

## What's New in the World of Superconductivity (December, 2007)

### Power

#### Zenergy Power plc (December 5, 2007)

Zenergy Power plc has raised £10,000,115 through a placing of 3,571,484 new ordinary shares of 1 p each in the company at a price of 280 p with a number of new and existing institutional investors. The money will be used as additional working capital to expand Zenergy Group's commercial activities. Zenergy has achieved a significant level of maturation in all four of its core activities (HTS induction heaters, renewable energy, HTS fault current limiters, and second-generation HTS wire) and expects to use the additional working capital raised in this placing to generate significant shareholder value through its early entry into global markets estimated to be worth more than €14 billion annually. The placing is conditional on the Placing Shares being admitted to trading on the Alternative Investment Market (AIM) of the London Stock Exchange.

Source:

"Institutional Placing to raise £10 million"

Zenergy Power plc press release (December 5, 2007)

<http://www.trithor.com/pdf/press-en/2007-12-05-Institutional-Placing.pdf>

#### Zenergy Power plc (December 17, 2007)

Zenergy Power plc has successfully tested a medium-voltage fault current limiter (FCL), proving that the device is capable of instantaneously and automatically responding to multiple surges in electrical power while maintaining a continuous, uninterrupted and stable supply of electrical power to 'downstream' devices. During the test, the device was exposed to real-life grid operating conditions and subjected to repeated electrical energy surges, replicating the severe fault currents associated with blackouts in national power grids. The FCL performed in line with expectations and is now advancing to become the first FCL to be installed in a commercial power grid in the US. The successful testing of this device was conducted under the observation of a number of US utility companies and representatives of The National Electric Energy Testing, Research and Applications Center (NEETRAC) and is the first such achievement in the United States. Zenergy believes that the US market for HTS FCLs is the largest in the world, with an estimated value of several billion dollars annually. The global market for FCLs is estimated to be worth as much as US \$5 billion annually.

Source:

"Key FCL Technical Milestone"

Zenergy Power plc press release (December 17, 2007)

<http://www.trithor.com/pdf/press-en/2007-12-17-FCL-Milestone.pdf>

#### Zenergy Power plc (December 19, 2007)

Zenergy Power plc has successfully produced a 10-m length of second-generation HTS wire using its patented "all-chemical" mass production process. With the assistance of a grant

from the German Ministry of Economics and Technology, Zenergy is developing “all-chemical” production processes with the goal of producing highly economically viable superconductor materials for commercial exploitation. The achievement is particularly significant for Zenergy’s collaboration with Converteam SAS on the development of highly energy efficient HTS power generators for the global wind and small hydro markets. Using Zenergy’s HTS coils and components, these generators are expected to reduce the overall cost of producing offshore wind power by around 25%. Zenergy’s achievement is especially timely as the United Kingdom’s Secretary of State for Business, Enterprise and Regulatory Reform, John Hutton, recently stated that it was the UK Government’s intention to have adequate electricity generated by offshore wind farms to “power the equivalent of all of the UK’s homes”.

Source:

“Key 2G HTS Technical Milestone”

Zenergy Power plc press release (December 19, 2007)

<http://www.trithor.com/pdf/press-en/2007-12-19-2G-HTS-Milestone.pdf>

## NMR

### **Bruker BioSciences Corporation (December 3, 2007)**

Bruker BioSciences Corporation has entered into definitive agreements to acquire the companies within the privately held Bruker BioSpin group for \$388 million in cash and 57.5 million in Bruker BioSciences shares, valued at \$526 million as of November 28, 2007. The transaction is subject to Bruker BioSciences shareholder approval, customary regulatory approvals and financing and is expected to close in early 2008. The acquisition is expected to be highly accretive for Bruker BioSciences and to generate revenue-related synergies through cross-selling opportunities and integrated solutions development as well as modest cost and expense synergies through better sourcing efficiencies and shared administrative functions. Bill Linton, the Lead Director of Bruker BioSciences, commented: “While both Bruker BioSciences and Bruker BioSpin are well established and successful companies on their own, the combined company will considerably increase and diversify its market presence, technology base, product lines, global distribution and customer support capabilities.” Bruker BioSpin is a technology and market leader in NMR and pre-clinical MRI as well as related superconducting magnet technology. After the completion of the transaction, the newly formed Bruker Corporation intends to open up its Superconducting Wire Business to additional outside strategic and financial investors to accelerate the development and growth of its HTS wire business in areas outside of Bruker’s traditional markets.

