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超電導 Web21 Superconductivity

Superconductivity Web21

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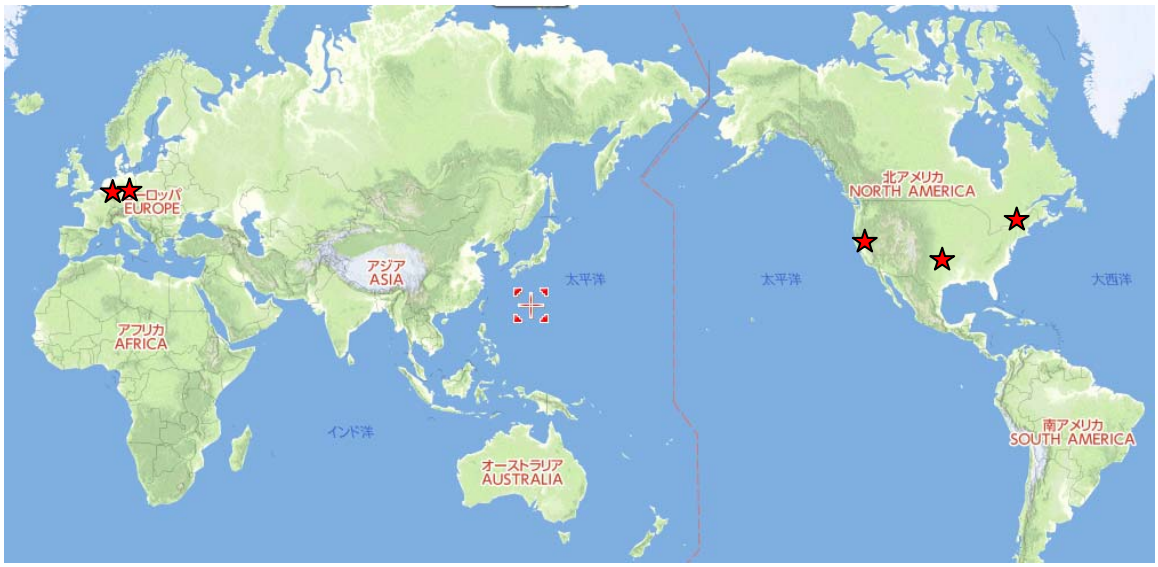
What's New in the World of Superconductivity (October, 2012)

Yutaka Yamada, Principal Research Fellow
Superconductivity Research Laboratory, ISTEC



★News sources and related areas in this issue

▸Wire 선 재료 线材料 [xiàn cáiliào]

Doubled Critical Current of Amperium® Wire

AMSC (October 8, 2012)

AMSC has introduced a new class of Amperium® superconductor wire for power cable applications. The breakthrough is expected to enable lower-cost superconductor power cables and to expand the potential global market for these systems. The new wire consists of a brass-laminated, 4.4-mm Amperium wire with

This work was subsidized by JKA using promotion funds from KEIRIN RACE.

http://ringring-keirin.jp

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a demonstrated current carrying performance as high as 200 A, which is considered to be an industry-leading performance for high-volume second-generation HTS wires. In addition to this substantial increase in performance, the kiloamp-meter pricing of the new wire is substantially lower that existing Amperium product lines. AMSC President and Chief Executive Officer Daniel P. McGahn commented, "This is an advance of tremendous importance for AMSC, its customers and the industry in general. By improving our wire performance, significantly reducing volume pricing and maintaining our industry-leading production capacity, we are positioning our products to fulfill the promise of HTS."

Source: “AMSC Doubles Superconductor Wire Performance and Reduces Pricing”
AMSC press release (October 8, 2012)
http://www.amsc.com
http://files.shareholder.com/downloads/AMSC/2165855216x0x603911/165a3cb0-c161-43b4-8095-cae5061fa22e/AMSC_News_2012_10_8_Commercial.pdf
Contact: Jason Fredette, jason.fredette@amsc.com

Pilot Production RCE-CDR system Completed

Superconductor Technologies Inc. (October 11, 2012)

Superconductor Technologies Inc. has completed the acceptance process for its next-generation Reactive Coevaporation Cyclic Deposition and Reaction (RCE-CDR) system. Testing at the supplier’s location has been completed, and the equipment has been received for installation at the company’s Advanced Manufacturing Center of Excellence in Austin, Texas. Ada, Shelton, VP of Marketing and Product Line Management at Superconductor Technologies, commented, “This pilot production RCE-CDR system, capable of producing 100 meter lengths of HTS wire, will demonstrate to our customers the high yield, uniformity and repeatability of our proprietary process. At the same, we will also validate several critical machine design parameters that we plan to integrate into the kilometer length manufacturing system scheduled for 2013." The delivery of the equipment marks the second of three system installations scheduled for 2012; a third component—a Solution Deposition Planarization (SDP) machine is currently completing system integration testing. The company expects to have a complete 2G HTS production suite installed and operation by the end of 2012.

