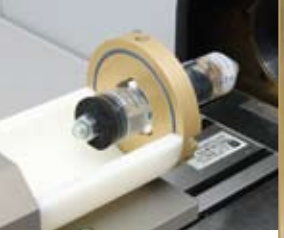
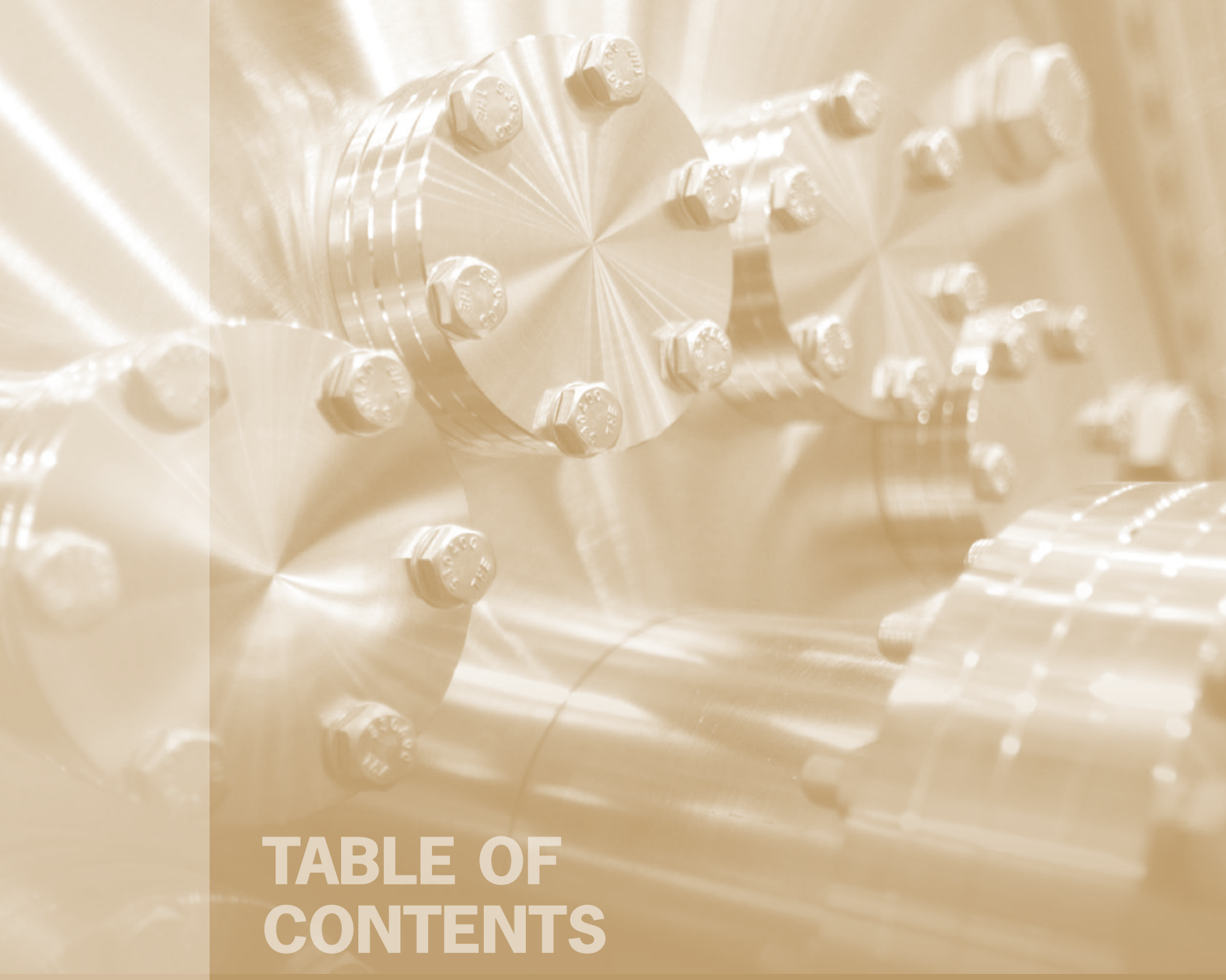


# A LEGACY OF STRATEGIC GROWTH

GEORGIA INSTITUTE OF TECHNOLOGY
ANNUAL REPORT 2008

Georgia Institute of Technology



# TABLE OF CONTENTS



▲ Main cover image and above image: Inside view of a vacuum chamber used in aerospace engineering research.

# A LEGACY OF STRATEGIC GROWTH

The 2007-08 academic year capped a fourteen-year period of exceptional growth and progress for Georgia Tech under the visionary and strategic leadership of G. Wayne Clough, the Institute's tenth president and the first alumnus to serve as president.

When Clough arrived on campus on September 1, 1994, he found a robust and well-regarded regional university with a reputation for engineering and applied research and an identity that was closely aligned with the South. The physical appearance of the campus was unimpressive, and despite being in the middle of Atlanta, the university was isolated psychologically and intellectually from the city.

What a difference fourteen years has made!

Georgia Tech now ranks among the nation's top public universities and is seen as a rising national power in emerging interdisciplinary fields such as biotechnology, nanotechnology, sustainability and energy, photonics and optics, telecommunications and microelectronics, manufacturing, and logistics. The research enterprise has more than doubled, and the Institute's growing global platforms are making it one of the world's few truly international universities.

Tech is now recognized as a national leader in diversity among students and faculty. The undergraduate experience has been energized in many ways, from electronic learning enhancements to expanded study abroad programs and opportunities to participate in dynamic research offerings.

The campus has been reshaped for beauty and sustainability, and its square footage has more than doubled. New and renovated academic structures not only feature the latest in technology, but are also designed for flexibility and interdisciplinary collaboration. Expanded housing allows 70 percent of undergraduates to live on campus, compared to 25-35 percent at the typical public university.

The vision of Georgia Tech's future that was shaped, articulated, and realized under Wayne Clough's leadership has inspired alumni, corporations, foundations, and other friends to provide generous support for a wide array of programs.

As Clough departed Georgia Tech in June to become secretary of The Smithsonian Institution, he left his alma mater with an incredible legacy of strategic growth. This carefully crafted growth has laid the foundation for even greater prominence in the future. The pages of this Annual Report not only highlight the Institute's major accomplishments of the most recent fiscal year, but also reflect on the unprecedented advances of the Clough years, which have led Tech to the prestigious position it now enjoys—and to the threshold of still greater heights.

# THE POWER OF PEOPLE

**Honoring the work of students, faculty, and staff** Georgia Tech's most valuable asset is—and always will be—its people. Tech's students, faculty, and staff are among the brightest and hardest working in the nation and the world. Because talented people are so central to the Institute's ongoing success, Tech invests in them and lauds their achievements.

## Fostering Student Success

A consistent focal point of Wayne Clough's presidency was making the undergraduate experience more engaging and exciting. Begun in earnest in the late 1990s, that effort included improving academic advising, increasing academic services, expanding opportunities for undergraduates to engage in meaningful research, and creating a wide range of study abroad opportunities for all majors. More than 40 percent of Tech undergraduates now engage in structured research, and more than a third study abroad.

Clough also oversaw the creation of an Honors Program and innovative interdisciplinary degree programs such as computational media and combinations of modern languages, international affairs, and global economics.

These initiatives have paid off handsomely. Student retention increased significantly, and after languishing at 68 percent for many years, the graduation rate has now reached 78 percent and is poised to go even higher.

Data from the National Survey of Student Engagement also confirm this transformation. The number of Tech seniors who think the Institute does well in academic advising leapt from about 51 percent in 2001 to nearly 70 percent in 2007. In the same time frame, the proportion of seniors who felt that Tech does a good job of providing academic support increased from less than 45 percent to nearly 60 percent.

As powerful as this reshaping of the undergraduate experience has been, its impact had been limited by declining access to a Tech degree due to the rapidly rising cost of education (a national trend). The growing problem genuinely struck a chord with Clough, and he responded by proposing a bold new scholarship initiative dubbed the Georgia Tech Promise. Quickly embraced by Tech alumni and other private donors, this new program guarantees a debt-free undergraduate education for all academically qualified residents of Georgia from low-income families.

"While a Tech education continues to be a great value, the Institute's ability to meet the financial needs of its lowest income students and families has eroded," said Clough. "The Tech Promise initiative is designed to fill this gap, helping us ensure that no qualified Georgia student will be forced to decline an offer of admission to Tech because of finances."

"Tech Promise is the primary reason I am still in school," says Emily Weigel, a double major in Biology/International Affairs and Modern Languages who was among the first group of Georgia Tech Promise scholars in the fall of 2007. "Despite getting scholarships and having a job, I still had several thousand dollars of unmet need. Now, being able to finish college and go on to graduate school is looking like a great possibility."

Last spring, the program was renamed the G. Wayne Clough Georgia Tech Promise in recognition of the vital role the former president played in making the scholarship a reality. Because state funds cannot be used for this purpose, the Institute is presently raising an endowment to support the program.

Complementing academic scholarships such as Georgia Tech Promise are a host

▲ Richard "Reeve" Ingle, a co-op student at NASA, worked on a variety of projects, including the design of a dashboard display unit, developing an RF spectrum map for the SCOUT Project (NASA's "moon-buggy" robot rover), developing electrical systems drawings for the International Space Station Japanese Experiment Module, and investigating methods of cleaning clothing in space.

◀ Academic advisor Nicole Leonard (left) talks with Honors Program student Diana Kerckhof.

# PEOPLE

Mary Vaughn, a Science, Technology, and Culture major, says the Georgia Tech Promise scholarship has allowed her to spend more time on her studies and less time working. “Tech Promise has allowed me to work only one job, focus on my education, and begin saving money for graduate school,” she says.

of athletic scholarships. Last spring, the family of the late William E. "Bill" Moore, for whom the Student Success Center and the Tennis Center are named, established the Moore Family Scholarship Fund for Women's Tennis in honor of the 2007 NCAA national titled earned by Tech's women's team.

"This endowment established by the Moore family is a long-term investment in our team that will allow us to attract women students who are highly skilled and competitive tennis players and top-notch scholars," says Bryan Shelton, head coach of women's tennis. "This is a gift that will have a major impact in perpetuity."

**Faculty Excel in Diversity of Disciplines**

Another theme of the Clough administration was increasing the size and quality of the Tech faculty. The number of full-time instructional faculty grew from 630 in 1994 to 863 in 2007, and the number of National Science Foundation CAREER Award recipients among Tech's young faculty jumped from 7 in 1995 to 122 by mid-2008, second highest in the nation.

Even as engineering faculty continue to exhibit the excellence inherent in a top-ranked program, professors in a range of other disciplines are increasingly attracting attention. For example, Ian Bogost, associate professor in the School of Literature, Communication, and Culture, published *Persuasive Games* last year to much critical acclaim. Bogost uses video games to simulate and explore complex societal systems, and his book advances a theory of how video games shape arguments and influence players.

"Games represent how real and imagined systems work, and they invite players to interact with those systems and form judgments about them," says Bogost. "Drawing on the history of rhetoric, the study of persuasive expression, I analyze [in *Persuasive Games*] rhetoric's unique function in software in general and video games in particular."

The College of Management demonstrated its growing excellence not only in strongly rising rankings, but also in the attention its research attracts. Science Watch recently recognized Georgia Tech for having the largest percentage increase in citations of its scholarly work in management and economics.

Although he works in the more traditional discipline of Industrial and Systems Engineering, Associate Professor Steven

Hackman broke new ground with *Production Economics: Integrating the Microeconomic and Engineering Perspectives*, which integrates two historically distinct perspectives.

"A production economist focuses on assessment, while a production engineer focuses on optimizing resources," says Hackman. "Each group could benefit from the other group's perspective. The book offers a unified, integrated point of view that bridges the gap between these two historically distinct perspectives."

Other notable faculty achievements in 2007-08 include:

- David Bader (Computing) published *Petascale Computing: Algorithms and Applications*, the world's first published collection of petascale techniques for computational science and engineering. Petascale computers can perform one quadrillion operations per second, nearly ten times the speed of today's fastest supercomputers.
- Jean-Luc Bredas (Chemistry and Biochemistry) ranks as one of the world's 100 most cited chemists and is the third most cited on organic thin-film transistors.
- Bill Koros (Chemical and Biomolecular Engineering) won the 2008 Alan S. Michaels Award for Innovation in Membrane Science and Technology.
- Aaron Levine (Public Policy) published *Cloning: A Beginner's Guide*, which explains the science behind cloning and embryonic stem cell research and explores related ethical and policy controversies.
- Donald Fedor and David Herold (Management) published *Change the Way You Lead Change* based on ten years of research on unsuccessful corporate change efforts.

# Celebrating Student Achievement

Georgia Tech students are known for their intellectual prowess and accomplishments, and that tradition continued in 2008.

Prashant Jain, a graduate student in Chemistry and Biochemistry, became one of six students worldwide to receive the Graduate Student Gold Award of the Materials Research Society. Richard "Reeve" Ingle was named Student of the Year by the Cooperative Education Division of the American Society of Engineering Education. A senior Electrical Engineering major with a 4.0 GPA, Ingle completed four co-op work terms with the NASA Johnson Space Center and an internship with the U.S. Department of Defense.

