Georgia Institute of Technology

IMPACT

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"Clean-Tech" Firms Gain Traction in Georgia Tech's VentureLab

Volatile weather, summer smog alerts, soaring fuel prices and growing environmental concerns have focused attention on the need for cleaner, more sustainable technologies.

That concern can be clearly seen among the startup companies formed in Georgia Tech's VentureLab program, which is assisting more than a half-dozen emerging companies that are pursuing clean-technology products and services. These new technologies range from renewable fuels and high-efficiency solar cells to hurricane forecasting and fuel cells tiny enough to operate on silicon chips.

Photo: Gary Meek

Photo: Gary Meek

Above: Photovoltaic cells cover the roof of Georgia Tech's Student Athletic Center as part of long-term research. Left: A solar cell developed at Georgia Tech.

Among the companies:

- C2 Biofuels, which seeks to produce ethanol fuel from biomass, including Southern yellow pine;
- WiSPI, which is developing tiny methanol fuel cells that can be integrated onto silicon chips;
- Climate Forecast Applications, whose tools may facilitate hurricane forecasting as much as 30 days ahead;
- Ajeetco, a solar energy company using high-efficiency polycrystalline silicon films to produce large-scale solar panels;
- LumoFlex, which is developing new organic photovoltaic materials; and
- Plum Combustion, which uses stagnation point reverse flow combustion to enable efficient burning.

Enterprise Innovation Institute Helps Companies, Communities and Economic Developers Meet Competitive Challenges

The Georgia Institute of Technology has launched a sweeping restructuring of its business and community assistance programs as part of a new organization known as the Enterprise Innovation Institute.

The organization brings together new and established Georgia Tech programs into a broadly-integrated effort aimed at helping companies, communities and economic developers meet competitive challenges through the application of science, technology and innovation. The new Enterprise Innovation Institute is believed to be the largest and most comprehensive university-based program of its type in the United States.

Creation of the new organization represents the first major reorganization of Georgia Tech's economic development and business assistance programs since the Economic Development Institute was formed in 1993.
The changes affect all activities of Georgia Tech's former Office of Economic Development and Technology Ventures, including the Advanced Technology Development Center (ATDC) incubator, VentureLab research commercialization effort, Commercialization Services initiative and former Economic Development Institute.

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Lean Manufacturing Helps MacGregor Golf Meet Customer Needs

When officials at one of the world's premier golf club manufacturers were looking for ways to improve their production process, they didn't realize that a new and better approach was already sitting in many PGA professionals' golf bags.

Albany-based MacGregor Golf Co., which employs about 115 workers during peak production, has been producing golf clubs for more than a century. Traditionally, the company had created new designs for each season and manufactured clubs to the new specifications in batches of 50. Customized clubs had accounted for about 10 percent of the company's annual output.

That process left MacGregor with a substantial inventory surplus at the end of each year. The company couldn't discount the leftover inventory without, in effect, competing with its own new designs for the following season. To seek solutions to the costly problem, company officials met with lean-enterprise experts at Georgia Tech's Enterprise Innovation Institute.

MacGregor and Georgia Tech began with a training program to introduce lean concepts to company employees. The effort led to implementation of manufacturing cells, a system in which everything needed to make a particular product is contained in a compact U-shaped area and workers are close enough to help each other when necessary. In turn, that led to a new production strategy in which products are produced in response to orders for them – essentially the same process MacGregor had used to produce custom clubs for PGA professionals.

Photo: John Stephens

A worker at MacGregor Golf finishes a club. The company boosted productivity, cut costs and reduced inventory through lean practices.

Adoption of the lean practices boosted productivity by 50 percent, cut labor costs by 25 percent and eliminated the problem of obsolete inventory. The company also realized energy savings by replacing an oven-based curing technique with an alternative process not requiring heat.

Industrial Assessment Center Trims Utility Bills

Manufacturers traditionally have been more concerned about such issues as reducing inventories and improving supply chains than counting kilowatts. But with utility bills a growing line item, companies are now trying to curb their appetite for energy.

Photo: Getty Images

Utility costs are becoming an increasingly important item for manufacturers. Georgia Tech's Industrial Assessment Center can help curb the appetite for energy.

Utility costs have become a particular problem for manufacturers that use a lot of natural gas and fuel oil. Some companies may be able to pass their rising costs on to customers, but many manufacturers operate on such slim margins that energy costs can be a threat to jobs and long-term viability.

Georgia Tech's Industrial Assessment Center helps small and mid-sized manufacturers with utility costs by sending teams of faculty and engineering students to facilities to look for ways of saving energy, reducing waste and becoming more productive.

The Center can help most companies reduce utility bills by 15 percent or more. If all of the recommendations made by the Center during 2005 had been implemented, Georgia manufacturers would have saved $2.85 million.

