

# WHAT'S NEXT

2016 INSTITUTE  
ANNUAL REPORT



Technology  
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Georgia  
Tech 

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2016 INSTITUTE  
ANNUAL REPORT 

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# WHAT'S NEXT

**The excitement and challenge** that come with continually exploring this question is the fuel that propels our students and faculty. At Georgia Tech, we call upon each other to imagine “What’s Next” and we collaborate with colleagues and associates on and off campus to “Create the Next.” The last year offers many examples of the Tech community boldly conceiving and forging what’s next.

Last April we joined John Portman & Associates in announcing Coda, a 750,000-square-foot expansion of Technology Square that will house the Institute’s high performance computing center. In 13 short years, Tech Square has become the Southeast’s premier innovation neighborhood. With Georgia Tech as Coda’s anchor tenant, the high performance computing center’s interdisciplinary, collaborative environment will enhance Tech Square’s positive impact in Midtown Atlanta, bringing together people in a mixed-use community of innovation, education, and intelligent exchange. The Tech and Atlanta communities eagerly await the completion of this transformational structure in 2018.

Another compelling aspect of what’s next for our community is the Living Building Challenge 3.0 project, a partnership between The Kendeda Fund and Georgia Tech to build what is expected to become the most environmentally advanced education and research building ever constructed in the Southeast. Advancing the Institute’s master campus plan, the Living Building at Georgia Tech will demonstrate the most advanced measures of sustainability possible in the current built environment — serving as a vital architectural model for the 21<sup>st</sup> century.

The Living Building project was made possible by a \$30 million grant from The Kendeda Fund, a profoundly generous expression of philanthropy that helped our \$1.5 billion Campaign Georgia Tech exceed its goal by more than \$300 million upon its December 2015 conclusion. Creating the next would only be a collection of dreams without the philanthropic support of alumni, corporations, foundations, and other friends. The impact of their generosity will be felt for decades to come.

“What’s Next?” is a question that the Georgia Tech community will always embrace with energy and passion. The following pages illustrate the many ways in which we are addressing this vital question.

Sincerely,



**G.P. “BUD” PETERSON**

PRESIDENT, GEORGIA INSTITUTE OF TECHNOLOGY



G.P. “BUD” PETERSON



LIVING OUR  
STRATEGIC PLAN

A critical guidepost in determining what's next is our 25-year strategic plan, launched in 2010. Fiscal year 2016 saw significant progress toward realizing the plan's goals. >>



## Leading Women @ Tech

Maximizing institutional effectiveness is a prominent goal of the strategic plan, and the launch of the Leading Women @ Tech Program directly addresses this aim. The goal of the new program is to create empowerment opportunities for women leaders and build a community of women who will advance a culture of inclusive excellence at Georgia Tech. Currently, only 28 percent of staff positions above director level at Georgia Tech are held by women.

"We are dedicated to creating the next community of leaders who will guide Tech in the 21st century. The representation of diverse women among all levels of leadership is central to our ongoing success," said Julie Ancis, associate vice president of Institute Diversity. "The vision of Leading Women @ Tech aligns with Tech's commitment to an inclusive campus environment, as outlined in our strategic plan."

Co-led by Ancis and Pearl Alexander, executive director of Institute Diversity's Staff Diversity, Inclusion, and Engagement unit, Leading Women @ Tech is designed to strengthen leadership ability, enhance personal and professional growth, and support participants' overall career development.

"Organizations worldwide are taking steps to develop, deploy, and measure effective leadership strategies as a competitive advantage," Alexander said. "Fostering and leveraging the talents of our women leaders at Tech enables them to thrive in their current roles. This prepares them to achieve advancement in ways that are fulfilling throughout various stages of their careers."



>> The first cohort of participants in the Leading Women @ Tech program held an initial meeting and group discussion to launch this strategic, campus-wide initiative. This group is comprised of 16 women staff members from across campus.

## Strategic Plan Advisory Group Releases RFPs

An important milestone for implementation of the strategic plan was the release of requests for proposals by the Strategic Plan Advisory Group (SPAG). In order to support the implementation and institutionalization of the strategic plan, the advisory group released an RFP with multiple levels of funding to encourage new ideas in line with Institute goals. Open to faculty, staff, and students, the RFP will be part of an annual cycle to coincide with fiscal year budgeting. Through its newly established process, the advisory group will have responsibility for review of submitted concepts.

