

Georgia Tech Innovation Leads to Breakthrough Medical Device

Pressure sensing technology originally developed by Georgia Tech researchers for use inside jet engines is helping patients who have been treated for aortic aneurysms avoid a lifetime of invasive diagnostic tests. Developed by Atlanta-based CardioMEMS, the EndoSure™ sensor recently received U.S. Food and Drug Administration (FDA) clearance and is being marketed in the United States.

The implantable device measures blood pressure in persons who have been treated for abdominal aortic aneurysms, a weakening in the lower aorta that is the third leading cause of sudden death in the United States. Doctors can treat the aneurysm with a stent graft, a slender fabric tube placed inside the bulging artery to brace it and relieve pressure by creating a channel for blood flow. The graft can fail, however, so patients must be monitored regularly for early signs of leakage.

Until now, doctors have relied on CT scans for that monitoring. But the scans are invasive, time-consuming and expensive, while the radiation and contrast agents they require could have long-term effects on the body.

The EndoSure sensor is implanted along with the stent graft. During checkups, pressure readings can be taken by waving an electronic wand near the patient's abdomen. Radio frequency waves from the wand activate the sensor, which takes pressure measurements and relays the information wirelessly to an external receiver and monitor.

The sensor is believed to be the first wireless, un-powered permanently implantable pressure sensor for human use to be commercially available in the United States. Based on micro-electromechanical systems

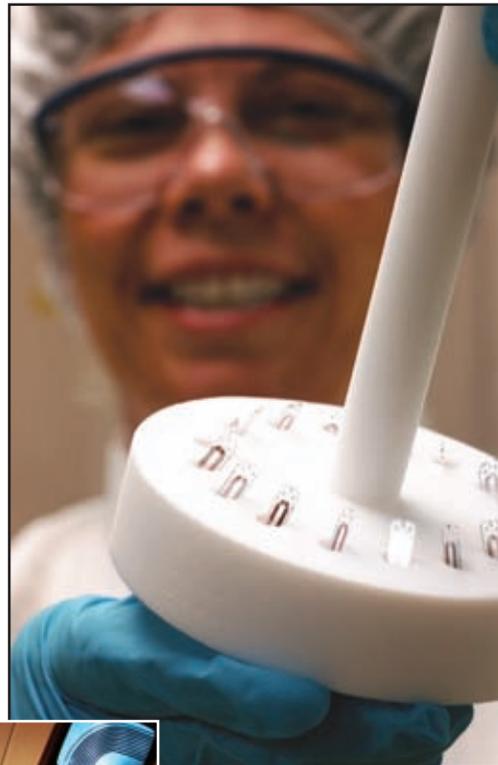
(MEMS) and wireless communications technologies, the complete system also includes a unique delivery catheter, the external interrogation device and proprietary software.

CardioMEMS was co-founded by Mark Allen, an internationally-known MEMS expert and a professor in the Georgia Tech School of Electrical and Computer Engineering. The company was incubated in Georgia Tech's Advanced Technology Development Center, and is currently headquartered in the Centergy Building in Technology Square.

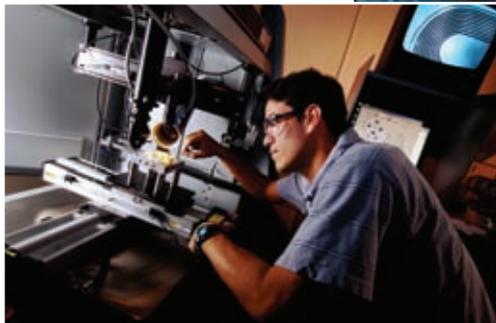
CardioMEMS is also developing other implantable sensing systems.

In addition to the recent FDA clearance, the company also raised a \$16

million round of funding. That brings to more than \$32 million the amount raised so far by the company, which graduated from the ATDC in spring 2005.



Photos: Gary Meek



(Top) Deborah McGee of CardioMEMS examines EndoSure sensors in the company's clean room facility at the ATDC Biosciences Center in Georgia Tech's Environmental Science and Technology Building. (Left) CardioMEMS engineer Michael Fonseca uses a laser to separate pressure sensors.

cardiomems
SENSING WHAT'S VITAL™

Preventing Storm Water Pollution

Although storm water runoff may not seem particularly threatening, it ranks among the most common sources of water pollution in the United States. Especially at industrial sites, rain and melting snow can pick up a variety of pollutants – ranging from processing chemicals to cleaning solvents – and sweep them into nearby creeks, lakes and rivers.

