

What's New in the World of Superconductivity (April)

Power

American Superconductor Corporations (April 5, 2004)

American Superconductor Corporation (AMSC) has announced the acquisition of a 20% equity position in HTS-110, a new business from Industrial Research Limited (IRL), in New Zealand. HTS-110 will design and manufacture HTS electromagnetic coils, magnets, and other HTS devices for end users and original equipment manufacturers using AMSC's HTS wire. The non-cash transaction consists of the transferal of AMSC's CryoSaver® current leads business to HTS-110, giving the company non-exclusive licenses to certain coil patents as well as design and fabrication know-how. Explained Geoff Todd, chief executive of HTS-110, "More companies worldwide are seeking ways to use HTS technology to improve their products. Working together with these companies, we can reduce their development costs and bring new HTS products to the market in significantly less time." Current applications for the new company's products and services include electromagnets for scientific instruments and very high-speed generators. In the future, the company hopes to extend their business to incorporate accelerator magnet systems and magnetic separation magnets.

Source:

"American Superconductor Takes Equity Stake in New Company to Address Market for High Temperature Superconductor Components"

American Superconductor Corporations press release (April 5, 2004)

<http://www.amsuper.com/html/newsEvents/news/10335061601760.html>

Materials

Superconductive Components, Inc. (April 6, 2004)

Superconductive Components, Inc. has reported their financial results for the fourth quarter ending December 31, 2003. Total revenue declined to \$374,114 from \$595,239 for the same period in the previous fiscal year. A negative gross margin of \$166,022 was reported, compared to \$65,003 for the same period in the previous fiscal year. A 37.1% reduction in net sales was the largest factor affecting the fourth quarter 2003 gross margin, compared to the fourth quarter for 2002. General and administrative expenses were reduced from the same period in the previous fiscal year because of reductions in administrative staff, although some of these savings were partially offset by the company's relocation. Dan Rooney, Chairman, President and Chief Executive Officer, commented, "Bookings are beginning to improve following a very challenging sales environment throughout 2003. New customers have been identified in the photonics market as a result of our increased sales emphasis and initial orders have been received from several of them."

Revenue for the fiscal year ending December 31, 2003, amounted to \$2,268,488, a reduction of 23.3% from the previous fiscal year. Product sales totaled \$2,021,653, a reduction of 25.2% from the previous fiscal year. The decrease in sales was mainly due to the weak

marketplace. Total contract revenues for 2003 amounted to \$246,835, compared to \$254,462 in 2002. The gross margin was \$302,656, or 13.3% of the total revenue for 2003, compared to \$617,815, or 20.9% of the total revenue in 2002.

Source:

“Superconductive Components, Inc. Reports Fourth Quarter Results”

Superconductive Components, Inc. press release (April 6, 2004)

<http://www.sciengineeredmaterials.com/ne/earnings/scci43.htm>

NMR

Oxford Instruments and Varian, Inc. (April 19 and 20, 2004)

Oxford Instruments and Varian, Inc. have announced the launch of a new range of 400 – 600 MHz ActivelyCooled™ NMR magnets jointly developed and tested by the two companies. The ActivelyCooled™ magnets employ helium recondensing technology to address the conventional dependency of NMR magnets on the maintenance of liquid cryogen levels. Recondensing technology is expected to generate a wider user base, enabling NMR magnets to be used in locations where cost-effective access to the necessary cryogen or the on-site logistics required to support cryogen handling and re-filling are unavailable. System “downtime” associated with cryogen re-filling is also reduced, and the system is significantly more compact, since a separate nitrogen vessel is not required. The ActivelyCooled™ technology developed by Oxford Instruments includes a pulse tube refrigerator (PTR) that has been optimized to meet the cooling requirements of NMR; the absence of moving parts in the cold section minimizes vibration, which is essential for NMR applications. The system’s design has been further optimized to enable efficient servicing, with minimum downtime and service intervals of up to 24 months. The new product line is expected to become available for customer shipments in 10 – 12 months.

Source:

“ActivelyCooled™: a new cryogen-free technology for NMR”

Oxford Instruments press release (April 19, 2004)

<http://www.oxford-instruments.com/SCNNWP723.htm>

“ACTIVELYCOOLED™: A NEW CRYOGEN-FREE TECHNOLOGY FOR NMR”

Varian, Inc. press release (April 20, 2004)

http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=VARI&script=410&layout=-6&item_id=516506

Communication

HYPRES, Inc. (April 1, 2004)

Hypres, Inc. has been awarded two Phase II Small Business Innovative Research (SBIR) contracts from the U.S. Army Communications-Electronics Research, Development, and Engineering Center (CERDEC) for the development of an analog-to-digital converter (ADC) and a direct digital synthesizer (DDS). The two contracts have total potential value of more than US

