benefit from one-on-one interaction with colleagues and opinion leaders important to the industry. Members also have access to exclusive data, studies, reports and analyses prepared by the Council, and access to the "Members Only" section of its web site. (<http://www.usfcc.com/>)

*National Fuel Cell Research Center* -- The mission of the NFCRC is to promote and support the genesis of a fuel cell industry by providing technological leadership within a vigorous program of research, development and demonstration. By serving as a locus for academic talent of the highest caliber and a non-profit site for the objective evaluation and improvement of industrial products, NFCRC's goal is to become a focal point for advancing fuel cell technology. By supporting industrial research and development, creating partnerships with State and Federal agencies, including the U.S. Department of Energy (DOE) and California Energy Commission (CEC), and overcoming key technical obstacles to fuel cell utilization, the NFCRC can become an invaluable technological incubator for the fuel cell industry. (<http://www.nfcrc.uci.edu/>)

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