Companies Sign Collaborative Agreements with Georgia Tech

Companies with operations on three continents have recently signed agreements to collaborate with the Georgia Institute of Technology on electronics research, an "education through simulation" initiative – and the development of a new vehicle for law enforcement agencies.

In April, Carbon Motors Corp. and Georgia Tech took the first step toward a collaboration that would develop the world's first vehicle built expressly for law enforcement agencies. The company, which will market its "purpose-built" vehicle directly to customers, also plans to revolutionize U.S. automobile manufacturing as a lean and integrated organization. Carbon Motors has announced plans to locate its operations in Georgia.

Photo: Carbon Motors

Carbon Motors plans to develop the first "purpose-built" vehicle designed specifically for law enforcement agencies. The company plans to collaborate with Georgia Tech on key issues.

In June, GSE Systems signed an agreement to collaborate on research, development, education and training in advanced simulation systems. The collaboration will advance the company's goal of "education through simulation," a concept it believes will revolutionize education and training. Maryland-based GSE is a leading provider of real-time simulation and training services for the power, process, manufacturing and government sectors worldwide.

In July, European electronics firm Thales inked a cooperation agreement with Georgia Tech in applied electronics research to foster the transfer of knowledge and skills between the two partners. Thales and Georgia Tech will begin by introducing five doctoral programs on topics as varied as air traffic control and optimization of complex systems. Research projects involving joint research teams may follow.

For additional information about any item mentioned in this newsletter, please visit: innovate.gatech.edu/impact-q3-06

PROFILE

Keith McGreggor

Keith McGreggor calls himself a "serial entrepreneur." As an engineer and businessman, he's helped technological ideas grow into new applications or new companies for two decades.

Now, at Georgia Tech's Commercialization Services, McGreggor is following a similar path, As manager of technology evaluation, he's weighing the commercial potential of discoveries made by Georgia Tech researchers. "This is a great job," he said. "I'm able to see the cutting edge of the entire university, and it's pretty amazing."

McGreggor knows a few things about hatching new technologies. He led the Apple Computer group that developed the QuickTime multimedia player, and he developed one of the first color paint computer programs. He also co-founded NetRoadShow – the first Web-based "road show" for initial public stock offerings – which was subsequently acquired by Internet giant Yahoo.

McGreggor has also held managerial posts at Lockheed, Apple and Yahoo!, and has been involved in numerous startup companies.

"There have been several times when I've felt like I'd touched fire," McGreggor said. "I had the opportunity to get involved with some pretty far out things pretty early. And those are the things I'm on the prowl for now (at Georgia Tech)."

Photo: Rob Felt

Keith McGreggor

—*Enterprise Innovation Institute from cover*

Supporting Georgia Tech's goal of defining the technological university of the 21st century, the new Enterprise Innovation Institute will expand efforts to identify and transfer to industry key innovations likely to have significant impacts on local, state and national economies. Plans for the restructuring grew out of consultations with key Georgia Tech stakeholders, findings of the 2005 Georgia Manufacturing Survey, and recommendations from the National Innovation Initiative co-chaired by Georgia Tech President Wayne Clough.

"The rapid and dramatic changes taking place throughout the world mean U.S. companies can no longer compete just by reducing costs and boosting efficiency," said Georgia Tech Vice Provost Wayne Hodges, who leads the new organization. "To succeed in the future, companies must be able to develop and commercialize innovative products, processes and services ahead of their competition."

The new organization will also make Georgia Tech's services more customer-focused, more closely tied to the strengths of the parent organization, and better able to take advantage of Georgia Tech's expertise. It will also expand efforts to form new companies, create new commercialization opportunities and improve industrial competitiveness using innovations developed by Georgia Tech researchers.

The Enterprise Innovation Institute provides services through the following divisions:

