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**FUEL CELL CONNECTION - December 2008 Issue**  
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## News on U.S. Government Fuel Cell Programs

### 1. ORNL Report Projects Benefits of CHP Deployment

According to a new report from Oak Ridge National Laboratory (ORNL), if 20% of the United States' generating capacity came from combined heat and power (CHP) sources, benefits would include annual fuel savings of 5.3 quadrillion Btu and creation of 1 million new jobs through 2030. The report also projects a 60% reduction of the projected increase in CO2 emissions by 2030.

[http://apps1.eere.energy.gov/news/progress\\_alerts.cfm/pa\\_id=131](http://apps1.eere.energy.gov/news/progress_alerts.cfm/pa_id=131)

### 2. City of Burbank to Test Market Fuel Cell Plug-In Hybrid Transit Bus

The City of Burbank will be the site of the national test market for a new hybrid transit bus featuring both fuel cell and plug-in power technologies. A 50-kW hydrogen fuel cell will be used as a range extender for the plug-in hybrid bus. Other participants in the project include the Federal Transit Administration and the California Air Resources Board.

<http://news.prnewswire.com/ViewContent.aspx?ACCT=109&STORY=/www/story/12-17-2008/0004943680&EDATE=>

### 3. FTA Update Details Progress on Fuel Cell Bus, Vehicle Research Projects

The November 2008 issue of the Federal Transit Administration (FTA) *Transit Research Update* reports on the Delaware Automotive Fuel Cell Vehicle Consortium as well as the Connecticut Transit Fuel Cell Bus Program and the SunLine Transit Agency Hydrogen-Powered Transit Bus Project. The FTA *Update* also features information about the hydrogen technology validation projects at the National Renewable Energy Laboratory.

[http://www.fta.dot.gov/assistance/research\\_7051.html](http://www.fta.dot.gov/assistance/research_7051.html)

### 4. EPA NCER Issues Notice of Willingness to Participate in Joint Assistance Applications

The Environmental Protection Agency (EPA) National Center for Environmental Research (NCER) has issued a notice that its researchers may be available to participate with eligible institutions to prepare joint assistance applications for Funding Opportunities issued by other federal agencies. Potential partners may view the NCER criteria for participation, eligibility requirements, limitations and additional information in a recently revised "participation policy document" available online. <http://es.epa.gov/ncer/guidance/partpolicy.pdf>

### 5. President-Elect Obama Nominates LBNL Director Steven Chu for Energy Secretary

President-elect Barack Obama has nominated Lawrence Berkeley National Laboratory (LBNL) Director Steven Chu to be Secretary of Energy. Chu is a Nobel laureate physicist and is Professor of Physics and Molecular and Cell Biology at the University of California, Berkeley.

<http://www.lbl.gov/Publications/Director/>

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RFP/Solicitation News
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**6. DOE Issues Second Solicitation to Fund Entrepreneurs-in-Residence**

The U.S. Department of Energy (DOE) issued a second solicitation to fund entrepreneurs-in-residence at national laboratories. Five new awards of \$50,000 each will be selected from among capital venture firm applicants for 1-year projects to identify and develop business cases for promising lab technologies developed under the DOE Offices of Science and Energy Efficiency and Renewable Energy. The five labs participating in this solicitation are Argonne National Laboratory, Brookhaven National Laboratory, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, and Pacific Northwest National Laboratory. Applications are due January 6, 2009. <https://e-center.doe.gov/iips/faopor.nsf/UNID/34F6742B2E3CC4AE8525752700640A33?OpenDocument>

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**7. TVA Seeks Proposals for Renewable Energy, Clean Energy Resources**

The Tennessee Valley Authority (TVA) has issued a Request for Proposals for Renewable Energy and/or Clean Energy Resources (RECER), including CHP, landfill gas and other biologically derived methane gas. TVA is looking to obtain both "Dispatchable" and "As-Available" capacity. Contractual delivery periods of up to 20 years will be considered. Proposals are due January 16, 2009. <http://www.tva.gov/>

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**8. CARB Funding Available for Hydrogen Generation, Storage Technology Research**