Federal regulation calls for companies engaged in certain industrial activities to obtain a storm water permit and implement a pollution prevention program. To make it easier for companies to comply with these regulations, Georgia Tech's Energy and Environmental Management Center has developed storm water pollution prevention plan software that streamlines the planning process – reducing a company's time and effort by as much as 80 percent.

Funded by the U.S. Environmental Protection Agency's Office of Water, this Web-based tool initially helps

companies determine whether or not they even need a storm water permit.

The program then walks companies through a series of questions about their facilities, such as whether they

have outdoor fueling stations or loading docks. The no-cost tool then guides companies through such tasks as assembling a pollution prevention team, identifying potential pollutants, selecting best management practices, and developing record-keeping and reporting procedures.



Photo: Gary Meek

Engineers from Georgia Tech's Energy and Environmental Management Center discuss an outdoor fueling station with Michael Jordan of Georgia Tech's Facilities Division.

www.gatechstormwater.com

Road Map for Nanomanufacturing

Researchers have taken an important step toward high-volume manufacturing of new nanometer-scale structures with the first systematic study of growth conditions that affect production of one-dimensional nanostructures from the optoelectronic material cadmium selenide.

Using the results from more than 150 different experiments in which temperature and pressure conditions were systematically varied, nanotechnology researchers at Georgia Tech created a "road map" to guide future nanomanufacturing using the popular vapor-liquid-solid (VLS) technique.

The results join earlier work that similarly mapped production conditions for nanostructures made from zinc oxide, an increasingly important nanotechnology material.



Photo: Gary Meek

Researcher Zhong Lin Wang poses with a tube furnace used to create nanometer-scale structures in Georgia Tech's School of Materials Science and Engineering.

Together, the two studies provide a foundation for large-scale, controlled synthesis of nanostructures that could play important roles in future sensors, displays and other nanoelectronic devices.

gtresearchnews.gatech.edu/newsrelease/nanomanufacturing.htm

The Value of Innovation

A study of nearly 650 Georgia manufacturers underscores the importance of innovation as a competitive strategy—at a time when international outsourcing continues to impact Georgia's manufacturing community.

The 2005 Georgia Manufacturing Survey shows that companies basing their competitive strategies on the development of innovative products or processes enjoy higher returns on sales, pay better wages and have less to fear from outsourcing than do manufacturers relying on other competitive strategies.

Georgia manufacturers that rely on innovation for their competitive edge reported returns on sales 50 percent higher than companies that compete by providing low cost products – a gap that grew substantially since the last survey in 2002. Innovative companies paid workers a third more than the average Georgia manufacturer and were 40 percent less likely to lose work to outsourcing than were companies competing on low cost.

On the down side, the survey found that 18 percent of Georgia companies had lost business due to international outsourcing from 2002 to 2004. Nearly half of the manufacturers reported concerns about human resources, up substantially since the last study.

The survey of Georgia manufacturers, part of a periodic study begun more than a decade ago, was conducted by the Office of Economic Development and Technology Ventures and the School of Public Policy at Georgia Tech.

gtresearchnews.gatech.edu/newsrelease/gms.htm

ATDC Joins Network for Homeland Security Firms

Georgia Tech's Advanced Technology Development Center (ATDC) has joined a unique national network of business and technology incubators that is focusing the power of entrepreneurship on the nation's most pressing security challenges.

The Technology Acceleration for National Security (TANS) network includes seven founding incubators from Alabama, Colorado, Georgia, Maryland, New York, Texas and Virginia. The network will help incubator companies make contact with the right audiences—and apply their technologies toward making the nation safer.

Selected for their superior services and capabilities, the TANS incubators represent 106 small businesses. Companies represented by the network provide solutions such as vulnerability scanning for networks, high-beam X-ray scanning for containers, nanotechnologies, multimedia search, wireless antenna technology, data mining to match terrorist names, massive data storage/transfer and a treatment for anthrax.



www.atdc.org/news_details.asp?NewsID=709

Internet Learning Anywhere

In U.S. cities and suburbs, high-speed wireless Internet connections are becoming more commonplace, making “anytime, anywhere learning” for students a more viable concept. But that kind of access and the opportunities it provides are not yet available in most rural areas.

However, a solution is in sight, and recent demonstrations at educational technology conferences in Montana whet the appetite of educators and



Photo: Jeff Evans

GTRI researcher Jay Sexton sets up wireless equipment atop a remote mountain near Missoula, Montana.

information technology specialists who want to level the playing field for students. Atop a remote mountain near Missoula, Mont., engineers from the Georgia Tech Research Institute (GTRI) awed conference attendees with the video streaming, Web access and e-mail capabilities of new wireless technology standards called WiMax.