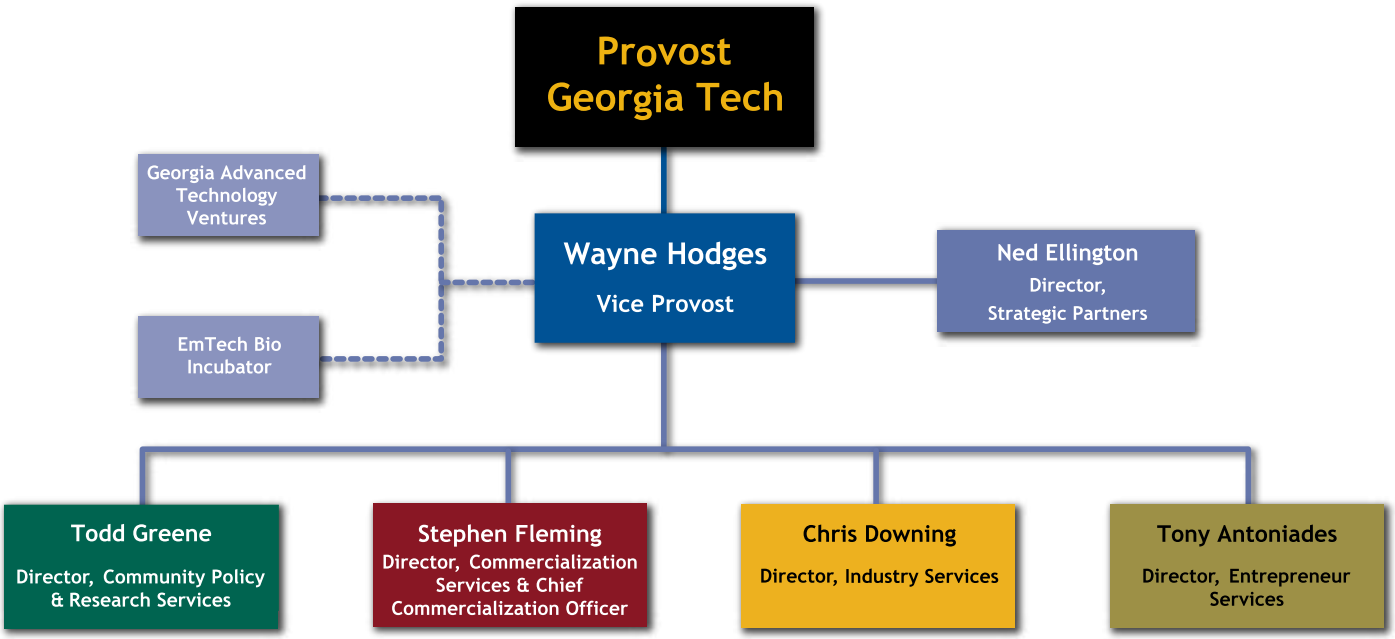
• **Industry Services**, which focuses on industrial customers around the state. Industry Services includes the Georgia Tech Regional Office Network, Atlanta-based centers that focus on such productivity improvements as quality, lean enterprise, energy and environmental management; and federally-supported programs such as the Manufacturing Extension Partnership and Georgia Tech Procurement Assistance Center.

• **Commercialization Services**, which moves technology out of Georgia Tech's research laboratories and into the marketplace. Commercialization Services identifies innovations with potential commercial value, works with faculty to determine the best path for commercialization, helps license technology to established companies, and – where appropriate – involves experienced entrepreneurs in forming new companies.

• **Entrepreneur Services**, which meets the needs of emerging companies around the state. Entrepreneur Services includes the Advanced Technology Development Center (ATDC) incubator, the Georgia Minority Business Enterprise Center (GMBEC), the Centers of Innovation program, and the SBIR Assistance Program for the State of Georgia—which helps eligible companies win federal research and development grants.

• **Community Policy and Research Services**, which brings innovation to local and state government entities while conducting technology-based research and policy projects that help communities provide a supportive economic environment.

• **Strategic Partners Office**, which assists companies seeking to develop Georgia Tech relationships, serving as a bridge to a broad range of campus-based resources and people.



Road Map for Nanoimprint Lithography Developed

Using a combination of experimental data and simulations, Georgia Tech researchers have identified key parameters that affect the outcome of nanoimprint lithography, a fabrication technique that offers an alternative to traditional lithography in patterning integrated circuits and other small-scale structures into polymers.

Nanoimprint lithography is the ultra-miniaturized version of the decades-old embossing process in which a master tool – or mold – is pressed into a soft material to create detailed patterns. Using a broad range of polymer materials, the process can produce structures on the micron or nanometer size scales, offering the potential for lowering production costs.