The California Air Resources Board (CARB) has issued a Research Concept Solicitation that includes hydrogen generation and storage technologies among eligible project topics in its Technology Advancement and Pollution Prevention area of research interest. Prospective applicants are encouraged to review previously funded projects for an idea of typical budget size. A "research concept template" is due from applicants by January 20, 2009. <http://www.arb.ca.gov/research/apr/plan/concepts/concepts09-10.htm>

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**9. PIER Solicitation to Support Renewable-Based Energy Secure Communities**

The California Energy Commission, through its Public Interest Energy Research (PIER) Program, has issued a solicitation for Renewable-Based Energy Secure Communities (RESCO) Technical Integration and Collateral Category Projects. The solicitation will fund projects that enable effective use of "geographically convenient" renewable energy sources in California. A total of \$9.1 million is available through this solicitation with maximum funding levels ranging between \$200,000 and \$2.0 million, depending on the type of project (Exploratory, Pilot, Implementation, etc.). The deadline for proposals is January 30, 2009. <http://www.energy.ca.gov/contracts/PON-08-004/>

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**10. Solicitation Released for PIER EISG Program for Natural Gas**

The California Energy Commission Energy Innovations Small Grant (EISG) Program for Natural Gas has issued a solicitation to fund energy research, development and demonstration projects to provide benefit to California electric and gas ratepayers. A per-project maximum of \$95,000 is available for hardware projects requiring physical testing and \$50,000 for modeling projects. Pre-proposal abstracts are optional, and may be submitted through January 14, 2009. Grant applications are due February 11, 2009. [http://www.energy.ca.gov/contracts/smallgrant/08-01G\\_natural\\_gas/index.html](http://www.energy.ca.gov/contracts/smallgrant/08-01G_natural_gas/index.html)

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**11. CHP and CCHP Projects Sought by PIER Solicitation**

The California Energy Commission Public Interest Energy Research (PIER) Program issued a Combined Heat and Power and Combined Cooling, Heating, and Power Systems (CHP and CCHP) solicitation to support research, development and demonstration projects that closely integrate with "prime movers" such as fuel cells, engines and turbines. An estimated \$3.8 million is available for this solicitation with maximum project awards of \$1.5 million. Three to five projects are expected to be selected under this solicitation. A pre-proposal workshop is scheduled for January 7, 2009, and the deadline for proposals is March 19, 2009.

<http://www.energy.ca.gov/contracts/PON-08-005/>

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Contract / Funding Awards
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*12. Battelle Receives \$2 Million from Air Force for Fuel Cell Commercialization*

Battelle received a \$2 million grant from the Air Force for a fuel cell commercialization project. Battelle has awarded a \$200,000 subcontract to the College of Technology at Kent State to conduct the development and commercialization phase of the project.

<http://www.kent.edu/media/2008newsreleases/Battelle-Air-Force-Contract.cfm>

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*13. ONR Awards \$1.2 Million to Advance Direct-Methanol Fuel Cell Development*

The Office of Naval Research (ONR) awarded a \$1.2 million follow-up contract to Neah Power Systems for continued development of the company's direct-methanol fuel cell. ONR's first contract to Neah Power was awarded in 2007.

[http://www.neahpower.com/media\\_pr\\_112508.html](http://www.neahpower.com/media_pr_112508.html)

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*14. DOE Funds Hydrogen Research at Clemson University, Savannah River National Lab*

DOE's Office of Basic Energy Science has awarded \$409,000 to Clemson University researchers, in collaboration with Savannah River National Laboratory, for a project to develop a new polymer membrane for use in high-temperature hydrogen production. The funding is part of DOE's Experimental Program to Stimulate Competitive Research (EPSCoR).

[http://www.clemson.edu/newsroom/articles/top-stories/nuclearpolymermembrane\\_research.php5](http://www.clemson.edu/newsroom/articles/top-stories/nuclearpolymermembrane_research.php5)

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*15. Membrane Development Project Selected as University Coal Research Program Awardee*

A project to develop gas separation membranes at the University of Texas at Dallas is one of six receiving funding through the DOE University Coal Research Program. Researchers at the University of Texas received \$299,974 to prepare novel mixed-matrix membranes and to use the membranes to evaluate separations important to coal gasification, including hydrogen gas separation.