In spring 2016, SPAG reviewed 75 pre-proposals and 20 full proposals. Eight initiatives were selected for SPAG funding as a result of the 2015 RFP process.

"The provision of funds is just one means of support we can provide," said Professor David Frost, chair of the advisory group. "Georgia Tech is a large and diverse institution, and there are good examples of cross-campus collaboration on strategic initiatives. We hope there will be additional value in fostering connections between new ideas and existing initiatives."



DAVID FROST

**LAUNCHING LEADERS** Pearl Alexander (left) and Julie Ancis are heading up the Leading Women @ Tech program, an initiative designed to foster and leverage the talents of Tech's women leaders, thereby enabling them to thrive in their current and future leadership roles.



### Jennifer Hirsch Leads New Sustainable Communities Center

To implement Georgia Tech’s new quality enhancement plan (QEP) for student learning, Serve-Learn-Sustain, the Institute established a new unit within the Office of Undergraduate Education and welcomed its inaugural director, Jennifer Hirsch, Ph.D.

The Center for Serve-Learn-Sustain is co-located with the Center for Academic Enrichment in Clough Commons.

An applied cultural anthropologist specializing in sustainable communities, Hirsch has worked at Northwestern University, The Field Museum, and most recently as an independent consultant. Over the past eight years, she has focused on bringing together diverse populations, including students, administrators, faculty, policymakers, and community leaders, to build on local assets to address community sustainability challenges. She also has experience in higher education administration, focusing on international and experiential education.

“I couldn’t be more excited about moving to Atlanta and Georgia Tech to launch Serve-Learn-Sustain,” Hirsch said. “This innovative initiative is destined to become a national model for university engagement in sustainability, as an environmental, social, and economic imperative. It is an honor to be involved from the very beginning.”



**BIN BASH** Working with the Office of Campus Sustainability, students from various public policy and economics classes developed and implemented a sample waste audit whose goal is to evaluate and weigh the types of waste in campus trash and recycling bins to improve waste diversion programs. The Center for Serve-Learn-Sustain funded a grant to support the project. After examining samples from Clough Commons and various freshman residence halls, the students found that food waste constituted a significant proportion of trash in both locations. One recommendation that emerged from the project was to increase the ratio of recycling bins to trash bins.





## Serve-Learn-Sustain Examines Community Concept

The Center for Serve-Learn-Sustain hosted the Liam’s Legacy Symposium last fall to address the question of what sustainability might look like if the concept of community is taken seriously. The asset-based community engagement model encourages change and development by using the talents and capacities of people within the community. It also focuses on a community’s strengths and not just its needs.

“The Liam’s Legacy Symposium is a wonderful opportunity to join the conversation regarding how Georgia Tech approaches sustainability,” said Kristina Chatfield, program manager with the Center for Serve-Learn-Sustain. “We are engaging community partners at and around Georgia Tech, as we continue to develop programs for the students’ academic experience.”

The event included keynote remarks by Jody Kretzman, one of the co-founders of the Asset-Based Community Development Institute at Northwestern University, and Jenita McGowan, the chief sustainability officer for the City of Cleveland.

Liam’s Legacy celebrates the life and legacy of Liam Rattray, a sustainability activist who had just graduated from Georgia Tech when he was killed by a suspected drunk driver in 2011.

» Above, participants in the Paths to Social Sustainability conference toured the Emerald Corridor, a seven-mile stretch of the Atlanta BeltLine abutting Proctor Creek, located west of the Georgia Tech campus. The goal of the conference was to identify ways to develop stronger and more coordinated social sustainability research, teaching, and action agendas for the Southeast. The conference was co-hosted by the Center for Serve-Learn-Sustain, the Integrated Network for Social Sustainability, College of Design, and College of Engineering, with funding from the National Science Foundation.



# FOSTERING STUDENT INGENUITY AND SUCCESS

Georgia Tech students are renowned for imagining what's next and driving innovation. Supporting their creativity and entrepreneurial success — and recognizing their varied and prestigious achievements — is among the Institute's highest priorities. >>

## Inventure Prize Winner Honored at New ACC Competition



FireHUD, a Georgia Tech student invention designed to protect firefighters, not only won the Institute's InVenture Prize but also received the People's Choice Award at the inaugural ACC InVenture Prize held on the Tech campus.

