

What's New in the World of Superconductivity (July, 2009)

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Award

Oak Ridge National Laboratory (July 20, 2009)

Researchers at the U.S. Department of Energy (DOE)'s Oak Ridge National Laboratory (ORNL) have won eight R&D 100 Awards; these awards are presented annually by R&D Magazine in recognition of the most significant technological innovations to be made each year. One of these awards was presented to a team led by Dr. Amit Goyal for the invention of superconducting "wires" created using epitaxial growth on SSIFFS. These flexible, single-crystal, high-temperature wires are expected to enable high-performance advantages for electric power grid applications. Unlike conventional wires, the wires developed by the ORNL group are round; this morphology lowers heat loss and eliminates energy loss, making longer transmission lengths feasible. The wires can be bundled into larger dimension wires of any shape, allowing them to be used in specific devices or designs. The project was funded by the DOE's Office of Electricity Delivery and Energy Reliability.

Source:

"ORNL researchers win 8 R&D awards"

Oak Ridge National Laboratory press release (July 20, 2009)

http://www.ornl.gov/info/press_releases/get_press_release.cfm?ReleaseNumber=mr20090720-00

Power

Zenergy Power plc (July 20, 2009)

Zenergy Power plc has received a commercial order for a low-energy/high-productivity induction heater from Sapa Profili Srl (Sapa), the Italian subsidiary of the world's largest aluminum profiles producer, the Sapa Group. The induction heater will replace conventional gas heating equipment presently installed at an aluminum plant in Northern Italy. Replacement of the conventional equipment with Zenergy's superconducting technology is expected to improve the plant's operational efficiency, thereby enhancing the overall commercial potential. In particular, Sapa plans to use the versatility of the induction heater to heat several different types of aluminum alloy at the same plant, a task that was unachievable using the conventional equipment. Jens Müller, CEO of Zenergy Power, commented, "Previous sales of our high performance equipment have clearly proven the economic attractiveness of our highly efficient technology in high throughput operating conditions. In equal measure, this latest sale clearly demonstrates the

commercial advantages that can be gained from superconductor technology in circumstances of increased global competition and weakened demand.”

Source:

“Induction Heater Sale to World’s Largest Aluminum Extruder”

Zenergy Power plc press release (July 20, 2009)

http://www.zenergypower.com/images/press_releases/2009/2009-07-20-IH-Sale.pdf

Zenergy Power plc (July 22, 2009)

Zenergy Power plc has announced the successful testing of a new design for its fault current limiter (FCL), the fabrication and testing of which is part of an ongoing project funded by the U.S. Department of Energy (U.S. \$11 million) for the development of a ‘high-voltage’ version of Zenergy’s patented FCL device. This second design is known as the ‘compact’ design and is expected to form the basis of Zenergy’s high-voltage FCL. Zenergy is now engaged in discussions with potential utility partners for the next stage of the DOE project, which will involve the installation of the first ever high-voltage FCL in a U.S. electricity grid. Together with Zenergy’s existing medium-voltage FCL, the high-voltage FCL is expected to form the basis of a grid stability solution that will specifically address high-power stability issues in both medium-voltage and high-voltage sections of the power grid.

Source:

“Successful Testing of FCL Design – U.S. Department of Energy Project Update”

Zenergy Power plc press release (July 22, 2009)

http://www.zenergypower.com/images/press_releases/2009/2009-07-22-Successful-Testing-of-FCL-Design.pdf

American Superconductor Corporation (July 29, 2009)

American Superconductor Corporation (AMSC) has amended a multi-year contract with Sinovel Wind Corporation Limited, reducing the original 36-month delivery schedule to only 28 months, so that Sinovel will be able to meet the increased demand for its 1.5-MW wind turbines in China. The contract now calls for all shipments to be completed by the end of April 2011. In addition, a fraction of the PowerModule PM1000 power converters specified in the original contract will be upgraded to PowerModule PM3000W power converters, which have been optimized for wind turbine applications. Consequently, the overall value of the contract has been increased by approximately US\$20 million, bringing the total worth to more than US\$470 million. Greg Yurek, founder and chief executive officer of AMSC, commented, "This acceleration of shipments to Sinovel was necessitated by recent wind turbine orders received by them for new large-scale wind farms in China. We anticipate that Sinovel will continue to grow rapidly throughout the next decade, which we expect will give rise to new orders for our core electrical components for 2011 and beyond."

Source:

“AMSC Accelerates Shipments of Wind Turbine Components Under Amended Sinovel Supply Contract”

American Superconductor Corporation press release (July 29, 2009)

http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=1313821&highlight

American Superconductor Corporation (July 30, 2009)

American Superconductor Corporation (AMSC) has announced its financial results for the first quarter of fiscal year 2009, which ended June 30, 2009. Revenues for the first quarter increased by 83 % to \$73.0 million, compared with \$39.8 million for the same period in the previous fiscal year. The gross margin for the first quarter was 30.9 %, compared with 29.2 % for the same period in the previous fiscal year. A GAAP net income of \$1.8 million was achieved, compared with a net loss of \$6.1 million for the same period in the previous fiscal year. The non-GAAP net income for the first quarter was \$5.5 million, compared with a non-GAAP net loss of \$1.0 million for the same period in the previous fiscal year. As of June 30, 2009, the company had cash, cash equivalents, marketable securities, and restricted cash totaling \$103.2 million and a backlog of approximately \$497 million. Greg Yurek, AMSC's founder and chief executive officer, commented, "A solid mix of wind power and power grid business fueled another record quarter at American Superconductor. We achieved a strong increase in power grid-related D-VAR® system revenue and our largest customer, Sinovel, requested delivery of additional wind turbine core electrical components... to meet increased demand in China for its 1.5 megawatt wind turbines." AMSC has increased its revenue forecast for the full fiscal year to between \$260 million and \$270 million, with a gross margin of between 32 – 34 %.