[http://www.fossil.energy.gov/news/techlines/2008/08061-DOE\\_Selects\\_University\\_Projects.html](http://www.fossil.energy.gov/news/techlines/2008/08061-DOE_Selects_University_Projects.html)

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*16. DOE Awards \$200,000 for Hydrogen Project in HBCU/OMI Program*

DOE's Office of Fossil Energy has awarded \$200,000 to North Carolina A&T State University for a project to investigate steam reforming of methanol for hydrogen production. The project is one of four receiving funding through DOE's Historically Black Colleges and Universities and Other Minority Institutions (HBCU/OMI) Program.

[http://www.fossil.energy.gov/news/techlines/2008/08064-Minority\\_Universities\\_Receive\\_Gran.html](http://www.fossil.energy.gov/news/techlines/2008/08064-Minority_Universities_Receive_Gran.html)

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*17. Central Grocers Contracts Plug Power for Delivery of 220 GenDrive™ Fuel Cell Units*

Central Grocers, Inc. selected Plug Power to provide 220 GenDrive™ fuel cell units to power the entire lift truck fleet at the company's new distribution center, which is currently under construction in Joliet, Illinois. In using fuel cell lift trucks, Central Grocers eliminated the need to invest in a battery charging and changing infrastructure. Central Grocers also selected Air Products to supply the hydrogen fueling infrastructure for the trucks.

<http://www.b2i.us/View.asp?b=604&ID=60954&I=204573>

<http://www.airproducts.com/PressRoom/CompanyNews/Current/AreaOfInterest/Markets/HydrogenEnergy/11Dec2008.htm>

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*18. Air Force Awards Fuel Cell Membrane Research Award to Indian Institute of Science*

The Air Force has awarded a \$121,200 contract to the Indian Institute of Science for a project to develop novel composite membranes for fuel cells and related applications.

[https://www.fbo.gov/index?s=opportunity&mode=form&id=2ed93e5c94041b6b7134e6afc20c2472&tab=core&\\_cview=1](https://www.fbo.gov/index?s=opportunity&mode=form&id=2ed93e5c94041b6b7134e6afc20c2472&tab=core&_cview=1)

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Legislative/Regulatory News
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*19. CARB Approves Climate Change Scoping Plan to Reduce Greenhouse Gas Emissions*

The California Air Resources Board (CARB) approved a "scoping plan" to reduce the state's greenhouse gas emissions to 1990 levels by 2020. The plan recommends a cap-and-trade program to address 85% of the emissions, as well as measures related to energy efficiency and renewable energy. CARB must now develop detailed strategies to implement the recommended measures, which are required by the state's Global Warming Solutions Act of 2006 to be in place by 2012. <http://www.arb.ca.gov/newsrel/nr121108.htm>

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*20. CEC Draft Report Says Funding is Needed for State Hydrogen Infrastructure Objectives*

The California Energy Commission (CEC) published a draft "Investment Plan for the Alternative and Renewable Fuels and Vehicle Technologies Program," which includes gap analysis and recommendations for hydrogen infrastructure projects. The draft report concludes that funding is needed to "support implementation of high-volume fleet and retail hydrogen fueling stations strategically located to serve early market vehicles" and to "promote mixed-use hydrogen fuel infrastructure to support transit fuel cell buses, possible hydrogen/compressed natural gas blending for transit buses, light-duty vehicle fleets, and other applications." An Advisory Committee meeting is scheduled for January 8, 2009, to discuss the draft plan. Audio and presentations from the meeting will be broadcast over the internet for those who cannot attend.