Tech students also garnered the nation's most prestigious academic scholarships:

- Nicole Larsen, a double major in Mathematics and Physics, received a $10,000 scholarship from the Astronaut Scholarship Foundation in recognition of her exceptional performance, initiative, and creativity in her majors. Larsen participated in the Cornell Laboratory of Elementary Particle Physics REU.
- Andrea Barrett, Inn Inn Chen, and Yixao Zou, all Biomedical Engineering majors, received Goldwater Scholarships, awarded to outstanding students in mathematics, science, and engineering who plan to pursue graduate school. Chen was also named a Marshall Scholar and member of *USA Today*'s all-USA College Academic Team.
- Thomas Earnest (International Affairs), Halley Espy (International Affairs), and Daniel Shorr (Psychology) received Fulbright Scholarships, which are designed to promote mutual understanding among people of the United States and other countries.
- Andrew Marin, a Chemical and Biomolecular Engineering major, received a Gates Cambridge Scholarship for graduate study, awarded for his intellectual abilities, leadership capacity, and desire to contribute to society.
- Thomas Christian, an Earth and Atmospheric Sciences major, received Georgia Tech's first-ever Morris Udall

Scholarship, awarded to outstanding students who are committed to careers related to the environment.
- Adam Tart, a Discrete Mathematics major, received one of twelve George Mitchell Scholarships, awarded annually to students for a year of graduate study at any university in Ireland.

# Emphasis on Staff Development Pays Off

A hallmark of Wayne Clough's presidency was his belief that the Institute deserved a staff as excellent as its students and faculty, and he promoted the creation of a wide range of staff training opportunities to support the Institute's workforce goals of developing:

- a culture that relies upon and is enriched by a diversity of people, their perspectives and experiences;
- a highly engaged, professional campus community with the knowledge, skills, and ability to exceed expectations; and
- an environment in which all employees understand the impact their contributions have on the achievement of the Institute's goals, and are proud to be members of the Tech community.

Staff quickly embraced these new opportunities, with participation in staff training programs increasing twenty-fold between 1994 and 2008. Last fall alone, 223 staff members completed professional certificate programs, and more than 2,000 completed online training modules.

"As a learning community, we believe that the professional development of Georgia Tech's employees is an investment in our future," says JulieAnne Williamson, acting executive director of the Office of Organizational Development, which administers professional development and training programs for staff. "Without Dr. Clough's unwavering belief in the power and the value of staff training and his active support of our efforts, I don't know that we could have made the tremendous strides that we have in recent years."

**McDowell Wins NCAA Singles Championship**
Georgia Tech All-American Amanda McDowell became the first Yellow Jacket to earn an individual national tennis championship at the NCAA Singles Championships last spring. She was the first Yellow Jacket ever to advance to the tournament semifinals and won her last four matches in straight sets. McDowell finished her remarkable sophomore season with a singles record of forty-five wins and eight losses, and has notched eighty-four singles wins in her first two years at Tech.

◀ Ian Bogost (left), associate professor in the School of Literature, Communication, and Culture, published the book *Persuasive Games* last year to much critical acclaim. The book advances a theory of how video games shape arguments and influence players.

# THE PROMISE OF RESEARCH

**Using new knowledge to improve lives** Georgia Tech has clearly emerged as a national and international leader in groundbreaking, interdisciplinary research that strives to improve the human condition. More than a decade ago, Tech's academic leadership realized that the future of research resided in the spaces between the traditional academic disciplines and has worked to create a genuinely interdisciplinary environment. One of the most dramatic examples was the formation in 1998 of the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University, the nation's first joint academic department between a public and a private university.

Today, that same innovative spirit enables the Institute to forge ahead into critical areas such as sustainability, energy, and medicine.

**Leading the Way in Sustainability Education, Research, and Policy**

From new buildings designed with the latest in sustainable features to ambitious plans for a campus Eco-Commons that will preserve green space and provide integrated storm water management, Georgia Tech's commitment to environmental sustainability permeates the operation of its campus.

It also infuses education and research. In fact, Tech's College of Management was recently ranked among the world's top 100 business schools by the Aspen Institute Center for Business Education for incorporating sustainability and social issues into its curriculum and research.

Former President Wayne Clough not only encouraged and supported sustainability initiatives at Tech, but also devoted time and energy to shaping sustainability policy. Last fall, he participated in a high-level working session on climate change policy in Washington, D.C., sponsored by the Center for the Study of the Presidency. The non-partisan session focused on effective policy options and best practices in defining domestic policy, accelerating research and innovation, and identifying an effective model for international cooperation.

Insights from the discussion have been shared with presidential candidates, congressional leaders, the White House, federal agencies, the research community, and thought leaders. The Center hopes to work with the transition team for the next president and encourage the new administration to make climate change a priority.

Augmenting Clough's work are the efforts of faculty members such as Public Policy Professor Marilyn Brown, a member of Working Group III of the Intergovernmental Panel on Climate Change (IPCC).

Working Group III has produced special reports on Aviation, Emission Scenarios, Technology Transfer, Ozone and Climate, $CO_2$ Capture and Storage, as well as the Third and Fourth Assessment Reports. As a result, IPCC is recognized as an authoritative voice on the climate system and its impacts, and received the 2007 Nobel Peace Prize together with former Vice President Al Gore.

The potential impacts of climate change may be much more extensive than previously thought. In fact, Peter Brecke, associate professor of International Affairs, is part of a research team whose findings show that long-term climate change may ultimately lead to wars and population decline.

Published last fall in the *Proceedings of the National Academy of Sciences*, the study revealed that as temperatures decreased centuries ago during a period called the Little Ice Age, the number of wars increased, famine occurred, and the population declined. Data on past climates may help accurately predict and design strategies for future large and persistent

▲ Public Policy Professor Marilyn Brown, author of the book *Energy and American Society: Thirteen Myths*, is part of a group that received the 2007 Nobel Peace Prize along with former Vice President Al Gore.

▶ Graduate student Jeffrey Drese displays a tubular reactor filled with the HAS adsorbent dispersed in sand. The reactor will be used to test the new material for its ability to capture carbon dioxide.

climate changes, but acknowledging the historic social impact of these severe events is an important step toward that goal, according to the study's authors.

"Even though temperatures are increasing now, the same resulting conflicts may occur since we still greatly depend on the land as our food source," says Brecke. "With more droughts and a rapidly growing population, it is going to get harder and harder to provide food for everyone, and thus we should not be surprised to see more instances of starvation and probably more cases of hungry people clashing over scarce food and water."

### Pioneering the Science of Carbon Capture

The rapid industrialization of nations such as China and India has led to rising levels of carbon dioxide in the atmosphere. Georgia Tech researchers are working to address this environmental challenge on several fronts.

The single largest source of U.S. carbon dioxide pollution is emissions from coal-fired electric power plants. However, present carbon capture technologies are expensive, and some require significant amounts of energy to operate. If required at power plants, they would dramatically increase the cost of electricity.

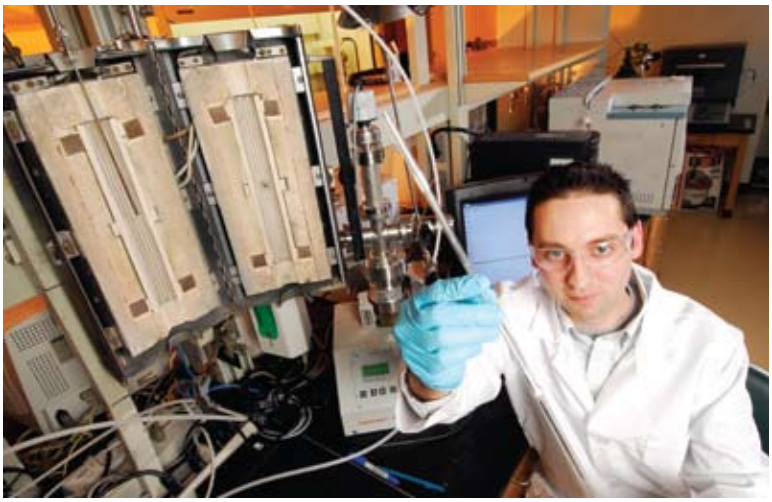
A research team in Tech's School of Chemical and Biomolecular Engineering has developed a low-cost, reusable material that could facilitate carbon dioxide capture from power plants and other industrial sources. Produced with a one-step chemical process, this new material has a high capacity for absorbing carbon dioxide and can be reused many times. Combined with improved heat management techniques, it could provide a cost-effective way to capture large quantities of carbon dioxide from coal-burning facilities.

"This is something that you could imagine scaling up for commercial use," says Professor Christopher Jones. "Our material has the combination of high capacity, easy synthesis, low cost, and a robust ability to be recycled—all the key criteria for an adsorbent that would be used on an industrial scale."

Other Tech researchers are working to make emission-free vehicles a reality. Their goal is to trap, store, and eventually recycle carbon rather than releasing it from the tailpipe into the atmosphere.

"Presently, we have an unsustainable carbon-based economy with several severe limitations, including a limited supply of fossil fuels, high cost, and carbon dioxide pollution," says Andrei Fedorov, associate professor of Mechanical Engineering and a lead researcher on the project. "We wanted to create a practical and sustainable energy strategy for automobiles that could solve each of those limitations, eventually using renewable energy sources and in an environmentally conscious way."

Currently, his research team is developing a fuel-processing device to separate the carbon from vehicle emissions and store it in the vehicle in liquid form. The captured carbon would be discharged at a fueling station, then shuttled to a processing plant where it could be transformed into liquid fuel and reused.



Associate Professor Matthew Realff

## Tech Professor Helps Develop New Standard for Sustainable Carpet

Don't call it "green" carpet; call it sustainable carpet.

A new standard for assessing the environmental friendliness of carpet was announced at the 2007 Greenbuild International Conference in Chicago. Approved by the American National Standards Institute, the standard addresses chemicals and materials used in manufacturing carpet, the energy used in production, the use of recycled or bio-based content, methods of disposal and/or reuse, and the overall environmental performance of manufacturers.

"The LEED (Leadership in Energy and Environmental Design) standards for buildings suggested that standards were an effective strategy for encouraging competition and providing an objective way of evaluating sustainability claims made in the marketplace," says Matthew Realff, associate professor of Chemical and Biomolecular Engineering, who chaired the committee that developed the standard.

"This new standard provides tremendous benefit to those decision makers who specify and purchase billions of yards of carpet annually in the United States," explains Werner Braun, president of the Carpet and Rug Institute, a nonprofit trade association based in Dalton, Georgia. "The new unified standard assures those purchasers that they are selecting environmentally preferable carpets."

A standard that enables consumers to choose the most sustainable products should encourage manufacturers and their suppliers to seek out or develop environmentally preferable processes, practices, power sources, and materials.

### Pushing the Boundaries of Alternative Energy

As fossil fuel costs soar, attention is increasingly turning to alternative energy sources, long a focal point for Georgia Tech.

At the Center for Innovative Fuel Cell and Battery Technologies in the Georgia Tech Research Institute, researchers are working to reduce cost and improve durability by solving the problems that cause fuel cells to fail. Center Director Tom Fuller identifies the top durability problems as chemical attack of the membrane, carbon corrosion, and platinum instability.

"My philosophy is if we can really understand the fundamentals of these failure mechanisms, then we can use that information to guide the development of new materials or we can develop system approaches to mitigate these failures," says Fuller, also a professor in the School of Chemical and Biomolecular Engineering.

Another key source of alternative energy is the sun, which totally powers a model home designed and built by an interdisciplinary team of students and faculty. The house was Tech's entry in the U.S. Department of Energy's 2007 Solar Decathlon, in which twenty universities from around the world competed to build the most energy-efficient solar house. The houses were assembled on the Mall in Washington, D.C., for the competition, in which the Tech team ultimately placed sixth.

Following the Decathlon, the College of Architecture appointed Green Habitats Foundation Inc., a non-profit organization that promotes sustainable building, as steward of the house. Green Habitats will study and demonstrate the effectiveness of the house's materials, solar panels, insulation, and heating and cooling systems.

"We are very grateful to have Green Habitats' assistance and vision for this long-term project," says Doug Allen, interim dean of the College of Architecture. "We have formed a true partnership in the pursuit of high-performance architecture and building."

### Improving Quality of Life through Medical Research

Applying engineering and scientific research results to advance healthcare diagnostics and treatment has been a hallmark of Tech's research enterprise for quite some time. This focus has led to the development of numerous technologies and instruments that have dramatically improved health outcomes. These breakthroughs have also allowed for the collection of enormous amounts of data on biological systems, leaving scientists to ponder how to interpret this newfound information and apply it to living systems.

In response to this opportunity, Georgia Tech has created the Integrative BioSystems Institute (IBSI) to explore new technologies and methods to collect and analyze these millions of pieces of biological information in order to form a more complete picture of how life works and how the environment affects living things.