Source: “Superconductor Technologies Inc. Completes Acceptance of Reactive Coevaporation Cyclic Deposition and Reaction (RCE-CDR) Equipment for Its Conductus® 2G HTS Wire Production”
Superconductor Technologies Inc. press release (October 11, 2012)
http://phx.corporate-ir.net/staging/phoenix.zhtml?c=70847&p=irol-newsArticle&ID=1744057&highlight
Contact: Investor Relations, Cathy Mattison or Becky Herrick of LHA for Superconductor Technologies Inc., invest@suptech.com, ; HTS Wire, Mike Beaumont of STI, mbeaumont@suptech.com

New Iron-Selenide Superconductor $Li_xFe_2Se_2(NH_3)_y$

Reported by Springer (October 29, 2012)

Researchers at the University of Augsburg, Germany, have synthesized a new iron-selenide class of

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superconductor known as $Li_xFe_2Se_2(NH_3)_y$ that exhibits a promising superconducting transition temperature of 44 K at ambient pressure, an improvement compared with traditional copper-base high-temperature superconductors. To fabricate the material, the authors used a chemical synthesis method to intercalate lithium atoms between layers of iron and selenium. Unlike previous attempts, the new materials could be successfully synthesized with a remarkable degree of purity. Furthermore, the superconductive fraction accounted for almost 80% of the material, which is the highest fraction reported to date for materials in the intercalated iron chalcogenides family. Additionally, the authors were able to further increase the superconducting temperature to 45.5 K by using sodium instead of lithium. The group's work has been published in the *European Physical Journal B*.

Source: "Cocktail achieves superconducting boost"
Springer press release (October 29, 2010)
http://www.eurekalert.org/pub_releases/2012-10/s-cas102912.php
http://www.epj.org/index.php?option=com_content&view=article&id=601%3Aepjb-highlight-cocktail&catid=110%3Aepj-b&Itemid=429&lang=en
Contact:Ann Koebler, ann.koebler@springer.com

▶Accelerator 가속기 加速器 [jiāsùqì]

Table-top Accelerators

Lawrence Berkeley National Laboratory (October 22, 2012)

Researchers at the Lawrence Berkeley National Laboratory have reached new benchmarks in electron beam quality as part of their research on laser plasma acceleration. Laser plasma accelerators (LPAs), or "table-top accelerators", promise a new type of accelerator that is far less expensive and has a much smaller impact on land requirements and the environment, compared with conventional accelerators. In the future, LPAs are expected to enable not only compact high-energy colliders for fundamental physics, but also diminutive light sources. Such devices would have a variety of applications, including the study of new low-temperature superconductors.
In the present report, the researchers used X-ray spectroscopy to measure the beam quality, succeeding in measuring the electron beams at a radius of 0.1 micrometers—smaller than any previously reported resolutions. The group's work has been reported in *Physical Review Letters*.

Source: "State-of-the-art beams from table-top accelerators"
Lawrence Berkeley National Laboratory press release (October 22, 2012)
http://www.eurekalert.org/pub_releases/2012-10/dbnl-sbf102212.php
http://newscenter.lbl.gov/feature-stories/2012/10/22/lpa-beams-part-1/
Contact: Paul Preuss, paul_preuss@lbl.gov

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Contract for Accelerating RF Cavities

RI Research Instruments GmbH (October 9, 2012)

RI Research Instruments, a majority-owned subsidiary of Bruker Energy & Supercon Technologies, Inc., has received a contract for five radio frequency cavities from the Facility for Antiproton and Ion Research (FAIR) project; the contract is valued at approximately $5.8 million and incudes the design and construction of radio frequency cavities with tunable frequencies from 1.1 MHz to 1.5 MHz. The cavities will be delivered over a 4-year period and will be installed in the facility's collector ring.

The FAIR project is being constructed at the GSI Helmholtz Center for Heavy Ion Research in Germany. The facility will provide antiproton and ion beams with unprecedented intensity and quality.

Source: "RI Research Instruments GmbH Awarded $5.8 Million Contract for Accelerating Cavities for FAIR Project in Germany"
RI Research Instruments GmbH. press release (October 9, 2012)
http://www.research-instruments.de/frontend/press/id/40
Contact: Hanspeter Vogel of RI, Hanspeter.Vogel@research-instruments.de

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