<http://www.energy.ca.gov/proceedings/2008-ALT-1/documents/index.html#010809>

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Industry News
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*21. Universal Charger Set for 2009 Launch Uses Fuel Cell, Swappable Fuel Cartridge*

MTI Micro announced plans for a 2009 launch of a new universal charger that provides 25 Watt-hours of power from a fuel cell and features an easily swappable methanol fuel cartridge. The charger includes a USB interface, enabling use as an independent energy source for a variety of hand-held electronic devices. <http://www.mtimicrofuelcells.com/news/article.asp?id=348>

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University Activities
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**22. SERC Reports on Hydrogen, Fuel Cell Projects**

The latest issue of *Energy News* from Humboldt University's Schatz Energy Research Center (SERC) reports on the status of the Center's hydrogen and fuel cell projects. SERC is supporting AC Transit in the implementation of hydrogen fuel cell transit buses, providing consultation and safety analyses services for a new hydrogen fueling station at the agency's Emeryville transit facility. SERC also reports on the status of its development of hydrogen curriculum and teaching tools as part of projects for DOE and in cooperation with the Lawrence Hall of Science at the University of California-Berkeley. [http://www.schatzlab.org/docs/v3n4\\_dig\\_sm.pdf](http://www.schatzlab.org/docs/v3n4_dig_sm.pdf)

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**23. 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))

The World Intellectual Property Organization (WIPO) on Oct. 9 assigned Patent Publication No. WO/2008/121209 to Fordham University for a photocatalytic electrode and fuel cell invented by John J. McMahon of Bronx, N.Y. "The invention includes an electrode comprising an electrically conductive material having a roughened surface capable of producing surface enhanced Raman scattering of incident light from an adsorbate material adsorbed on the surface of the electrode," according to the description filed with WIPO.

<http://www.wipo.int/pctdb/en/ia.jsp?ia=US2008/003170>

Australia's Curtin University of Technology announced Oct. 29 that it was awarded US\$180,000 from Russian aluminum giant Rusal in a competition to develop new applications for the light metal. Professor Craig Buckley, who heads Curtin's Hydrogen Storage Research Group in the University's Department of Imaging and Applied Physics, said his team will pursue the use of aluminum in hydrogen storage for fuel cell vehicles.

[http://campusnews.curtin.edu.au/media\\_centre/archives.cfm?release=6723](http://campusnews.curtin.edu.au/media_centre/archives.cfm?release=6723)

<http://en.urbc.ru/daynews.asp?ida=205475>

The University of California, San Diego plans to store power produced at night from a planned 2.8 megawatt fuel cell and use the energy during peak-demand hours the following day when electricity rates are highest. Implementation of the advanced energy storage system at UC San Diego was made possible by the California Public Utility Commission's Nov. 21 approval of a measure designed to lower peak demands on the state's electrical power grid.

<http://ucsdnews.ucsd.edu/newsrel/science/12-08FuelCellProject.asp>

Ranga Pitchumani, professor of mechanical engineering at the University of Connecticut, has been named a John R. Jones III Fellow in the College of Engineering at Virginia Tech. The appointment was announced Nov. 24 by the Virginia Tech Board of Visitors. Pitchumani's research interests include thermal/fluid sciences, fuel cells and alternative energy conversion technologies, advanced materials processing, micro-and nanoscale processes, microfabrication, and transport phenomena. Pitchumani will be appointed as a tenured professor of mechanical engineering at Virginia Tech at the start of the 2009 spring term.

<http://www.vtnews.vt.edu/story.php?relyear=2008&itemno=738>

On Nov. 25, U.S. Patent No. 7,455,722 was issued to Rojana Pornprasertsuk of Palo Alto, Calif.; Friedrich B. Prinz of Woodside, Calif.; Jeremy Cheng of Longmeadow, Mass.; and Yuji Saito of Tokyo, for an ion irradiated electrolyte membrane. An abstract filed with the Patent and Trademark Office states: "Solid oxide fuel cells selectively transport oxygen ions through an electrolyte membrane. The maximum oxygen ion transport rate limits the power density of the fuel



<http://patft.uspto.gov/netaagi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2FSrchnum.htm&r=1&f=G&l=50&s1=7,455,722.PN.&OS=PN/7,455,722&RS=PN/7,455,722>

The *Straits Times* of Singapore reported in its Nov. 29 edition that scientists with the National University of Singapore won a \$2.3 million grant from the country's Environment and Water Industry Development Council to develop microbial fuel cells that have the potential to generate electricity cheaply while helping to clean wastewater. Assistant Professor Ng How Yong of the Division of Environmental Science and Engineering leads the research effort, which involves developing a technique for treating waste water without aeration.