"In biology, we can now measure the expression of 50,000 genes at a time," says Eberhard Voit, founding director of IBSI, David D. Flanagan Chair, and Georgia Research Alliance Eminent Scholar in Biomedical Engineering. "Needless to say, no one can analyze these massive amounts of data by hand. So, computer methods and mathematical models are needed to help us put all these pieces of information together in order to solve some of the grand challenges in biology.

"The ultimate goal, which we can only see in the distant future, is to develop simulations of entire cell systems capable of predicting how a body (or even a specific patient) will respond to a multitude of stimuli, medications, and environmental exposures and lead to chronic diseases like diabetes and cancer," Voit says.

IBSI will focus on three areas: understanding the development of normal cells into cancer cells, exploring the interaction between humans and microbes in the environment, and developing enabling techniques for analyzing biological systems.

### Putting Patients First

While IBSI is a critical internal collaboration, Georgia Tech is also forging new relationships with key external healthcare organizations. For example, Georgia Tech, Saint Joseph's Health System, and Saint Joseph's Translational Research Institute (SJTRI), a division of Saint Joseph's Health System, reached an innovative agreement designed to move new treatments, therapies, and products into clinical use with patients more rapidly. The agreements call for the $18.5 million relocation and expansion of the SJTRI research facilities to Technology Enterprise Park, a new bio-business park located adjacent to the Georgia Tech campus, and collaboration between physicians and researchers at Saint Joseph's Hospital and Georgia Tech faculty and students.

"The greatest roadblock to getting new therapies or devices from the research lab to patients has been the silo approach to research," says Nicolas Chronos, president

▲ Graduate Research Assistant Stacey Schutte works with a nitrogen cooler in a lab that focuses on bioengineering and fluid mechanics. Graduate students Peter Crapo and Christiane Gumera work in the Georgia Tech/Emory Center for the Engineering of Living Tissues, which is working to develop new tissue regeneration technologies to help address the organ transplantation crisis.

# RESEARCH

Brian Stone, associate professor in the College of Architecture, consulted with Atlanta's High Museum of Art on the retrofitting of their roofs with trays of plants that increase the energy efficiency and visual appeal for the higher surrounding buildings. Stone's research focuses on urban environmental phenomena with an emphasis on climate change and air quality.

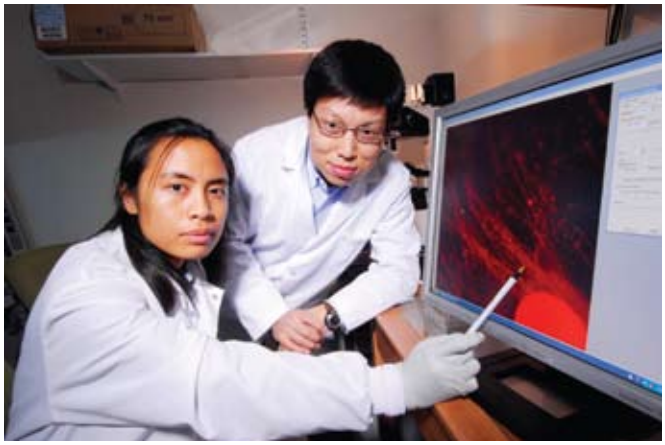
of SJTRI. "This relationship between Saint Joseph's and Georgia Tech brings all the forces together—clinicians, patient care, biotechnology, bioengineering, bioscience, and entrepreneurial business—for cross collaboration and innovation that will move the process ahead much faster for the benefit of patient care."

Phase one, an expanded 32,000-square-foot SJTRI facility in Technology Enterprise Park, includes catheterization labs, an expanded vascular physiology lab, surgical suites, and additional research capabilities. Georgia Tech researchers will have access to the research facility for clinical trial activities.

A number of research partnerships with Emory University are advancing healthcare detection and delivery as well, including a study on the use of microneedle patches for painless delivery of flu vaccinations that received $11.5 million from the National Institutes of Health.

"A vaccine administered through a skin patch would have a number of advantages, including less discomfort to the recipients, lower cost, and reduced production time," says Richard Compans, professor of microbiology and immunology in the Emory School of Medicine. "Potentially, individuals could administer the vaccine to themselves, perhaps after receiving it in the mail."

"We expect that this research will lead to a better way of delivering the flu vaccine, which will allow more people who need it to receive the immunization in a convenient and effective way," said Mark Prausnitz, professor of Chemical and Biomolecular Engineering at Tech. "Beyond that, the possibility of replacing a hypodermic needle with a microneedle patch should significantly impact the way that other vaccines are delivered."



Another Emory partnership has resulted in the development of a new device that may allow patients to take a brief, inexpensive test that could be administered as part of a routine yearly checkup at a doctor's office to detect mild cognitive impairment (MCI), often the earliest stage of Alzheimer's disease. The device was slated for commercialization in late 2008.

Research conducted in the joint Tech/Emory Biomedical Engineering Department has yielded a potentially promising strategy for encouraging the regeneration of damaged central nervous system cells known as neurons. The technique would use a biodegradable polymer containing a chemical group that mimics the neurotransmitter acetylcholine to spur the growth of neurites, which are projections that form the connections among neurons and between neurons and other cells. The biomimetic polymers would then guide the growth of the regenerating nerve.

In addition, researchers at the Georgia Tech Research Institute have developed a sensor system that continuously monitors the air around persons prone to asthma attacks. Worn in the pockets of a vest, the new system could help researchers understand the causes of asthma attacks.

▲ Yadong Wang, assistant professor in the Coulter Department of Biomedical Engineering at Georgia Tech and Emory University (right), and graduate student Christiane Gumera (left) have developed a new strategy for neuron regeneration.

▼ Researchers Mark Prausnitz (left) of Georgia Tech and Richard Compans of Emory University are leading efforts to develop a new way to deliver the flu vaccine using microneedles.

# THE VALUE OF GLOBAL PARTNERSHIPS

**Leading the way in international engagement** Collaborating with educational, research, and corporate partners around the world is a longstanding tradition at Georgia Tech. Tech's most fully developed global platform is Georgia Tech Lorraine in Metz, France. Begun in the early 1990s as a master's degree program, GT Lorraine now has a well-rounded graduate program in engineering, and the recent addition of student housing to the campus has paved the way for a year-round undergraduate program.

Led by a Georgia Tech faculty member, GT Lorraine participates in dual-degree programs with other universities in France as well as Germany, Italy, and Russia. GT Lorraine also has developed research partnerships with other European universities and industries, as well as the French National Center for Scientific Research, Europe's largest scientific research organization.

As the pace of globalization has accelerated over the past decade, Georgia Tech has expanded its international presence by extending its own education and research platforms beyond Metz, while also extensively broadening the range of study abroad and exchange programs available to students.

**Enhancing Academic Partnerships**

Last fall Georgia Tech's Stewart School of Industrial and Systems Engineering launched the Institute's first undergraduate dual-degree program with an international university, Monterrey Tech (ITESM) in Mexico. The program allows engineering students from ITESM to transfer to Georgia Tech during their third year. After completing the Industrial Engineering degree requirements at Tech, students return to ITESM to complete the degree requirements there. The result is an engineering degree from ITESM and an Industrial Engineering degree from Georgia Tech.

"I was fortunate to be in the first generation of this new dual-degree program between ITESM and Georgia Tech," says Alejandro Leyva, one of the first four students to come to Tech in 2007. "As soon as I heard I was a potential candidate for the program, I knew I wanted to participate. My decision was basically based on Tech's No. 1 ranking in Industrial Engineering."

On the other side of the Atlantic, Georgia Tech has partnered with two leading Italian universities to offer dual master's degrees in electrical and computer engineering and computer science. Begun in the fall of 2008, they are the first dual graduate programs in these disciplines between American and Italian universities.

For the master's degree in electrical and computer engineering, Tech's School of Electrical and Computer Engineering teamed with the School of Information Technologies at the Politecnico di Torino in Torino, Italy.

"Georgia Tech has long worked with key industry partners in Italy," says Gary May, school chair of Electrical and Computer Engineering. "This new affiliation will afford students the opportunity to experience competitive and complementary approaches to engineering solutions in a cross-cultural environment."

The master's degree in computer science emphasizes the development of computing and networking applications and is offered by Tech's School of Computer Science and the School of Informatics at the University of Trento in Trento, Italy.

"The College of Computing has had an ongoing relationship with the University of Trento and the Trentino region of Italy for the last three years," says Richard DeMillo, a Computing faculty member who served as the College's dean from 2002-2008. "We are providing these students the chance to experience firsthand the new opportunities that come with globalizing education."

Even further afield from Atlanta, plans continue to move forward for a Georgia Tech campus in India. The government of the Indian state of Andhra Pradesh has offered land for the campus near the state capital of Hyderabad, which is India's sixth largest metropolitan area with more than 6 million residents. The focus of the campus would be engineering and research, with courses taught by tenure-track faculty members from Tech.

▲ The first ITESM students to enroll in the dual degree program were (from left) Allam Garcia, Alejandro Leyva, Patricio Bichara, and Hector Morales.


Students in the dual degree Logistics and Supply Chain Management master's program joined students from the Global Logistics Scholarship program for a tour of Norfolk Southern's Whitaker Intermodal Terminal. The largest intermodal terminal east of the Mississippi River, it expedites the movement of containerized freight throughout the country.

# PARTNERSHIPS

### Expanding Role for Research and Corporate Partnerships

In addition to international academic partnerships, the Institute continues to form critical alliances with research agencies and corporations.

A prime example is Georgia Tech Ireland, established in 2006 by the Georgia Tech Research Institute and IDA Ireland, the economic development agency of the Irish government, to help with the commercialization of research from the nation's universities.

GT Ireland has attracted the attention of visionary private donors who see the value of investing in a new research model while learning from and helping shape one of the great economic success stories in the modern era: Ireland's transformation from a relatively poor country to a world technology leader in one generation.

"The Irish government has done an excellent job in promoting new technology and making it very attractive to establish development programs jointly with them," says Allen Ecker, executive vice president of Scientific-Atlanta, Tech alumnus, and donor to GT Ireland. "Many companies such as Cisco, Microsoft, and Intel are now partnering with the Irish government and have facilities in Ireland."

In a project that encompasses four continents, the Supply Chain & Logistics Institute (SCL) in the Stewart School of Industrial and Systems Engineering is studying and working to improve temperature-controlled supply chains that stretch around the world. Leading the effort are Professors John Bartholdi and Don Ratliff.

"Our first project is devoted to the international supply chains that move wine from the great producing regions to the United States," says Bartholdi.

In this endeavor, the SCL team collaborated with the Commonwealth Science and Industrial Research Organization of Melbourne, Australia; Pontificia Universidad Catolica de Chile of Santiago, Chile; and the Council of Science and Industrial Research of Cape Town and Pretoria, South Africa, to form the Wine Supply Chain Council.

According to Bartholdi, beyond temperature control, moving wine must account for issues related to the timing of picking and crushing the grapes, fermentation, and bottling the wine.

"By tracking hundreds of cartons from all over the world, we hope to piece together a picture of this supply chain that is unique in scale and detail," says Bartholdi. "We will work with the wineries, carriers, and distributors all along the supply chain to improve the care and efficiency with which the product is handled."

Bartholdi plans to use what is learned from the wine project to address similar problems in the movement of vaccines and other perishable medicines.

The GT Ireland campus in Athlone, Ireland, is receiving substantial private and government support for its mission of commercializing research from Irish universities.

## Steve McLaughlin participates in state's visit to China

International collaborations of all stripes are a vital concern to Steve McLaughlin, who became Tech's first vice provost for International Initiatives last fall. A few months into his new job, McLaughlin found himself aboard Delta Air Lines' first direct flight from Atlanta to Shanghai, China, with a Georgia delegation that included Gov. Sonny Perdue. The delegation's purpose was to establish an economic development office in Beijing for the state of Georgia.

"There were about forty people from Atlanta—university people, industry people, economic development people, local government officials—who went with the governor and spent several days making China more aware of what's going on in Georgia," says McLaughlin. "Part of the trip was focused on research and development, and how Georgia [can develop partnerships]."

Tech already works with both Peking University and Tsinghua University in China's capital city. The Institute is helping Peking University build its engineering program, and one of McLaughlin's goals for the trip was to continue the development of Tech's relationship with Tsinghua, which to date has been characterized largely by collaborations between individual professors.

McLaughlin says both the United States and China are involved in network building. "The best universities in China want to be connected to the best universities in the world," he says. "What those networks look like—what's accomplished in those networks—everybody's trying to figure out a model that works for them."

# THE IMPACT OF ECONOMIC DEVELOPMENT

**Strengthening the state, region, and nation** Georgia Tech opened its doors 120 years ago with a mission of helping to bring the state's agrarian economy into the industrial age. Today, the Institute works to transform that industrial economy into an innovation economy. In addition to educating the technological workforce of the twenty-first century and conducting research that drives innovation, Tech provides strategic support for both industry and government.

## Services to Industry

Georgia Tech's Advanced Technology Development Center (ATDC) is widely regarded as one of the nation's top incubators for fledgling high-tech businesses. Over the past two decades, its companies have generated revenues of more than $12.7 billion and profits of more than $100 million.