Zack Braun, a computer engineering major, and Tyler Sisk, an electrical engineering major, invented FireHUD, a head-up display that attaches to a firefighter's mask and measures heart rate, respiratory rate, blood oxygen level, body temperature, external temperature, and other vital signs. This information will help firefighters know if they are overexerting themselves, which can lead to cardiac arrest. The device also transmits data to the incident commander, who can view it on a computer through an app.

The team had already won \$20,000 in the Georgia Tech InVenture Prize when they received the \$5,000 prize from the ACC contest a few weeks later. The prize money will allow them to continue to improve the device, Braun said.

"It felt great representing Georgia Tech," Sisk said. "It made this win a little bit more special because we were here for Tech."

Winners of the ACC InVenture Prize were the BioMetrix team from Duke University (first place and \$15,000) and Contraline from the University of Virginia (second place and \$10,000). Georgia Tech will continue to have a strong presence with the ACC InVenture Prize as the 2017 competition is scheduled to return to campus.

Georgia Tech Provost Rafael L. Bras said that Institute leaders were looking to celebrate the strong academics found in all the ACC schools and agreed that the ACC InVenture Prize was a great way to accomplish that goal.

» Georgia Tech was honored to host the inaugural ACC InVenture Prize competition last spring. The new competition provides a means for celebrating the strong entrepreneurial spirit and academics found in all 15 ACC universities.

**HOT STUFF** A Georgia Tech student invention, FireHUD won the Institute's 2016 InVenture Prize competition. FireHUD is designed to protect firefighters via its head-up display that attaches to a firefighter's mask and measures a variety of vital signs, which helps to avoid overexertion and cardiac arrest.



## Ti:GER Team Wins 2016 Startup Competition

A technology that can better remove heat from electronic devices won Georgia Tech's 2016 Startup Competition, which includes a \$10,000 prize.

The winning team, BanyanTech, evolved through Georgia Tech's Technological Innovation: Generating Economic Results (Ti:GER) program. The program teams Georgia Tech Scheller College of Business MBA students with Emory University law students who work together on commercializing a Ph.D. student's scientific research.

Banyan's Matt Smith, a Ph.D. candidate in materials science and engineering, said that his team was originally focused on connecting computer CPUs to heat sinks in consumer electronics packaging, but that "as a startup we will need to break into a less established industry with small-scale manufacturers that are willing to implement startup materials into their product line." Banyan has shifted their focus to providing thermal solutions for the rapidly growing LED market.

The team also includes first-year MBA students Akshay Ravi and Ajaay Ravi, and second-year Emory law students Forrest Lind and Lorrin Stone.

## Tech Student Team Named Finalist for Startup of the Year

Just six months before being named finalists for the Startup of the Year competition, Josh Lieberman and Isaac Wittenstein were participating in Startup Lab, a class that exposes students to startups and teaches them how to develop a business model. Both were interested in the electric vehicle market. At the same time, Dorrier Coleman was experimenting with electric vehicles as part of his Capstone Design project.

The three Tech students co-founded TEQ Charging, a startup that invented a power strip that allows multiple electric vehicles to be recharged by a single charging point. They traveled to Las Vegas last fall as finalists for Tech.Co's annual Startup of the Year. TEQ also earned second place in Atlan10, which ranks the most innovative young startups in Atlanta.

The launch of TEQ took place during Startup Summer, a part of CREATE-X, which is a Georgia Tech initiative to enhance and support entrepreneurship programs for undergraduate students. The new program is one way the Institute is preparing the nation's next entrepreneurs.

"Georgia Tech has given us the opportunity to be where we are right now," said Lieberman, CEO of the new company. "Without it, we would not have been able to clearly define our business. This definition has allowed us to build a strong business and be a finalist for Tech.Co Startup of the Year."

## Students Spend Summer Launching Startups

Shiv Patel initially thought he had invented a solution to a problem plaguing roommates. His original idea would help people split expenses on everything from pizza delivery to vacation homes.

Patel's is one of the teams picked for last year's Startup Summer, a 12-week internship for Georgia Tech students and recent graduates who want to launch startups based on their own inventions and prototypes. The program teaches students to understand potential customers and the market so they can build a product or service that addresses a real and quantified need.

After that approach showed Patel the faults in his idea, he put aside his original concept and instead created Mercezz, a tool to help people when they're traveling and shopping abroad. The company's first product, TrueCost, helps people avoid foreign transaction fees, unfavorable exchange rates, and miscellaneous fees by providing daily updates showing which of their credit cards provides the best deal on any given day.