Source:

“Bruker BioSciences Corporation Announces Agreement to Acquire the Bruker BioSpin Group for \$914 Million in Cash and Stock”

Bruker BioSciences Corporation press release (December 3, 2007)

<http://phx.corporate-ir.net/phoenix.zhtml?c=121496&p=irol-newsArticle&ID=1083166&highlight>

## Communication

## Superconductor Technologies Inc. (December 17, 2007)

Superconductor Technologies Inc. and Hunchun BaoLi Communications Co. Ltd. (BAOLI) announced that the official registration of their joint venture, named BaoLi Superconductor Technology Co. Ltd., (BST) has been completed. BAO LI will own 55% of BST, while STI will own the remaining 45%. The registered capital of BST is \$25.5 million, with STI providing technology licenses and manufacturing knowledge and BAO LI providing real estate, manufacturing equipment, and cash.

Source:

“Superconductor Technologies and Hunchun BaoLi Communications Announce the Official Registration of the Planned Joint Venture”

Superconductor Technologies Inc. press release (December 17, 2007)

<http://phx.corporate-ir.net/phoenix.zhtml?c=70847&p=irol-newsArticle&ID=1087681&highlight>

## Fusion

### European High Temperature Superconductors GmbH & Co. KG (December 14, 2007)

European High Temperature Superconductors (EHTS) has received an order for 1100 HTS current lead stacks from Forschungszentrum Karlsruhe (FZK) for use in the German/EURATOM fusion project Wendelstein W7-X. The current lead stacks will utilize a new Type II HTS tape introduced by EHTS in August 2007; the new tape features a reduced metal content, high  $I_c$  performance, and superior mechanical strength. The current lead stacks will operate in the 420-A range.

Source:

“EHTS receives order for HTS current lead stacks for German/EURATOM fusion research project W7-X”

European High Temperature Superconductors GmbH press release (December 14, 2007)

[http://www.brucker-ehs.com/fileadmin/Press\\_Release/2007/Pressemitteilung\\_EHTS\\_HTS\\_FZK\\_order\\_engl\\_v2.pdf](http://www.brucker-ehs.com/fileadmin/Press_Release/2007/Pressemitteilung_EHTS_HTS_FZK_order_engl_v2.pdf)

## Accelerator

### CERN (December 14, 2007)

CERN Director General, Robert Aymar, provided a year-end status report outlining the progress that has been made towards the institute's goal of starting physics research at the Large Hadron Collider (LHC) in the summer of 2008. Additionally, The CERN Council approved a budget for CERN in 2008 that will allow CERN's aging infrastructure to be strengthened and preparations for an intensity upgrade for the LHC in 2016 to begin. Part of the renovations will include the replacement of the Proton Synchrotron accelerator, which was first switched on in 1959.

The LHC will become CERN's new flagship research facility and will bring together 9000 researchers from around the world. The facility's expected operation lifetime is around 20 years.

During this time, a variety of experimental collaborations are expected to bring new and profound insights into the nature of the Universe. The LHC has now been fully installed in its 27-km tunnel and commissioning is well underway, with two of the eight sectors presently being cooled down to their operating temperature of 1.9 degrees above absolute zero; three more sectors are being prepared for cooling. The installation of the device's detectors is also in its final stages. At present, the device remains on schedule for start-up in early summer 2008.

Source:

"CERN Director General reports on LHC progress"

CERN press release (December 14, 2007)

<http://press.web.cern.ch/press/PressReleases/Releases2007/PR11.07E.html>

## Basic

### **Boston College (December 20, 2007) and University of Tennessee at Knoxville (December 21, 2007)**

Using scanning tunneling microscopy, a team of researchers from Boston College, the University of Tennessee and Oak Ridge National Laboratory, have determined that bosons (particles with an integer amount of spin) are present when the electrons in electron-doped PLCCO pair. The energies of the observed bosons are consistent with magnetism as a possible cause of the pairing or "glue" that binds electrons together during high-temperature superconductivity – a result that agrees with previous findings using neutron scattering to analyze PLCCO. The findings represent another step toward elucidating the mechanism of high-temperature superconductivity. The research was published in the December 13 issue of *Nature* (see <http://www.nature.com/nature/journal/v450/n7172/abs/nature06430.html>).

Source:

"Boston College physicists find new explanation for superconductivity's 'glue'"

Boston College press release (December 20, 2007)

<http://www.physics.bc.edu/Deptsite/img/madhaven.pdf>

"UT-ORNL researchers take step toward understanding superconductivity"

University of Tennessee at Knoxville press release (December 21, 2007)

<http://www.utk.edu/news/article.php?id=4375>

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