The value of the services ATDC provides is demonstrated by the fact that ATDC companies have raised more than $1 billion in venture capital since 1999. More than 110 companies have graduated from the incubator since ATDC was founded in 1980.

As of summer 2008, ATDC had more than forty companies in incubation—its largest number ever—many of them based on research from Georgia Tech labs. Their products and services ranged from biotechnology to clean energy, from healthcare to software and Internet applications.

In addition to nurturing high-tech start-ups, Georgia Tech reaches out to small and mid-sized companies around the state, helping them implement innovative operating strategies. The Georgia Manufacturing Survey, conducted by Georgia Tech's Enterprise Innovation Institute (EII) and School of Public Policy, indicates companies that compete based on innovation enjoy higher returns on sales, pay better wages, and have less to fear from outsourcing.

Universal Forest Products in Ashburn, Georgia, a manufacturer of wooden roof trusses used in construction, is a recent beneficiary of EII's expertise. Assembling a truss is a little like putting a puzzle together: many different parts must first be cut to the right size and shape, then placed into the proper location. Until recently, workers at the plant were cutting thousands of parts and storing them in a rack, from which the components needed for a particular truss could be gathered.

"We didn't have a problem building the trusses, but cutting all those components was challenging," says Lee Matthews, operations manager for the facility. "I was running high in overtime, and we even went as far as putting on a small second shift. We needed a better flow."

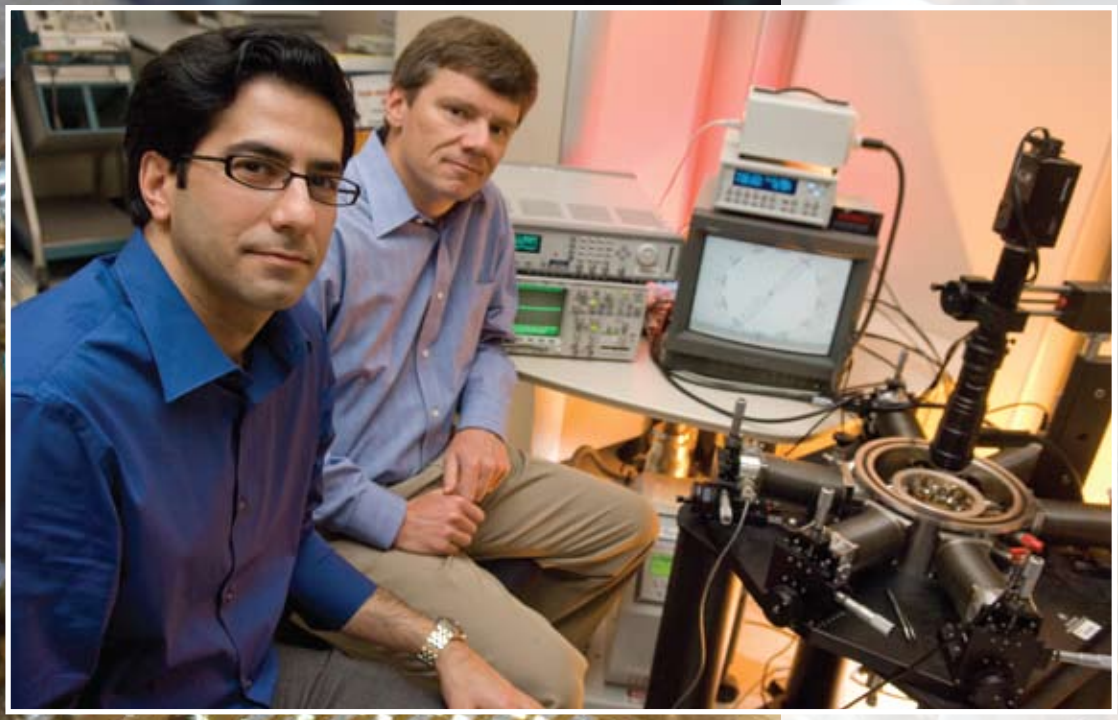
It was not uncommon to have as many as 16,000 pieces cut and stored, waiting for assembly. Now that number is zero, thanks to a continuous improvement initiative instituted by the company with help from Georgia Tech's EII.

Management and front-line supervisors completed EII's lean training, learning to eliminate the overproduction caused by traditional scheduling systems, manufacture products based on customer demand, and utilize value stream mapping to guide implementation efforts. By mid-2008, the company had already improved its on-time delivery rate to 84.1 percent from 77.1 percent in 2007.

EII also helped U.S. Energy Sciences improve its production of high-quality, energy-efficient products. When owners Cindi Hicks and Andy Loosberg moved the company to Georgia four and a half years ago, their process for manufacturing energy-efficient commercial lighting products was anything but efficient.

"When we moved to Vidalia, we were able to acquire a building, but the manufacturing process had never been designed," says Hicks. "Materials didn't flow from one end of the factory to the other, and we


Advanced Technology Development Center companies have raised more than $1 billion in venture capital since 1999.



With assistance from the Advanced Technology Development Center (ATDC) and Georgia Tech's VentureLab, Qualtré is commercializing the next generation of motion sensors, further broadening their applicability in consumer electronics devices such as cellular handsets, personal navigation devices, and gaming controllers. Qualtré is led by Founder and Chief Technology Officer Farrokh Ayazi (left) and President and CEO Michael Slawson. Ayazi is also an associate professor in Georgia Tech's School of Electrical and Computer Engineering.

# ECONOMIC DEVELOPMENT

had an overwhelming amount of inventory scattered everywhere."

So Hicks and Loosberg sought the counsel of Matt Oxley, an EII entrepreneur outreach specialist charged with helping rural Georgia companies become more innovative. Oxley helped the company completely reorganize its 70,000-square-foot plant, convert its assembly lines to lean manufacturing concepts, and implement software applications.

The results are impressive. Set-up times have been reduced by 80 percent, the company's ability to meet order deadlines has increased by nearly 60 percent, and productivity has doubled with the same number of employees.

### Services to Government

Recognizing that traffic congestion is one of the most serious problems facing the Atlanta region, the Governor's Congestion Mitigation Task Force recommended that congestion-reducing projects be given priority for transportation funds. But what is the best long-term strategy for congestion relief? Congestion pricing, also called value pricing or peak-period pricing, is gaining acceptance as a tool for reducing congestion and improving flow on freeways, but will it have the intended effect?

A Georgia Tech team, led by Professor Catherine Ross, director of the Center for Quality Growth and Regional Development (CQGRD) in the College of Architecture, and Professor Randall Guensler, director of the School of Civil and Environmental Engineering Transportation Group, is undertaking a research effort funded by the Georgia Department of Transportation (GDOT) to help answer these questions.

The study will include a review of newly introduced toll collection technologies and case study analyses of similar projects in other states and abroad. The team will also determine metro Atlanta preferences through a series of focus groups. The results will help guide GDOT and the State Road and Tollway Authority of Georgia in the siting, evaluation, and implementation of future pricing strategies.

The CQGRD also conducted a study to assess the infrastructure of Hall County in northeastern metro Atlanta, where rapid growth is being generated by proximity to Atlanta, the recreational opportunities afforded by Lake Lanier, and the availability of moderately priced housing.

Findings and recommendations of the study deal with the broad categories of green infrastructure, economic development, transportation, and livability. The goals are to improve quality of life, preserve the subregion's environment and cultural character, and strengthen the local economy for the short and long term.

Another ongoing Tech research project monitors vehicle emissions from 420,000 vehicles a year at more than 60 sites in the Atlanta, Macon, and Augusta areas. Data is being gathered for at least 100 days a year over a period of 15 years to determine whether the $80 million to $100 million Georgians pay for vehicle emission inspections and repairs each year is well spent.

"Georgians spend a major chunk of change on inspections and repairs, so you want to make sure the inspections program is working," says Michael Rodgers, a principal research scientist at the Georgia Tech Research Institute. "We've found that it is indeed reducing vehicle emissions in the region. The state is investing less than 1 percent of the cost of the program to monitor it. So that's a cost-effective solution."

▲ Professors Catherine Ross and Randall Guensler are leading a research team examining the potential of congestion pricing to reduce gridlock on metro Atlanta freeways.

▼ Georgia Tech's Center for Quality Growth and Regional Development is studying ways to reduce congestion and improve Atlanta's traffic flow.

# THE BONDS OF COMMUNITY

**Being a good neighbor**

Forging stronger ties with Georgia Tech's closest neighbors was a high priority for Wayne Clough, who believed that a healthier, more vibrant area surrounding campus would benefit both the Institute and the community.

This guiding principle has spawned numerous community-oriented initiatives, including a recent effort to promote water conservation in four neighborhoods contiguous to the Tech campus. Tech's Institute Partnerships office is connecting schools and neighborhood associations in the Centennial Place, English Avenue, Home Park, and Midtown areas with representatives from The Home Depot, who share expertise and direction on how residents can save water—a high priority in a time of historic drought.

Presentations on conserving water were made last spring to local neighborhood and tenant associations, parent-teacher association meetings, and in the classrooms of participating schools. Participants received complimentary Home Depot gift cards.

"Georgia Tech's mission is not only to set an example for environmental stewardship, but also to make sure that our neighbors have access to the resources they need to make conservation a way of life," says Institute Partnerships Director Andrea Ashmore.

"Protecting and preserving our water supply is critical to our environment, our economy, and our health," says J. T. Rieves, regional vice president for The Home Depot. "Simple tips and products, such as low-flow products for the home, can make a tremendous impact on the amount of water residents use. We are happy to help educate Atlantans on the importance of water conservation."

In addition, Georgia Tech's Center for Education Integrating Science, Mathematics, and Computing is now working with The Home Depot to adapt water conservation information into a curriculum for six partner schools for the 2008-09 school year. The eventual goal is to make these curriculum materials available to schools throughout Atlanta and the state.

The English Avenue neighborhood was also the focus of another project, a special topics course in the Georgia Tech Honors Program titled "Semester in the City: Engaging English Avenue."

The course's primary objectives were "to understand the community on its own terms, but also study it within the larger context of the city of Atlanta, and to find ways to work on some doable and sustainable service projects that will bring us into partnership with the people of the neighborhood," says Gregory Nobles, professor of History, Technology, and Society (HTS) and director of the Honors Program, who taught the course with Institute Partnerships' Andrea Ashmore.

The course promoted both intellectual inquiry and active engagement. In addition to working with neighborhood leaders, students were assigned reading (including books by two Tech authors, Ron Bayor of HTS and Larry Keating of City and Regional Planning) and written work (analytical essays and reflective journal entries).

Class projects included:

- a Web site for the English Avenue Neighborhood Association;
- a Saturday youth enrichment program for students from Kennedy Middle School and Bethune Elementary School; and
- a playground concept now being considered for construction by the English Avenue Development Corporation.

Atlanta Mayor Shirley Franklin and Fulton County Commission Chairman John Eaves spoke to the class about how decisions by local and state leaders contribute to the improvement of economically depressed areas. Eaves offered examples of how lawmakers in Fulton County use legislation and funding to impact directly and indirectly the lives of county residents in neighborhoods like English Avenue.

Ashmore is also coordinating an ongoing effort to encourage stakeholders in the Centennial Place neighborhood near campus to help improve the appearance of the area and to reduce crime. Intensive efforts began last fall to increase the size of the Centennial Place Stakeholders group and strengthen crime reduction through a more coordinated approach from the Atlanta Police and Georgia Tech Police departments as well as private security personnel of business and non-profit stakeholders. The change was especially dramatic in the categories of burglary and auto theft, where reported crimes fell by more than 60 percent in a seven-month period.


Community service is a high priority for Georgia Tech students such as Elise Mendenhall, an undergraduate Civil and Environmental Engineering major. Mendenhall is pictured painting a house as part of a local Habitat for Humanity project.


# COMMUNITY

Georgia Tech student Daniel Warren helps Jamal Young with some computer work at Fickett Elementary School during TEAM Buzz Community Service Day. Tech student Sumaiya Khan (below) tutors a Bethune Elementary student.


**Serving the Broader 'Community'**

While strengthening the local community is a critical goal for some students, others have a much broader concept of the term "community." Marco Gutierrez, a PhD student in Industrial and Systems Engineering, worked with CARE (Cooperative for Assistance and Relief Everywhere) to improve humanitarian relief logistics.

Early in his PhD program, Gutierrez heard that Industrial Engineering Professor John Vande Vate was interested in humanitarian relief logistics. Vande Vate connected Gutierrez with CARE USA's Atlanta-based Emergency Unit, which supports emergency responses in more than sixty-five countries.

Initially, Gutierrez worked with the senior logistics advisor for CARE's Emergency Unit to understand the supply chain processes of emergency response situations. Later, he supported a team from Vande Vate's class on transportation and supply chain systems, which conducted a project for CARE. The student team examined the feasibility of designing both an emergency shelter and its supporting supply chain that could be implemented within forty-eight hours after the onset of a disaster.

"In working with CARE, I have had the opportunity to see the influence that our work has had in starting to transform its supply chain practices," says Gutierrez. "It is very gratifying to realize that the potential impact of our work can translate into decreased human suffering around the world in addition to dollars saved."