\$1.5 million. Both components are targeted for use in next-generation electronic systems like software defined radios, which are being developed by the Department of Defense's JTRS program. Commented John Nunziato, Director of Wireless Technology & JTRS at the CERDEC Space & Terrestrial Communications Directorate, "HYPRES' technology is exciting because it allows us to effectively and affordably address some of the substantial size, weight, and power consumption obstacles in radios designed for the JTRS Cluster I program." For the receiver side, multiple broadband ADC front-ends will be designed to maximize the dynamic range over a 2 – 2000 MHz receive band. In conjunction with digital channelizers and cross-correlators, also being developed with concurrent funding, the ADC modulators will form the core of HYPRES' wideband multi-channel receiver architecture. The DDS component will synthesize spectrally pure waveforms with a center frequency of up to 2 GHz, modulating that signal at frequencies in excess of 200 MHz. The development of an L-Band ADC and DDS are critical to the realization of true all-digital RF transceivers for communications, defense and commercial applications. HYPRES is currently developing an All Digital-RF™ Receiver under an SBIR Phase III program with the Office of Naval Research.

Source:

"HYPRES, Inc. Awarded Two Contracts From The U.S. Army To Develop Joint Tactical Radio System Technology"

HYPRES, Inc. press release (April 1, 2004)

http://www.hypr.com/pages/new/bnew_files/PR_CECOM_SBIR_%20040104.htm

ISCO International, Inc. (April 29, 2004)

ISCO International Inc. (ISCO) has announced their first quarter financial results for the period ending March 31, 2004. Consolidated net revenues totaled \$422,000, compared to \$1,235,000 for a comparable period in the previous fiscal year. The gross margin for these two periods dropped from 49% in the previous fiscal year to 27% in the present fiscal year because of a lower fixed cost absorption during the recent quarter. Despite this reduction, the consolidated net loss for the quarter decreased to \$1,958,000, compared to \$3,151,000 for the same period in the previous year. This decrease was mainly due to a reduction in legal expenses associated with a patent litigation that is now being appealed. Dr. Amr Abdelmonem, CEO of ISCO, commented, "The one positive financial aspect of the first quarter was the continued improvement on the bottom line. Despite not realizing most of our expected revenue during the quarter, the efficiencies we have developed and the decrease in legal spending continue to show in our results, which were far better than the same quarter of 2003 despite lower revenue."

Source:

"ISCO INTERNATIONAL REPORTS FINANCIAL RESULTS FOR THE FIRST QUARTER 2004; ADDS MICHAEL FENGER TO ITS BOARD OF DIRECTORS"

ISCO International, Inc. press release (April 29, 2004)

<http://www.iscointl.com/>

Superconductor Technologies Inc. (April 29, 2004)

Superconductor Technologies Inc. (STI) has announced their first quarter financial results for the quarter ending April 3, 2004. Total net revenues amounted to US \$ 5.4 million,

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compared to the \$7.6 million for the same period in the previous fiscal year. Net commercial product revenues totaled \$3.2 million, compared to \$5.1 million for the same period in the previous fiscal year, while government and other contract revenue totaled \$2.2 million, compared to \$2.5 million for the same period in the previous fiscal year. Net loss for the first quarter amounted to \$5.9 million (including litigation expenses of \$227,000), compared to \$8.3 million (including litigation expenses of \$4.0 million) for the same quarter in the previous year. STI expanded their product profile during the first quarter to include AmpLink™ Rx, a ground-based sensitivity solution for present PCS wireless networks that can be upgraded with a SuperLink Rx front-end as interference increases because of rising demands. Record sales from this product are expected in the second half of 2004. Total net revenue of between \$6-7 million is expected for the second quarter.

Source:

“Superconductor Technologies Announces First Quarter 2004 Results”

Superconductor Technologies Inc. press release (April 29, 2004)

<http://ir.thomsonfn.com/InvestorRelations/PubNewsStory.aspx?partner=5951&storyId=112954>

Basic

Russian Academy of Sciences and Los Alamos National Laboratory (April 1, 2004)

Scientists working at the Russian Academy of Sciences and Los Alamos National Laboratory have announced the discovery of superconductivity in cubic diamond, creating the possibility of a new generation of diamond-based device applications and suggesting the possibility of superconductivity in silicon or germanium, which also has a diamond structure. The discovery was made in a boron-doped, diamond-structured carbon material that was synthesized at very high pressures and temperatures in Russia, at the Institute for High Pressure Physics (IHPP), Russian Academy of Sciences. The material was then brought to Los Alamos, where the discovery of its superconductivity characteristic was made. Boron atoms, with one less electron than carbon atoms, are easily incorporated into the diamond atomic structure. The resulting diamond becomes doped with electrical charge carriers, a small number of which allows the fabrication of transistors and a larger number of which allows superconductivity (at 5.37 K). The research was published in the April 1, 2004, issue of Nature.

Source:

“Superdiamonds? - Scientists discover superconductivity in diamond”

Los Alamos National Laboratory press release (April 1, 2004)

<http://www.lanl.gov/worldview/news/releases/archive/04-024.shtml>

(Akihiko Tsutai, Director, International Affairs Department, ISTECC)

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