[http://www.es.e.nus.edu.sg/CV\\_Ng\\_How\\_Yong.html](http://www.es.e.nus.edu.sg/CV_Ng_How_Yong.html)

The *Korea Times* reported in its Dec. 1 edition that an unmanned aerial vehicle (UAV) developed by researchers at KAIST (the Korea Advanced Institute of Science and Technology) is powered by a hydrogen fuel cell. The UAV, developed by a team led by Se-jin Kwon, could be used for military purposes and also surveillance and emergency rescue operations. Conventional unmanned aerial vehicles support a flight time of about one hour, but Kwon's machine was successfully tested at 10 hours on a single charge, according to the newspaper. A separate story about Kwon's research appears on the KAIST Web site:  
[http://www.kaist.ac.kr/english/01\\_about/06\\_news\\_01.php?req\\_P=bv&req\\_BIDX=10&req\\_BNM=e\\_d\\_news&req\\_VI=1748&req\\_PC=0&req\\_CG=&sCATE=&sCHAR](http://www.kaist.ac.kr/english/01_about/06_news_01.php?req_P=bv&req_BIDX=10&req_BNM=e_d_news&req_VI=1748&req_PC=0&req_CG=&sCATE=&sCHAR)

On Dec. 2, U.S. Patent No. 7,459,223 was issued to Joseph Gregory Zeikus of Okemos, Mich.; Hyoun S. Shin of Lansing, Mich.; and Mahendra K. Jain of Lexington, Kentucky, for their development of electrochemical methods for generation of biological proton motive force. The patent was assigned to the Board of Trustees of Michigan State University in East Lansing. An abstract filed with the Patent and Trademark Office states that the methods use “neutral red to mediate the interconversion of chemical and electrical energy. Electrically reduced neutral red has been found to promote cell growth and formation of reduced products by reversibly increasing the ratio of the reduced:oxidized forms of NAD(H) or NADP(H). Electrically reduced neutral red is able to serve as the sole source of reducing power for microbial cell growth. Neutral

<http://patft1.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2FSrchnum.htm&r=1&f=G&l=50&s1=7459223.PN.&OS=PN/7459223&RS=PN/7459223>

The Hocking College Energy Institute in Ohio was awarded \$48,500 by the Appalachian Regional Commission (ARC) under a grants competition to assist Appalachian communities in leveraging renewable-energy and energy-efficiency resources to revitalize their economies. Hocking College will use the funds to support courses and business assistance programs promoting wind and solar energy development, biofuels production, fuel cell development and "green" building design and certification to meet Leadership in Energy and Environmental Design (LEED) building and design certification, according to the commission. The energy institute was one of the winners of the second round of an ARC grants competition and the only Ohio winner. Grants totaling \$546,000 were awarded to nine projects across six Appalachian states, ARC announced Dec. 8. <http://www.hocking.edu/newsEvents/newsDetails.aspx?Channel=%2fChannels%2fContent+Channel&WorkflowItemID=64af569d-40c2-4f63-81ee-e0f2226b8a33>

Prabhakar Singh has been selected director of the Connecticut Global Fuel Cell Center at the University of Connecticut following an international search. His faculty appointment as the UTC Chair Professor of Fuel Cell Technology will be in the Department of Chemical, Materials and Biomolecular Engineering. Singh is currently with the Pacific Northwest National Laboratory where he oversees and directs the advanced SOFC development activities of the National Energy Technology Laboratory/PNNL-led DOE Solid State Energy Conversion Alliance Core Technology Program. He will begin his duties officially on January 1, 2009.  
<http://www.engr.uconn.edu/newcgfccdirector.php>

The University of Connecticut's School of Engineering announced that Hanchen Huang has accepted the school's Professorship in Sustainable Energy. Huang is currently a professor in the Department of Mechanical, Aerospace & Nuclear Engineering at Rensselaer Polytechnic Institute, Troy, NY. He will join UConn as a faculty member in the Department of Mechanical Engineering in August 2009. Huang's research involves surface/interface processing at the atomistic level that has tremendous potential to advance materials required for fuel cells, solar cells and catalyst development. <http://www.engr.uconn.edu/hanchenhuangnews.php>



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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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About *Fuel Cell Connection*
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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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