While Gutierrez focuses on responding to disaster, another Tech project anticipates catastrophic flooding and warns thousands of vulnerable residents in Bangladesh, where flooding has worsened. The pilot forecasting system, designed by scientists at the National Center for Atmospheric Research (NCAR) and Georgia Tech, uses a combination of weather forecast models, satellite observations, river gauges, and new hydrologic modeling techniques.

The system is part of a larger initiative, known as Climate Forecast Applications in Bangladesh, to improve flood and precipitation warnings in the low-lying nation. Peter Webster, professor of Earth and Atmospheric Sciences, is the principal investigator of the overall initiative. The one- to ten-day forecasts are delivered directly, when possible, to more than 100,000 people living in floodplains of the Brahmaputra and Ganges rivers. They will be distributed more widely in coming years.

Webster and NCAR scientist Thomas Hopson have provided forecasts to Bangladeshi agencies since 2003, but the forecasts often have not reached rural regions, where many residents lack radios and even electricity. In 2007, the nonprofit Asia Disaster Preparedness Center established a network of organizations to distribute the forecasts directly to people in five districts along the two rivers.

▲ PhD student Marco Gutierrez has worked with CARE USA to support transportation and supply chain systems for emergency response situations.

▲ Professor Peter Webster is leading an effort to improve long-range precipitation forecasts in flood-prone Bangladesh.

## Governor honors faculty, staff for role in charitable campaign

Georgia Gov. Sonny Perdue honored Georgia Tech faculty and staff last spring for their role in the 2007-08 state charitable campaign. During an awards luncheon, the Institute received both the Governor's Award for the largest increase in contributions and the Governor's Cup for best performance among organizations with 1,001 to 9,000 employees.

"Compared to the prior year, our contributions increased 42 percent, or more than $88,000—$299,839 in 2007 and $211,089 in 2006. In addition, the number of donors nearly doubled from 766 to 1,528," says Student Center Director Rich Steele, coordinator of the Institute's campaign. "[We] averaged nearly $55 per employee, or $196 per donor." Career Services Director Ralph Mobley served as campaign co-coordinator.

Overall, the Institute raised nearly $300,000 for 1,000 state-based charities in less than a month.

"The success this year came primarily from the ninety-plus departmental coordinators who worked diligently for almost six weeks to encourage participation in their respective departments," Steele says.

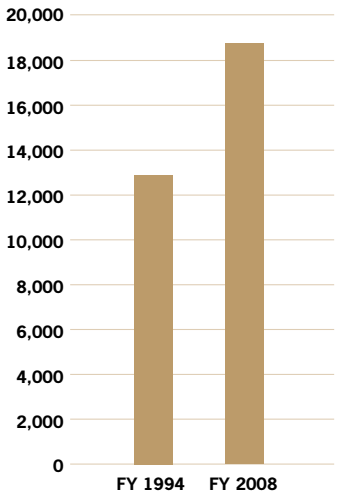
# ENROLLMENT AND DEGREES

## TOTAL HEADCOUNT ENROLLMENT

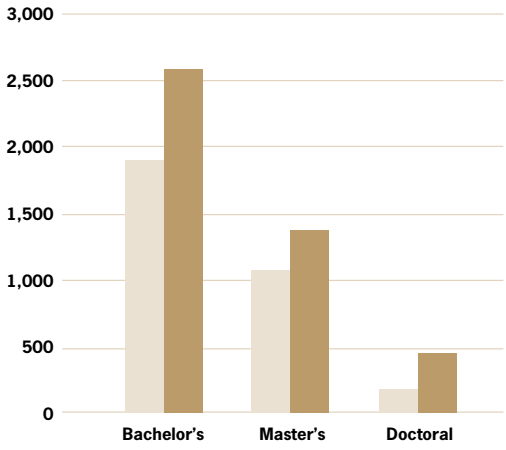
| HEADCOUNT ENROLLMENT | FY 1994 | FY 2008 | PERCENT INCREASE/ (DECREASE) |
|---|---|---|---|
| Undergraduate | 9,181 | 12,565 | 37% |
| Graduate | 3,664 | 6,177 | 69% |
| Total | 12,845 | 18,742 | 46% |
| Full-time Equivalent (FTE) Enrollment | 12,705 | 17,832 | 40% |

FY 1994 FY 2008

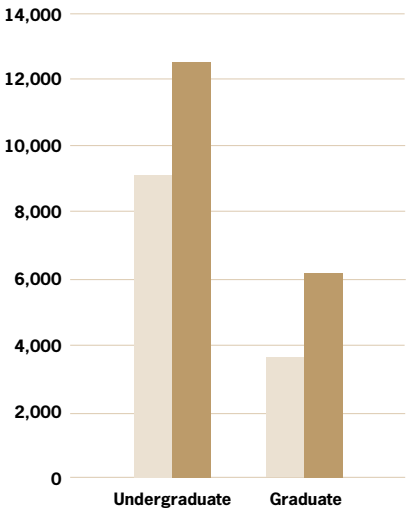
### COMPARISON OF TOTAL HEADCOUNT ENROLLMENT FY 1994 AND FY 2008



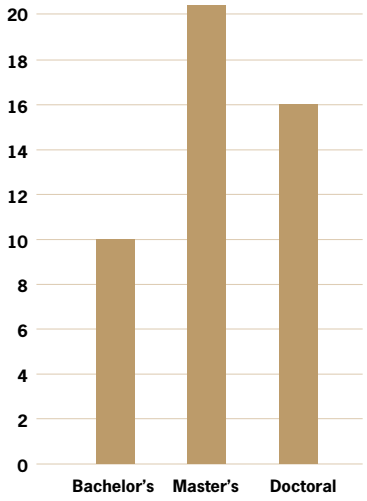

### COMPARISON OF DEGREES AWARDED BY LEVEL FY 1994 AND FY 2008




### COMPARISON OF HEADCOUNT ENROLLMENT BY LEVEL FY 1994 AND FY 2008




### NEW DEGREE PROGRAMS 1994-2008




## NEW DEGREES SINCE 1994

**Bachelor's**
- Biochemistry
- Biomedical Engineering
- Computational Media
- Economics & International Affairs
- Environmental Engineering
- Global Economics & Modern Languages
- International Affairs & Modern Languages
- Materials Science and Engineering*
- Polymer and Fiber Engineering*
- Public Policy

**Master's**
- Bioengineering
- Bioinformatics
- Biomedical Engineering
- Building Construction & Facility Management
- Business Administration*
- **Business Administration in Management of Technology**
- Computational Science and Engineering
- Digital Media*
- Electrical & Computer Engineering
- Global Executive MBA
- Human-Computer Interaction
- Industrial Design
- Information Security
- International Affairs
- International Logistics
- Materials Science and Engineering*
- Medical Physics*
- Music Technology
- Paper Science & Engineering
- Prosthetics & Orthotics
- Quantitative & Computational Finance

**Doctoral**
- Algorithms, Combinatorics, & Optimization
- Applied Physiology
- Bioengineering
- Bioinformatics
- Biomedical Engineering
- **Computational Science and Engineering**
- Digital Media
- Electrical & Computer Engineering
- History & Sociology of Technology & Science*
- Human Centered Computing
- **International Affairs, Science, and Technology**
- Materials Science & Engineering
- **Operations Research**
- Paper Science & Engineering
- Public Policy
- **Robotics**

*Updated programs

# 2007-2008 TIMELINE

## July

Georgia Tech is the first university campus to host RoboCup, the world's premier robotics competition with more than 1,700 students and faculty from 37 countries participating.

South Korea's Woosong University names John E. Endicott, professor in the Sam Nunn School of International Affairs and director of the Center for International Strategy, Technology, and Policy, as its next president and vice chancellor.

Georgia Tech is named the top overall producer of African American engineers in the United States by *Diverse: Issues in Higher Education* magazine.

Women's tennis All-American Kristi Miller, golf All-American Roberto Castro, and swimming standout Ofer Finkler are named 2007 Academic All-Americans by *ESPN The Magazine*.

Provost Gary Schuster, Senior Vice Provost for Research and Innovation Mark Allen, and Mechanical Engineering Professor Paul Neitzel give expert testimony before two subcommittees of the U.S. House Committee on Science and Technology.

## August

*U.S. News & World Report* ranks Georgia Tech seventh among the nation's public universities, the highest ranking in Institute history.

Georgia Tech's fall enrollment exceeds 18,000 for the first time in Institute history. The increase is attributed largely to higher retention and growth in graduate enrollment.

Seven Tech students are selected as finalists in Fresh Wood, a national student furniture competition.

Sting 1, an autonomous Porsche Cayenne designed by Tech researchers, is one of thirty-five vehicles to advance to the National Qualifying Event of the Defense Advanced Research Projects Agency's (DARPA) Urban Challenge.

Georgia Tech implements the GT Emergency Notification System, which allows urgent messages to be distributed quickly to students, faculty, and staff by e-mail, voice mail, and text messages.

Mark Allen is named senior vice provost for Research and Innovation, a position in which he will be instrumental in setting the Institute's research and economic development agenda and strategic direction.

## September

MIT's *Technology Review* magazine names Georgia Tech researchers Karen Liu and Xudong Wang to its list of the world's top innovators under the age of 35.

The Georgia Tech Glee Club performs at Hi-Fi Buys Amphitheatre with Country Music Association Entertainer of the Year Kenny Chesney.

Krishan Ahuja, Regents' Professor in the Guggenheim School of Aerospace Engineering, is appointed director and general manager of Georgia Tech Ireland, which helps companies on both sides of the Atlantic bridge the gap between academic discovery and commercial success.

Bonnie Heck Ferri, professor and associate chair for graduate affairs in the School of Electrical and Computer Engineering, receives the IEEE Education Society's 2007 Hewlett-Packard/Harriet B. Rigas Award.

The National Institutes of Health awards more than $31 million over five years to a partnership of Atlanta academic, research, and healthcare institutions—including Georgia Tech—to accelerate the translation of research discoveries into healthcare innovations for patients.

WREK is named "Best Overall Radio Station" in *Creative Loafing*'s Best of Atlanta 2007 issue.


## October

CNBC films an episode of "Mad Money" with Jim Cramer in the Jennings Courtyard at the Management Building—part of the hit stock-picking show's "Back to School" college tour.

Electrical and Computer Engineering Professor Steve McLaughlin is named Tech's first vice provost for International Initiatives and will provide leadership and strategic direction for Tech's expanding international relationships and study abroad and exchange programs.

Mechanical Engineering Professor Ray Vito becomes Tech's first vice provost of Graduate and Undergraduate Studies.

A dedication ceremony opens Technology Enterprise Park (TEP), an eleven-acre complex at North Avenue and Northside Drive affiliated with Georgia Tech. TEP provides a specialized work environment geared toward second-stage biotechnology start-up companies.

Tech receives approval for an Executive MBA in Management of Technology aimed at rising professionals in tech-heavy fields.

The Office of Human Resources announces a flexible work policy that allows supervisors and managers to approve telecommuting, compressed work weeks, flexible start and end times, and job sharing.

President Wayne Clough and IBM CEO Sam Palmisano are honored by the Council on Competitiveness for co-chairing the Council's National Innovation Initiative, which developed a national action agenda to bolster U.S. competitiveness and innovation.

Elliot Moore, assistant professor of Electrical and Computer Engineering at Georgia Tech Savannah, receives a Presidential Early Career Award for Young Scientists and Engineers (PECASE), the highest honor bestowed by the U.S. government on scientists and engineers beginning their careers.

Four Georgia Tech research scientists—Yuhong Fan, Melissa Kemp, Francesca Storici, and Ming Yuan—are among twenty-nine Georgia Cancer Coalition Distinguished Cancer Scholars selected in 2008. Each is funded at $50,000 annually for five years to pursue the most promising areas of cancer research.

U.S. Naval Academy football coach Paul Johnson accepts the head football coaching position at Georgia Tech. Johnson coached five seasons at Georgia Southern University (62-10), winning back-to-back 1-AA National Championships in 1999 and 2000.

"Flock," the newest audience-participatory work composed by Assistant Professor of Music Jason Freeman, premieres at Miami's Carnival Center for the Performing Arts.

Georgia Tech ranks No. 12 for in-state students in Kiplinger's "100 Best Values in Public Colleges," up from No. 13 in 2007.

The first annual campus-wide Data Cleanup is conducted with the goal of developing a campus culture that minimizes the electronic storage of sensitive information and protects it rigorously.

A new interdisciplinary PhD program in Computational Science and Engineering is announced.

Nancey Green Leigh, professor of City and Regional Planning in the College of Architecture, provides congressional testimony on the unintended consequences of the Comprehensive Environmental Response, Compensation, and Liability Act and how brownfields affect prospects for urban revitalization.

Tech researchers are part of a three-continent, multi-organizational effort dubbed "Operation Jupiter" that successfully identifies and shuts down manufacturers who were flooding Southeast Asia with ineffective counterfeit anti-malarial drugs.