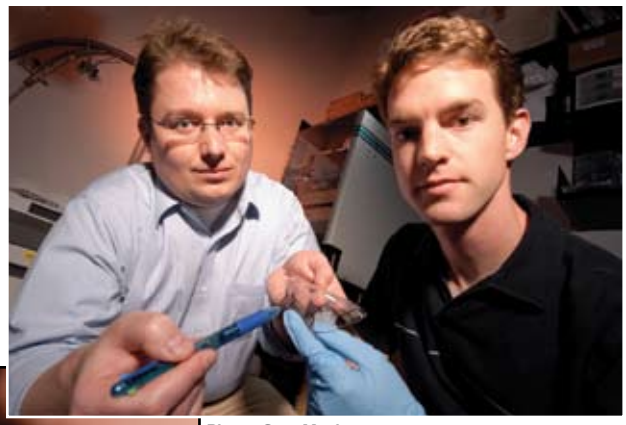


Photo: Gary Meek

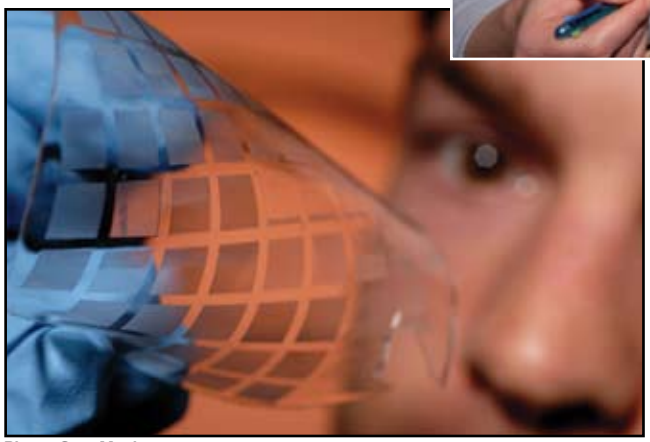


Photo: Gary Meek

Above: William King (left), assistant professor in the Georgia Tech School of Mechanical Engineering and graduate student Andrew Cannon show structures with micro-mechanical features. Left: Close-up of structures.

Results of a three-year study, conducted in collaboration with Sandia National Laboratories, provide a "road map" to guide development of this process. By reducing cost and time involved in trial-and-error searches for the right parameters, the design rules could help make high-volume production of nanotechnology-based products more economically feasible.

For additional information about any item mentioned in this newsletter, please visit: innovate.gatech.edu/impact-q3-06

Citizens and Community Leaders Identify Innovation Challenges

"How can communities harness the economic potential of technology and innovation?" That was the question posed to Georgians in a series of citizen forums held earlier this year. The answers were summarized in a report released June 4 at the annual meeting of the Southern Growth Policies Board in New Orleans.

"The Report on Georgia's 2006 Innovation Forums" examines innovation as a force to drive economic development in the state. New approaches, processes, products and ideas can help strengthen Georgia's ability to compete in the global economy, the report notes.

Nearly 400 Georgians participated in 18 forums held around the state as part of the effort, done on behalf of the Southern Growth Policies Board, a public policy think tank that focuses on economic development. The forums and report were led by the Georgia Institute of Technology and the University of Georgia in partnership with the Georgia Centers of Innovation and more than 20 local and regional partners.

AROUND THE STATE

■ A client of the Georgia Statewide Minority Business Enterprise Center scored big recently, winning the "Win a Million Dollars" competition sponsored by The Resource Institute, a non-profit corporation that assists small, woman and minority business enterprises. **RoadOne Express**, an East Point courier and freight company, was chosen from among several hundred Georgia entrants. The prize money, from Green Sky Financial, will be a combination of debt and equity funding.

■ By adopting lean enterprise techniques, Toccoa-based **Osborne Wood Products** boosted productivity by 25 percent and cut lead time for its wood turnings from six weeks to just three days. Specialists from the Enterprise Innovation Institute helped the 27-year-old company weed out inefficiencies by reorganizing its shop floor to accommodate the natural flow of production processes.

■ An Advanced Technology Development Center (ATDC) member company that has developed a chemical defect inspection solution for semiconductor manufacturers has closed on a $6 million round of funding led by Siemens Venture Capital. The company, **Qcept Technologies**, will use the money to further develop its Chemetriq automated wafer inspection system. Launched in the VentureLab program, the company is based on Georgia Tech technology.

■ A company based on technology developed at Georgia Tech and Emory University has received a $1.65 million Small Business Technology Transfer (STTR) Phase 2 grant to develop and commercialize a nano-scale sensor for detecting and diagnosing diseases, including cancer. **Vivonetics**, which got its start in the Georgia Tech VentureLab program, will receive the money from the National Cancer Institute to develop its molecular beacon technology.

Enterprise Innovation Institute Locations

For assistance, call toll-free: 1.888.272.2104

ATDC

Atlanta: 404.894.3575
Savannah: 912.963.2525
Warner Robins: 478.953.3155

VentureLab

Atlanta: 404.385.2360

For more information:

John Toon, Communications
(404.894.6986); E-mail: (jtoon@gatech.edu)

Assistance to Georgia businesses, communities and economic developers:
innovate.gatech.edu

Commercialization assistance to Georgia Tech faculty:
www.venturelab.gatech.edu

Applied research:
www.gtri.gatech.edu

Distance Learning & Professional Education:
www.dlpe.gatech.edu

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Wayne Hodges, Vice Provost

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Enterprise Innovation Institute
75 5th Street, N.W., Suite 100
Atlanta, Georgia 30308

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