The technology provides a potentially cost-effective way of providing Internet access in rural areas where installing conventional optical fiber would be too expensive.

gtresearchnews.gatech.edu/newsrelease/wi-max.htm

PROFILE

Charles Ross

Charles Ross brings member companies of the Advanced Technology Development Center (ATDC) more than a decade of experience with the venture capital and financial management aspects of early-stage technology companies.

Ross, who joined the ATDC in May, previously served as a principal at the Strategic Growth Advisory Group based in northern Virginia, and as vice president of the Telecommunications Development Fund – a Washington-based venture capital firm. In his new role as a venture catalyst with ATDC, he advises and assists member companies with a broad range of issues.

“I have a passion for working with entrepreneurs,” he says. “I really enjoy rolling up my sleeves and adding as much value as I can with early-stage companies.”

In his earlier positions, Ross worked with a dozen early-stage companies, most of them in telecommunications and information technology. While managing investments in eight companies, he held board seats and helped firms through the acquisition and IPO processes.

With an undergraduate degree in electrical engineering from Marquette University and an MBA from Indiana University, Ross is comfortable in both the technology world and the financial world. He is a charter holder of the CFA Institute, and a member of the Institute of Electrical and Electronics Engineers (IEEE).

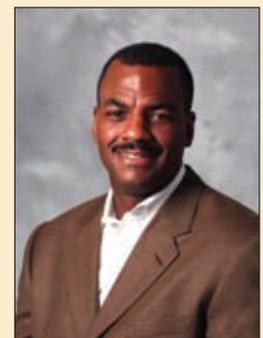


Photo: Nicole Cappello

Charles Ross

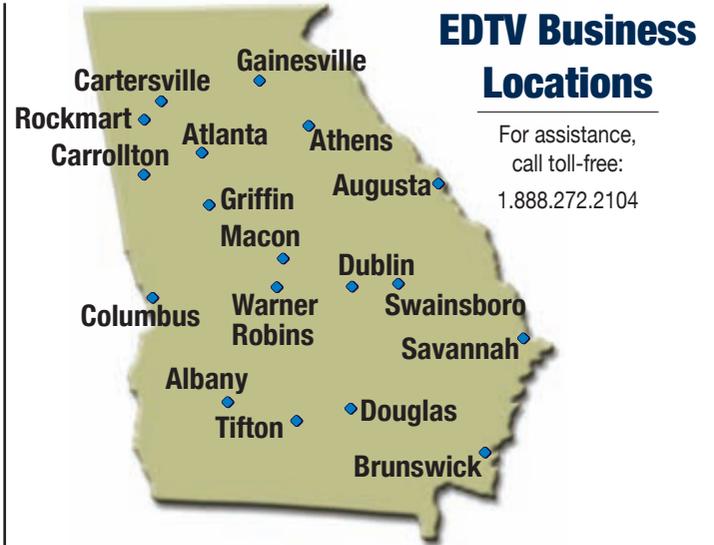
atdc.org/newsletter/2005-summer/atdcnews.asp

Around THE STATE

■ Through an assistance program supported by the U.S. Department of Energy, Georgia Tech helped a **Louisville** manufacturer of air-conditioning units implement changes expected to save hundreds of thousands of dollars over the next few years. Working with students and faculty from Georgia Tech's School of Mechanical Engineering, Tech's Energy and Environmental Management Center helped Thermo King identify potential savings in such areas as heating and air-conditioning – and reduced lighting. The project was done under the auspices of the Industrial Assessment Center located at Georgia Tech.

■ Beasley Forest Products, Inc., a hardwood sawmill in **Hazlehurst, Ga.**, produces lumber for flooring, cabinets, paneling, siding and other uses. When the company was considering installation of a natural gas boiler to heat its new kilns, Georgia Tech energy specialists suggested a wood-fired boiler fueled by the company's wood waste. Though more expensive initially, the wood-fired boiler will save the company money, and by allowing it to dry wood on site, will fuel revenue increases that could total as much as \$3 million per year.

■ **Virtual AeroSurface Technologies**, a company assisted by Georgia Tech's VentureLab program, has received a Small Business Technology Transfer contract worth \$750,000 from the U.S. Air Force. The contract brings total funding for VAST, which is commercializing flow-control technology developed at Georgia Tech, to nearly \$1 million. The technology could help improve control of aircraft, allow helicopters to fly faster and more efficiently, steer military projectiles in flight and reduce energy usage in heavy truck fleets.



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