## November

Four Georgia Tech professors are elected Fellows of the American Association for the Advancement of Science: Judith Curry (Earth and Atmospheric Sciences), Randall Engle (Psychology), Cheryl Leggon (Public Policy), and Rick Trebino (Physics).

The Institute receives approval for the nation's second doctoral degree in robotics. The program will encompass mechanisms, controls, perception, autonomy, and artificial intelligence.

A team of graduate students from Georgia Tech and Emory University places second in the Idea to Product Global Competition with a plan to commercialize technology enabling more accurate cancer diagnosis.

## December

Professor William Wepfer is named the Eugene C. Gwaltney Jr. Chair of the School of Mechanical Engineering, replacing longtime chair Ward Winer, who retired after serving on the Tech faculty since 1969. Wepfer had most recently served as Tech's vice provost for Distance Learning and Professional Education.

## January

"Icarus," the solar-powered house that placed sixth in the U.S. Department of Energy's Solar Decathlon in Washington, D.C., opens for tours on the south lawn of the West Architecture Building.

## February

Ken Paulson, editor and senior vice president of *USA Today* and USA Today.com, delivers a campus address on "Rebooting America: News for a New Generation" as part of Finding Common Ground, a student initiative that seeks to include diverse voices in an ongoing campus dialogue.

"Journalism 3G: The Future of Technology in the Field," hosted by the Graphics, Visualization, & Usability Center, brings together seasoned news correspondents with computer scientists and technology and media executives to discuss how new technologies might alter the news business in the future.

Tech is named to the 2007 President's Higher Education Community Service Honor Roll in recognition of its contributions to the Gulf Coast following Hurricane Katrina.

G. Wayne Clough is selected to be the twelfth secretary of The Smithsonian Institution in Washington, D.C. and announces he will step down on June 30 after fourteen years as president of Georgia Tech.

Four Tech faculty members receive fellowships from the Alfred P. Sloan Foundation: Adam Kalai (Computing), Nick Feamster (Computing), King Jordan (Biology), and Dan Breznitz (International Affairs).

Georgia Tech receives the 2008 American Forest and Paper Association College and University Recycling Award for recycling 376 tons of paper last year.

Students from ten universities come to the Tech campus for the National Idea-to-Product Competition for Social Entrepreneurship. Georgia Tech's entry is a Tongue Drive System that can be used to access a computer, operate a powered wheelchair, or control the user's environment.

Regents' Professor of Industrial and Systems Engineering Donald Ratliff joins the National Science Foundation (NSF) Advisory Committee for the Office of Polar Programs, which directs NSF funding for basic research and operational support in the Arctic and the Antarctic. Ratliff will offer his expertise in the area of supply chain and logistics.

All-American Amanda McDowell becomes the first Yellow Jacket to win an individual national championship in tennis at the NCAA Singles Championships.

A campus memorial service honors the memory of John Patrick Crecine, Georgia Tech's ninth president, who died April 28. Crecine, 68, served as Tech president from 1987-1994. The Hemphill Avenue Apartments are renamed the John Patrick Crecine Residence Hall in his memory.

The naming of the G. Wayne Clough Undergraduate Learning Commons is approved. Groundbreaking is expected in late 2008 on the 230,000-square-foot, $85 million facility, which will be located next to the Library and encompass science laboratories, classrooms, undergraduate academic services, and an information commons.

Catherine Murray-Rust is appointed dean of Libraries. Most recently, Murray-Rust was library dean at Colorado State University, where she oversaw five facilities with a staff of 100. Murray-Rust succeeds Richard Meyer, who retired over the summer.

## March

The Ivan Allen College of Liberal Arts presents media entrepreneur and philanthropist Ted Turner with the 2008 Ivan Allen Jr. Prize for Progress and Service.

Douglas Allen, interim dean of the College of Architecture, receives the Governor's Award for Historic Preservation Stewardship in recognition of his efforts to preserve the College's buildings.

The women's tennis team and head coach Bryan Shelton are honored by the Georgia General Assembly and Gov. Sonny Purdue for winning their third consecutive Atlantic Coast Conference title, the National Team Indoor Championship, and the NCAA Women's Tennis title.

Tech requests all departments and students to turn off the lights in their offices and dorm rooms during Earth Hour on March 29.

## April

Interim Dean of Computing James D. Foley is elected to the National Academy of Engineering. Foley also receives the 2008 Distinguished Professor Award, the highest honor Georgia Tech bestows on faculty members.

The Georgia Tech Glee Club performs at Carnegie Hall, then heads for England, Scotland, and Wales for a ten-day tour.

In conjunction with Earth Day, Georgia Tech celebrates Think Green Week, an effort to educate the campus community on environmental awareness and renew its commitment to sustainability.

The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University—the nation's first joint academic department between a public and a private university—celebrates its tenth anniversary.

Provost and Vice President for Academic Affairs Gary Schuster is appointed interim president, effective July 1.

## May

Alan Balfour is named dean of the College of Architecture, succeeding the late Thomas D. Galloway.

As gasoline prices hit record levels, Georgia Tech begins a vanpool program that matches employees and students who live in the same geographic areas. Riders contribute to the operating cost of the vans through a monthly fee.

The Athletic Association begins using solar breakers and photocells at Bobby Dodd Stadium, conserving energy by reducing use of the lights during the day.

## June

*ESPN the Magazine* names Yellow Jacket tennis standout Kristi Miller as its At-Large Academic All-American of the Year. Miller, who graduated from Georgia Tech in four years with a 4.0 GPA in History, Technology, and Society, earned the No. 1 national ranking in singles during her career and led the Yellow Jackets to an NCAA Title in 2007.

The Klaus Advanced Computing Building, home to the College of Computing and the School of Electrical and Computer Engineering, receives Leadership in Energy and Environmental Design (LEED) Gold certification. The Management Building received Silver certification in 2003.

# IN APPRECIATION

The spring of 2008 marked a time of major transition as Georgia Tech bade farewell to longtime President G. Wayne Clough and Executive Vice President for Administration and Finance Robert K. Thompson. These two visionary and dynamic leaders literally reshaped the Tech campus and brought the Institute into the twenty-first century.

## G. Wayne Clough

The fourteen-year tenure of President G. Wayne Clough was a genuinely transformative era for Georgia Tech. A Georgia native and the first alumnus to be president, Clough demonstrated a unique ability to move the Institute forward on all fronts simultaneously.

On the academic front, Clough's leadership improved the quality of the student body while simultaneously increasing enrollment. The undergraduate experience was energized, and innovative interdisciplinary degrees made the Institute more well-rounded.

The research enterprise more than doubled during his tenure, as Georgia Tech moved increasingly into emerging interdisciplinary fields.

A civil engineer by profession, Clough more than doubled the square footage of the campus, overseeing the construction of striking, innovative clusters of buildings surrounded by beautiful landscaping. Environmental sustainability became a major theme, not only in the curriculum but also in the operation of the campus.

Perhaps Clough's most salient talent was his ability to forge partnerships and align resources across organizations. Close to home, he spearheaded a unique partnership with Emory University to pursue education, research, and economic development in biotechnology and worked with adjacent neighborhoods to invigorate the areas surrounding campus. Farther afield, he promoted strategic international research and education platforms and partnerships that have made Tech one of the world's few truly global universities.

Clough's expertise also gave Tech a much higher profile in Washington, D.C. Appointed by the President to the President's Council of Advisors on Science and Technology in 2001 and to the National Science Board in 2004, he became the only person to serve simultaneously on both bodies.

Georgia Tech's success during the past fourteen years is inextricably linked with Wayne Clough's passion, drive, and ability to articulate and realize an inspiring vision of Georgia Tech's future. The Tech community wishes him well in his new role as secretary of The Smithsonian Institution.

"Georgia Tech is one of our state's greatest assets, and Wayne Clough has been an exemplary leader of his alma mater," says P. Russell Hardin, president of the Robert W. Woodruff Foundation. "He was the right man at the right time for Tech."

## Robert K. Thompson

When Executive Vice President for Administration and Finance Robert K. Thompson arrived at Georgia Tech in 1995, the campus was preparing for the single most high-profile event in its history: serving as the Olympic Village for the 1996 Centennial Olympic Games.

As Thompson assumed responsibility for completing the construction and renovation required for the Tech campus to host the world, he soon realized the potential of the Olympic facilities to be a catalyst for an even bolder reshaping of the century-old campus. During the next thirteen years, his visionary thinking and determination produced that transformation.

The vibrancy that now characterizes the once blighted sector of Midtown Atlanta occupied by Technology Square is perhaps the most illustrative example of Thompson's efforts. Five years after its opening, Technology Square has not only provided a dynamic new environment for students to learn, work, and play, but has also served as a catalyst for extensive redevelopment in the adjacent areas of Midtown.

"What distinguishes Bob is his openness to new ideas, his broad knowledge of what it takes to succeed, and his willingness to help others improve and grow," says former President Wayne Clough. "Bob is one of the top people in his business and he has been one of the chief factors in Georgia Tech's rise to prominence as one of the nation's top universities."

# ADMINISTRATION OF THE GEORGIA INSTITUTE OF TECHNOLOGY

**Gary B. Schuster**
*Interim President, Provost, and Vice President for Academic Affairs*

**Mark G. Allen**
*Senior Vice Provost Research and Innovation*

**Anderson D. Smith**
*Senior Vice Provost Academic Affairs*

**Nelson C. Baker**
*Vice Provost Distance Learning and Professional Education*

**H. Wayne Hodges**
*Vice Provost Enterprise Innovation Institute*

**Jack R. Lohmann**
*Vice Provost Institutional Development*

**Steven W. McLaughlin**
*Vice Provost International Initiatives*

**Raymond P. Vito**
*Vice Provost Graduate and Undergraduate Studies*

**Alan H. Balfour**
*Dean College of Architecture*

**James D. Foley**
*Interim Dean College of Computing*

**Don P. Giddens**
*Dean College of Engineering*

**Sue V. Rosser**
*Dean Ivan Allen College of Liberal Arts*

**Steven R. Salbu**
*Dean College of Management*

**Paul L. Houston**
*Dean College of Sciences*

**Catherine Murray-Rust**
*Dean and Director Libraries*

**Steven G. Swant**
*Executive Vice President Administration and Finance*

**Stephen E. Cross**
*Vice President and Director Georgia Tech Research Institute*

**William D. Schafer**
*Vice President Student Affairs*

**Barrett H. Carson**
*Vice President Development*

# A LEGACY OF STRATEGIC GROWTH

ANNUAL REPORT 2008

# A LEGACY OF STRATEGIC GROWTH

FINANCIAL REPORT 2008

Georgia Institute of Technology

# Message from the Executive Vice President for Administration and Finance

This Fiscal Year 2008 Annual Financial Report reflects the continued commitment of the Georgia Institute of Technology administration to provide an annual compilation of the Institute's financial position and performance, thereby documenting the growth and health of the Institute over time for its many benefactors, constituents, friends, and supporters. It presents the Institute's general purpose unaudited financial statements and accompanying footnotes for the Fiscal Year 2008 ending June 30, 2008. It should be noted that the Georgia Institute of Technology is one of the thirty-five (35) institutions that comprise the University System of Georgia governed by the Board of Regents. The Institute's financial statements are audited annually by the State of Georgia Department of Audits in its annual audit of the University System. Their audited financial statements will be available for review at "fin-services@gatech.edu."

The Fiscal Year 2008 financial report for the Institute incorporates Governmental Accounting Standards Board (GASB) Statements 34, 35, and 39, first required in FY2004, to enhance the understanding of the following three groups of financial statement users:

- Those to whom government is primarily accountable (citizens)
- Those who directly represent citizens (legislative and oversight bodies)
- Those who lend or participate in the lending process (investors & creditors)

Three basic financial statements are presented: Statement of Net Assets (the Balance Sheet); Statement of Revenues, Expenses, and Changes in Net Assets (the Income Statement); and Statement of Cash Flows. It is important to note that GASB treats state appropriations as "non-operating income" rather than "operating income," a presentation requirement that makes it appear that Georgia Tech and other public colleges and universities have an "operating loss" since state appropriations are not considered operating income. A full picture of the year's operations can be seen from the "bottom line" of the Statement of Revenues, Expenses, and Changes in Net Assets. GASB standards also require the discrete reporting of affiliated organizations in the Institute's audited Financial Statements. For this unaudited Annual Financial Report, affiliate information is included in the notes.

Note 1 to the financial statements recognizes the significant contributions of six separately incorporated cooperative organizations to the annual operation and performance of the Georgia Institute of Technology. These six cooperative organizations provide the means and support to build facilities and purchase equipment; to receive and invest contributions; to perform sponsored research and services and license intellectual property; to facilitate technology transfer and economic development; to provide programs and facilities for intercollegiate athletics; and to inform and promote alumni interest in the Institute. Together they add significantly to Institute assets and revenues for programs and services, and ultimately enhance the Institute's performance of its mission.

This Annual Financial Report demonstrates the commitment and the progress Georgia Tech has made in its quest to become the defining technological university of the twenty-first century. This quest includes a campus-wide effort to build an administrative, support, and capital asset infrastructure equal to that task while emphasizing human values that lie at the core of the educational mission of the Institute.