Source:

"AMSC Reports First Quarter Fiscal 2009 Financial Results"

American Superconductor Corporation press release (July 30, 2009)

http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=1314131&highlight

Bruker Energy & Supercon Technologies (July 30, 2009)

Bruker Energy & Supercon Technologies (BEST; formerly Bruker Advanced Supercon), a division of Bruker Corporation, has entered into a sponsored research agreement with the University of Houston (UH); the collaborative research will focus on the testing and characterization of second-generation HTS tapes. BEST will provide UH with optimized coated conductors, while UH will test and characterize the tapes and then report their findings and recommendations back to BEST. The financial terms of the agreement were not disclosed.

Source:

"Bruker Energy & Supercon Technologies Enters Into R&D Collaboration Agreement with the University of Houston"

Bruker Energy & Supercon Technologies press release (July 30, 2009)

<http://www.advancedsupercon.com/pr090730.html>

Magnet

HTS-110 (July 22, 2009)

HTS-110 has announced the installation of a cryogen-free, HTS AC scanning magnet in the experimental ion-implanter beam-line at Nissin Ion Equipment Co. Ltd., in Japan. The magnet design required several innovations, including the minimization of AC loss in the HTS conductor, the reduction of eddy-current heating in the cryogenically cold components, the construction of a

robust non-metallic vacuum enclosure, and the creation of a novel power supply. The use of HTS magnets enabled the construction of a smaller and lighter device, which in turn allowed Nissin Ion to potentially shorten their beam line and to reduce their energy and water costs. Donald Pooke, CEO of HTS-110, commented, "Products like the AC scanning magnet are examples of the boundaries that are constantly being pushed by HTS-110, with the assistance of a network of local companies. With standard offerings now up to 16 tesla, HTS-110 have advanced products for customers available immediately. New products in development combine HTS technology and New Zealand innovation to create entirely new markets for the New Zealand HTS manufacturing industry".

Source:

"HTS-110 cryogen-free superconducting AC magnet installed at Nissin Ion, Japan"

HTS-110 press release (July 22, 2009)

<http://www.hts110.co.nz/wp-content/uploads/2009/07/hts-110-nissin-ion-ac-magnet-media-release-220709.pdf>

NMR and EPR

Bruker BioSpin (July 1, 2009)

Bruker BioSpin has received its first order for an ELEXSYS™ E780 system, the world's first commercial millimeter-wave 263-GHz electron paramagnetic resonance (EPR) spectrometer. The E780 contains a superconducting magnet that can be ramped up to 12 T; combined with new EPR probe technology for optimum sensitivity, the device can be used to measure samples as large as 5 mm. The system will be installed at the Helmholtz-Zentrum in Berlin in late 2009, where it will be used for pioneering new EPR applications in solar energy and photovoltaic research. The total order, valued at more than \$2.2 million, was supported by a recent German stimulus package and represents the start of a new research collaboration between Bruker and the Helmholtz-Zentrum.

Source:

"Bruker Announces Order for World's First Commercial 263 GHz EPR Spectrometer from the Helmholtz-Zentrum in Berlin for Solar Energy and Photovoltaic Research Applications"

Bruker BioSpin press release (July 1, 2009)

<http://www.bruker-biospin.com/e780>

Metamaterial

Universitat Autònoma de Barcelona (July 7, 2009)

Researchers in the Department of Physics at the Universitat Autònoma de Barcelona (UAB) have designed a device, called a DC metamaterial, that can make objects invisible in the presence of very low frequency electromagnetic waves. The device operates by making the inside of the magnetic field surrounding the object zero without altering the exterior field. In this manner, the device acts as an invisibility cloak, making the object completely undetectable to these waves. The device is based on the theoretical work of Ben Wood and John Pendry (U.K.).

The metamaterial device developed by the UAB researchers consists of an irregular network of superconductors, enabling the specific magnetic properties used to create “invisible” areas in the magnetic field and in very low frequency electromagnetic fields. The next step will be to build a laboratory prototype and to apply the device in magnetic field detection applications.

Source:

“Discovery at UAB brings us nearer to making the dream of invisibility true”

Universitat Autònoma de Barcelona press release (July 7, 2009)

<http://www.uab.es/servlet/ContentServer?c=Page&pagename=UAB%2FPPage%2FTemplatePlanaDivsNoticiesdetall&cid=1096476786473¬iciaid=1247033268934>

Accelerator

RI Research Instruments GmbH (July 9, 2009)

RI Research Instruments, a majority-owned subsidiary of Bruker Advanced Supercon, Inc., has been awarded an approximately US \$6 million contract from the U.S. Department of Energy (DOE)’s Thomas Jefferson National Accelerator Facility for the production of 86 superconducting accelerating cavities. The contract is for all 86 superconducting cavities required for the 12-GeV upgrade of the Continuous Electron Beam Accelerator Facility (CEBAF). The niobium superconducting cavities are the core components of the accelerating modules, which will be assembled at Jefferson Lab. Delivery of the cavities is scheduled to occur in 2010 and 2011. RI Research Instruments has previously provided both normal conducting and superconducting acceleration cavities to several other accelerators in the United States and Europe.

Source:

“RI Research Instruments GmbH Awarded Contract for Production of 86 Superconducting Accelerator Cavities for ARRA-Funded 23 GeV Upgrade of the DOE Thomas Jefferson National Accelerator Facility”

RI Research Instruments GmbH press release (July 9, 2009)

<http://www.research-instruments.de/press-090709>

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