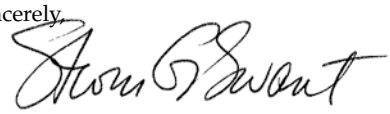
Fiscal Year 2008 marked the fourteenth year of significant Georgia Tech accomplishments under the leadership of President G. Wayne Clough, who departed his alma mater in June to become secretary of The Smithsonian Institution. Provost Gary B. Schuster—who served as dean of the College of Sciences for twelve years—is serving as interim president while the search for a new president is under way.

In addition, Robert K. Thompson retired from the position of executive vice president for Administration and Finance after thirteen years with the Institute. Clough and Thompson led Georgia Tech through a period of dramatic and highly strategic growth in both the size and stature of the Institute. Their contributions to the success of Georgia Tech are highlighted in tributes that appear on page 24 of the President's Annual Report.

This Annual Financial Report highlights some of the end results of the strategic visioning, teamwork, dedication, and focus of the many Georgia Tech faculty, students, staff, and supporters on and off the campus. Efforts to improve the Institute's capital infrastructure and administrative processes and systems have touched all departments and employees of the campus, and enhanced the achievement of academic goals and plans. The Institute continued to receive good audit reports with no major findings in the many federal and state audits conducted annually. Best practice programs continue to be emphasized in business and finance operations throughout the campus. Special efforts have continued to enhance information security in all business areas and to protect Institute assets from external intrusion. The Institute's physical development continues to evolve with new construction, infrastructure, renovations, and landscape improvements focused on strategic plans and sustainable development. FY2008 has been another year of major progress toward the Institute's mission to be the defining technological university of the twenty-first century.

Employees in Administration and Finance and throughout the academic and other major divisions of the Institute made significant contributions to the performance highlighted in this Annual Financial Report, and I wish here to acknowledge and praise their efforts to move the Institute forward in FY2009. A great university is characterized by disciplined people engaged in disciplined thought leading to disciplined action, an apt description of the Georgia Tech team. A special thanks goes to members of the Administration and Finance management team listed on the facing page. This team continues to play key leadership roles in the success of the Institute.

Sincerely,



Steven G. Swant
Executive Vice President
Administration and Finance

## ADMINISTRATION AND FINANCE

Steven G. Swant
*Executive Vice President for Administration and Finance*

Rosalind R. Meyers
*Associate Vice President for Auxiliary Services*

Charles G. Rhode
*Associate Vice President for Facilities*

Joel E. Hercik
*Associate Vice President for Financial Services*

Barry Edward "Chuck" Donbaugh
*Associate Vice President for Human Resources*

John K. Mullin
*Associate Vice President and Associate Vice Provost for Information Technology and Chief Information Officer*

Phillip W. Hurd
*Director of Internal Auditing*

Randy A. Nordin
*Chief Legal Advisor*

JulieAnne Williamson
*Acting Executive Director of Organizational Development*

John Majeroni
*Executive Director of Real Estate Development*

Patrick J. McKenna
*Executive Director for Affiliated Organizations*

Teresa Crocker
*Director, Security and Police*

Jane-Allen Shope
*Executive Secretary to the Executive Vice President*

Cover image: Exterior of Marcus Nanotechnology Building

## GEORGIA INSTITUTE OF TECHNOLOGY STATEMENT OF NET ASSETS
(dollars in thousands)

| | Primary Government June 30, 2007 (audited) | Primary Government June 30, 2008 (unaudited) | Component Units June 30, 2008 (unaudited) |
|---|---|---|---|
| **ASSETS** | | | |
| Current Assets | | | |
| Cash and Cash Equivalents | $100,953 | $52,021 | $76,195 |
| Short-term Investments | 135 | 144 | 6,792 |
| Accounts Receivable, net | | | |
| Receivables—Federal Financial Assistance | 2,001 | 4,521 | |
| Receivables—State General Appropriations Allotment | | | |
| Receivables—Other | 22,655 | 13,753 | 36,503 |
| Leases Receivable | | | 6,461 |
| Pledges Receivable | | | 5,517 |
| Due from Component Units | 33,683 | 72,822 | 437 |
| Due from Primary Government | | | |
| Inventories | 293 | 322 | 8 |
| Prepaid Items | 12,174 | 42,441 | 6,192 |
| Notes and Mortgages Receivable | | | 1,235 |
| Other Assets | | | 63,239 |
| Total Current Assets | 171,894 | 186,024 | 202,579 |
| Noncurrent Assets | | | |
| Noncurrent Cash | - | - | 36,093 |
| Due from Component Units | | | 89,144 |
| Due from Primary Government | | | |
| Investments (Including Real Estate) | 61,280 | 63,531 | 1,589,331 |
| Notes Receivable, net | 8,722 | 9,396 | |
| Leases Receivable | | | 169,327 |
| Pledges Receivable | | | 8,820 |
| Other Assets | | | 82,658 |
| Capital Assets, net | 1,261,605 | 1,420,414 | 252,127 |
| Total Noncurrent Assets | 1,331,607 | 1,493,341 | 2,227,500 |
| TOTAL ASSETS | 1,503,501 | 1,679,365 | 2,430,079 |
| **LIABILITIES** | | | |
| Current Liabilities | | | |
| Accounts Payable | 19,456 | 19,507 | 25,493 |
| Salaries Payable | 938 | 1,180 | |
| Benefits Payable | 169 | 307 | |
| Contracts Payable | 877 | 1,930 | |
| Deposits | 23,435 | 20,557 | 8,421 |
| Deferred Revenue | 14,213 | 15,245 | 44,189 |
| Other Liabilities | 3,659 | 3,504 | 3,747 |
| Deposits Held for Other Organizations | 10,310 | 13,672 | |
| Due to Component Units | | | 437 |
| Due to Primary Government | | | 72,822 |
| Current Portion of Long-term Debt | 12,199 | 18,143 | 79,022 |
| Compensated Absences (Current Portion) | 17,049 | 18,437 | 472 |
| Total Current Liabilities | 102,305 | 112,482 | 234,603 |
| Noncurrent Liabilities | | | |
| Due to Component Units | | | 89,144 |
| Due to Primary Government | | | |
| Lease Purchase Obligations (Noncurrent) | 397,770 | 509,595 | 95,587 |
| Deferred Revenue (Noncurrent) and Other Noncurrent Liabilities | 5,619 | 5,425 | 668,482 |
| Compensated Absences (Noncurrent) | 14,428 | 14,846 | |
| Total Noncurrent Liabilities | 417,817 | 529,866 | 853,213 |
| TOTAL LIABILITIES | 520,122 | 642,348 | 1,087,816 |
| **NET ASSETS** | | | |
| Invested in Capital Assets, net of related debt | 851,635 | 892,894 | 8,685 |
| Restricted for | | | |
| Nonexpendable | 53,099 | 47,864 | 409,731 |
| Expendable | 30,748 | 27,544 | 495,608 |
| Capital Projects | 49,600 | 66,196 | 12,605 |
| Unrestricted | (1,704) | 2,519 | 415,633 |
| TOTAL NET ASSETS | 983,378 | 1,037,017 | 1,342,262 |

## GEORGIA INSTITUTE OF TECHNOLOGY STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET ASSETS
(dollars in thousands)

| | Primary Government June 30, 2007 (audited) | Primary Government June 30, 2008 (unaudited) | Component Units June 30, 2008 (unaudited) |
|---|---|---|---|
| REVENUES | | | |
| Operating Revenues | | | |
| Student Tuition and Fees (Net of Allowance for Doubtful Accounts) | $150,862 | $161,888 | |
| Less: Scholarship Allowances | 30,308 | 26,738 | |
| Grants and Contributions | | | 72,212 |
| Endowment Income (Per Spending Plan) | | | 4,880 |
| Federal Appropriations | | | |
| Grants and Contracts | | | |
| Federal | 271,377 | 287,999 | |
| State | 14,459 | 17,237 | |
| Other | 145,132 | 149,509 | |
| Sales and Services | 19,984 | 23,942 | 34,107 |
| Rents and Royalties | 1,328 | 1,254 | 59,095 |
| Auxiliary Enterprises | | | |
| Residence Halls | 40,453 | 49,249 | |
| Bookstore | 1,208 | 1,902 | |
| Food Services | 16,550 | 16,943 | |
| Parking/Transportation | 12,328 | 13,200 | |
| Health Services | 5,608 | 5,948 | |
| Intercollegiate Athletics | | | |
| Other Organizations | 7,709 | 6,647 | |
| Other Operating Revenues | 11,241 | 12,377 | 382,937 |
| Total Operating Revenues | 667,931 | 721,357 | 553,231 |
| EXPENSES | | | |
| Operating Expenses | | | |
| Salaries | | | |
| Faculty | 231,264 | 245,468 | |
| Staff | 236,894 | 263,916 | 18,452 |
| Benefits | 93,698 | 104,558 | 4,216 |
| Other Personal Services | 4,263 | 548 | 1,306 |
| Travel | 16,646 | 16,617 | 4,181 |
| Scholarships and Fellowships | 14,118 | 10,920 | 7,075 |
| Utilities | 24,010 | 36,396 | 1,042 |
| Supplies and Other Services | 236,485 | 244,424 | 24,809 |
| Depreciation | 61,864 | 57,586 | 10,505 |
| Other Operating Expense | | | 7,497 |
| Payments to or on Behalf of Georgia Institute of Technology | | | 466,501 |
| Total Operating Expenses | 919,242 | 980,433 | 545,584 |
| Operating Income (Loss) | (251,311) | (259,076) | 7,647 |
| NONOPERATING REVENUES (EXPENSES) | | | |
| State Appropriations | 252,569 | 275,144 | - |
| Grants and Contracts | | | |
| Federal | | | |
| State | | | |
| Other | | | |
| Gifts | 8,321 | 5,323 | |
| Investment Income (Endowments, Auxiliary, and Other) | 14,392 | 14,552 | (9,240) |
| Interest Expense (Capital Assets) | (17,133) | (26,375) | (40,821) |
| Other Nonoperating Revenues | 1,750 | (3,371) | |
| Net Nonoperating Revenues | 259,899 | 265,273 | (50,061) |
| Income Before Other Revenues, Expenses, Gains, or Loss | 8,588 | 6,197 | (42,414) |
| Capital Grants and Gifts | | | |
| Federal | | | |
| State | 35,919 | 21,855 | |
| Other | 15,907 | 17,035 | 63 |
| Additions to Permanent Endowments | | | 38,839 |
| Total Other Revenues | 51,826 | 38,890 | 38,902 |
| Increase in Net Assets | 60,414 | 45,087 | (3,512) |
| NET ASSETS | | | |
| Net Assets—Beginning of Year, As Originally Reported | - | 983,378 | 1,345,774 |
| Prior Year Adjustments | | 8,552 | - |
| Net Assets—Beginning of Year, Restated | 922,964 | 991,930 | 1,345,774 |
| Net Assets—End of Year | 983,378 | 1,037,017 | 1,342,262 |

## GEORGIA INSTITUTE OF TECHNOLOGY STATEMENT OF CASH FLOWS
(dollars in thousands)

| | Primary Government June 30, 2007 (audited) | Primary Government June 30, 2008 (unaudited) |
|---|---|---|
| CASH FLOWS FROM OPERATING ACTIVITIES | | |
| Tuition and Fees | $120,615 | $134,653 |
| Grants and Contracts (Exchange) | 424,583 | 447,227 |
| Sales and Services of Educational Departments | 19,959 | 23,702 |
| Payments to Suppliers | (368,137) | (407,771) |
| Payments to Employees | (464,300) | (507,336) |
| Payments for Scholarships and Fellowships | (14,118) | (10,920) |
| Loans Issued to Students and Employees | (3,325) | (3,131) |
| Collection of Loans to Students and Employees | 2,793 | 2,457 |
| Auxiliary Enterprise Charges: | | |
| Residence Halls | 40,529 | 49,473 |
| Bookstore | 1,222 | 1,913 |
| Food Services | 16,552 | 16,937 |
| Parking/Transportation | 12,344 | 13,231 |
| Health Services | 5,605 | 5,951 |
| Intercollegiate Athletics | | |
| Other Organizations | 7,673 | 6,651 |
| Other Receipts (Payments) | 17,701 | (10,299) |
| Net Cash Provided (Used) by Operating Activities | (180,304) | (237,262) |
| CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES | | |
| State Appropriations | 252,569 | 275,144 |
| Agency Funds Transactions | 7,561 | 3,362 |
| Other Nonoperating Receipts (Used) | 5,588 | 1,568 |
| Gifts and Grants Received for Other Than Capital Purposes | 8,321 | 5,323 |
| Net Cash Flows Provided by Noncapital Financing Activities | 274,039 | 285,397 |
| CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES | | |
| Capital Grants and Gifts Received | 8,889 | 20,339 |
| Proceeds from Sale of Capital Assets | | 217 |
| Purchases of Capital Assets | (57,603) | (91,525) |
| Principal Paid on Capital Debt and Leases | (10,193) | (14,226) |
| Interest Paid on Capital Debt and Leases | (17,107) | (24,164) |
| Net Cash Used by Capital and Related Financing Activities | (76,014) | (109,359) |
| CASH FLOWS FROM INVESTING ACTIVITIES | | |
| Proceeds from Sales and Maturities of Investments | 35 | |
| Interest on Investments | 8,293 | 19,578 |
| Purchase of Investments | (486) | (7,286) |
| Net Cash Provided (Used) by Investing Activities | 7,842 | 12,292 |
| Net Increase/Decrease in Cash | 25,563 | (48,932) |
| Cash and Cash Equivalents - Beginning of Year | 75,390 | 100,953 |
| Cash and Cash Equivalents - End of Year | 100,953 | 52,021 |
| RECONCILIATION OF OPERATING LOSS TO NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES | | |
| Operating Income (Loss) | (251,311) | (259,076) |
| Adjustments to Reconcile Net Income (Loss) to Net Cash Provided (Used) by Operating Activities | | |
| Depreciation | 61,864 | 57,586 |
| Change in Assets and Liabilities: | | |
| Receivables, net | 4,662 | (32,757) |
| Inventories | 10 | (29) |
| Other Assets | (8,740) | (3,082) |
| Accounts Payable | 15,793 | 430 |
| Deferred Revenue | (5,809) | 839 |
| Other Liabilities | (354) | (2,979) |
| Compensated Absences | 3,581 | 1,806 |
| Net Cash Provided (Used) by Operating Activities | (180,304) | (237,262) |

# GEORGIA INSTITUTE OF TECHNOLOGY
# NOTES TO THE FINANCIAL STATEMENTS
June 30, 2008

## SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements presented in this report are modified statements issued under reporting guidelines established by the Governmental Accounting Standards Board (GASB). The statements focus on the financial condition, results of operations, and cash flows of the Institute as a whole, with resources classified for accounting and reporting purposes into four net asset categories: invested in capital assets, net of related debt; restricted-nonexpendable; restricted-expendable; and unrestricted. The basis of accounting is full accrual, including capitalization and depreciation of equipment and fixed assets.

The unaudited financial statements are prepared using the economic resources measurement focus and the accrual basis of accounting. Under the accrual basis, revenues are recognized when earned, and expenses are recorded when an obligation has been incurred. All significant intra-Institute transactions have been eliminated. Audited financial statements with accompanying footnote disclosures have not been completed at this time. Copies of the audited financial report will be available upon request.

The financial operations and position of six Institute cooperative organizations are considered component units of the Institute and are included by discrete presentation in the Institute financial statements. Although these organizations operate exclusively to provide the Institute with supplemental resources and support, they are separately incorporated and managed by their own boards. An annual post audit of each organization's financial statements is conducted by independent certified public accountants. These organizations are described below:

**Georgia Tech Foundation Inc.** is incorporated as a nonprofit corporation under the laws of the state of Georgia to promote in various ways the cause of higher education in the state of Georgia, to raise and receive funds for the support and enhancement of the Georgia Institute of Technology, and to aid the Institute in its development as a leading educational institution.

**Georgia Tech Facilities Inc.** is incorporated as a nonprofit corporation under the laws of the state of Georgia. The purpose of Facilities Inc. is to construct buildings and other facilities as may be appropriate to meet the needs and goals of the Georgia Institute of Technology. Facilities Inc. serves as a financing and contracting entity for construction projects on the campus of Georgia Tech, but does not manage buildings after completion.

**Georgia Tech Alumni Association Inc.** is a nonprofit organization formed to assist the Georgia Institute of Technology in alumni relations and to promote education. The Association is dedicated to the interests and welfare of Georgia Tech. Among its many other programs and activities, the Association acts as a fund-raising arm of the Georgia Tech Foundation through solicitation of contributions from alumni and friends of the Institute on behalf of the Foundation.

**Georgia Tech Research Corporation (GTRC)** is a Georgia nonprofit corporation organized and operated exclusively for scientific, literary, and educational purposes. GTRC serves as the contracting agency for all sponsored research activities at Georgia Tech. Additionally, GTRC assists Georgia Tech in obtaining quality research space, enters into long-term leases for specialized research equipment and facilities, and conducts other research support programs for Georgia Tech and its affiliated research programs. It also owns all intellectual property created at Georgia Tech and manages patents, copyrights, and licenses. All funds received by GTRC are used to support various Georgia Tech research programs as approved by the Board of Trustees of GTRC.

**Georgia Tech Athletic Association Inc.** is a nonprofit organization created for the express purpose of aiding the educational programs of the Institute by providing physical training, recreation, and intercollegiate athletic facilities; carrying out its athletic programs; and soliciting gifts, donations, and grants for the purpose of supporting and enhancing the Institute's varsity athletic programs.

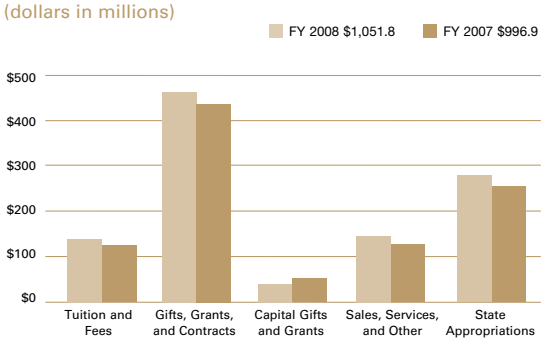
**Georgia Advanced Technology Ventures Inc. (GATV)** is a Georgia nonprofit organization formed to support the Georgia Institute of Technology's technology transfer and economic development mission. GATV provides capital and operating support for technology transfer and economic development activities, including the Advanced Technology Development Center (ATDC) incubator facilities and services to ATDC-affiliated companies.

## GEORGIA INSTITUTE OF TECHNOLOGY COOPERATIVE ORGANIZATIONS

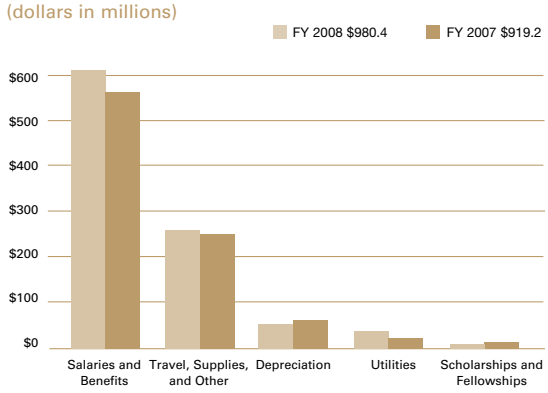
Summary financial data from the financial statements of each cooperative organization is as follows: Year ended June 30, 2008 (dollars in thousands) (unaudited)

| | GEORGIA TECH FOUNDATION | GEORGIA TECH FACILITIES | GEORGIA TECH ALUMNI ASSOCIATION | GEORGIA TECH RESEARCH CORPORATION | GEORGIA TECH ATHLETIC ASSOCIATION | GEORGIA ADVANCED TECHNOLOGY VENTURES |
|---|---|---|---|---|---|---|
| Total Assets | 1,645,780 | 333,148 | 998 | 131,607 | 200,031 | 118,514 |
| Total Liabilities | 438,239 | 339,434 | 727 | 83,454 | 120,266 | 105,696 |
| Unrestricted Net Assets | 390,600 | (16,081) | (178) | 48,153 | (3,091) | 10,594 |
| Restricted Net Assets | 816,941 | 9,795 | 449 | - | 82,856 | 2,223 |
| Net Assets | 1,207,541 | (6,286) | 271 | 48,153 | 79,765 | 12,817 |
| Total Net Assets and Liabilities | 1,645,780 | 333,148 | 998 | 131,607 | 200,031 | 118,513 |
| Revenues | 117,818 | 13,683 | 6,550 | 390,373 | 58,670 | 14,035 |
| Expenditures | 111,539 | 26,368 | 6,800 | 383,294 | 58,382 | 18,259 |
| Net Increase (Decrease) | 6,279 | (12,685) | (250) | 7,079 | 288 | (4,224) |
| Net Assets: July 1, 2007 | 1,201,262 | 6,399 | 521 | 41,074 | 79,477 | 17,041 |
| Net Assets: June 30, 2008 | 1,207,541 | (6,286) | 271 | 48,153 | 79,765 | 12,817 |

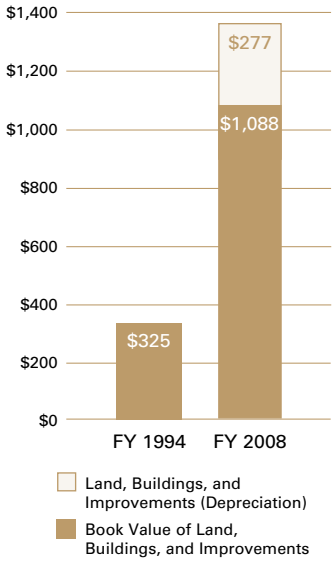
## GEORGIA INSTITUTE OF TECHNOLOGY REVENUE
(dollars in millions)



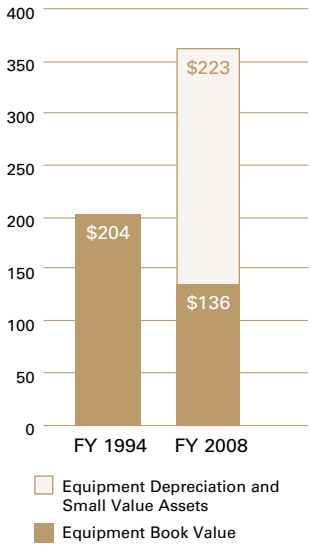

## GEORGIA INSTITUTE OF TECHNOLOGY EXPENSES BY OBJECTS OF EXPENDITURE CLASSIFICATION
(dollars in millions)




## PHYSICAL PLANT ASSETS FOURTEEN-YEAR COMPARISON BOOK VALUE OF LAND, BUILDINGS, AND IMPROVEMENTS
(dollars in millions)

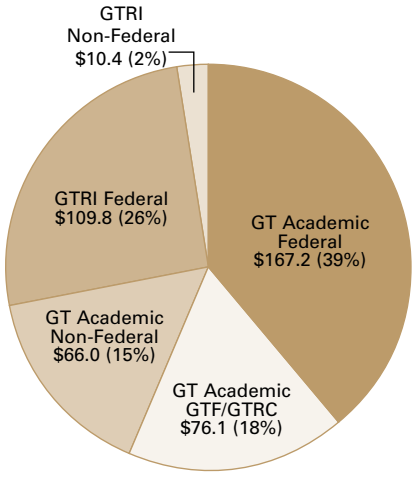



## PHYSICAL PLANT ASSETS FOURTEEN-YEAR COMPARISON BOOK VALUE OF EQUIPMENT
(dollars in millions)

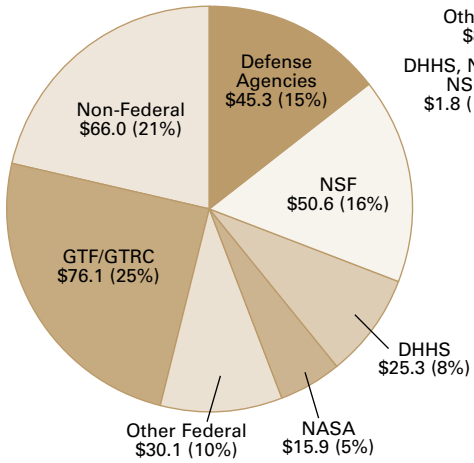



In the bar charts to the left, dark portions for FY 2008 reflect current values under national accounting standards requiring depreciation on all assets and the recent Board of Regents rules increasing the equipment capitalization threshold to $5,000. Light extensions show what would have been reported absent the rule changes.

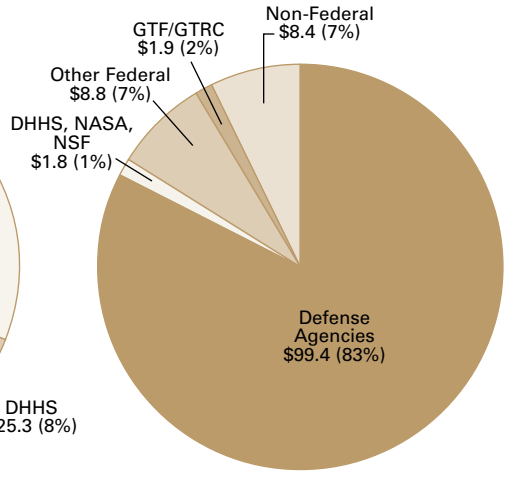
## GEORGIA TECH SPONSORED EXPENDITURES
By major unit and source
FY 2008 (Total: $429.5 Million)




## GEORGIA TECH ACADEMIC SPONSORED EXPENDITURES
By major source
FY 2008 (Total: $309.3 Million)




## GEORGIA TECH RESEARCH INSTITUTE SPONSORED EXPENDITURES
By major source
FY 2008 (Total: $120.3 Million)



# A LEGACY OF STRATEGIC GROWTH

FINANCIAL REPORT 2008