"I have motivation, but Startup Summer gives me the support and structure and honest advice I need," said Patel, a computer science major. "Instead of letting me be discouraged when my first idea didn't work, they helped me ask the questions I needed to find something else." Startup Summer is part of CREATE-X.



» Despite the absence of an academic program in journalism, the *Technique* is consistently recognized as one of the best student newspapers in the Southeast.

## Technique Sweeps State Contest

Georgia Tech's student newspaper made a strong showing at last year's Georgia College Press Association (GCPA) Better Newspaper Contest, taking awards in 14 categories.

Topping the *Technique's* many awards was second place in General Excellence.

The *Technique* competed against other student newspapers from across the state, including its neighbors at Georgia State University and the University of Georgia.

"The comment we get the most is how astounded people are that we are able to put out a solid paper without a journalism school," said Brenda Lin, a computational media major and the newspaper's editor-in-chief. "The editors and staff put countless hours into the paper, and we are excited to see our hard work being recognized."

Lin personally won two awards for photography, and several other staff members won individual awards for writing across multiple sections. Seven awards were received for collective staff achievements. For the second year in a row, the publication placed first for layout and design. The *Technique* also took first place in General Advertising Excellence.

» A power strip that enables multiple electric vehicles to be charged simultaneously is an invention of startup TEQ Charging, which was founded by (from left) Mitchell Kelman, Josh Lieberman, Dorrier Coleman, and Isaac Wittenstein.



**MIRACLE MAN** Georgia Tech students and alumni won't soon forget last fall's "Miracle on Techwood Drive." The Yellow Jackets won the 2015 Homecoming game in the final seconds, first by blocking a Florida State field goal attempt, then with Lance Austin's 78-yard touchdown run. The Jackets upset No. 9 Florida State with their 22-16 victory.



**GROWTH IN ADMISSIONS/DIVERSITY**

**Focus Program Sees Significant Growth**

For 25 years, Georgia Tech has offered the Focus graduate recruitment program on the same weekend that the nation celebrates the life and work of Martin Luther King Jr. This program attracts and recruits the nation's best and brightest diverse students to pursue graduate studies and careers in academia.

Last January, 191 students participated in Focus — up from 160 participants in 2015. Among this year's participants, 105 students were female and 143 were Ph.D. candidates. This marks respective increases of 28 and 21 percent from 2015.

"We are proud to have accepted 55 percent women to the Focus program this year, and this trend mirrors Georgia Tech's record-setting freshman class being 41 percent female — the first class to ever top 40 percent," said Andre Dickens, assistant director of outreach initiatives at OMED: Educational Services, a unit of Institute Diversity.

In addition, this year's Focus program participants represented 78 colleges and universities from approximately 25 states and U.S. territories.

"Before Focus, I had no idea that there was such



» President Peterson greets Focus 2016 participants.

a welcoming place for me in the United States," said Morolake Omoya, an undergraduate student at UCLA. "Georgia Tech has always been my dream graduate school, and I am thankful to all the organizers of this program for opening my eyes to a bright future."

The four-day program includes campus and city tours; department and lab visits; panel discussions on student and alumni topics; and the President's Dinner.





## Athletic Teams Post Impressive 'Report Card'

Each of Georgia Tech's 15 athletics programs is in good academic standing, while three teams led the Atlantic Coast Conference, according to the latest Academic Progress Rate statistics released by the NCAA.

This latest NCAA APR report is based on scores from the 2011-12, 2012-13, 2013-14, and 2014-15 academic years.

An impressive 13 of Georgia Tech's 17 teams scored 980 or better out of a possible 1,000 points, while 12 teams posted either identical or better scores from the previous APR release — baseball, men's cross country, women's cross country, football, golf, men's swimming and diving, women's swimming and diving, men's tennis, women's tennis, men's track, women's track, and volleyball.

Golf (1000), men's swimming and diving (1000), and volleyball (1000) are all tied for the top multiyear APR score in the ACC, while football (987) has the second-highest APR among ACC football programs. Softball (989) and women's swimming and diving (995) are tied for the third-highest scores in the ACC.

In addition, four Yellow Jacket teams were publicly honored for being among the top 10 percent in APR. Football, golf, men's swimming and diving, and volleyball each received APR Public Recognition. The golf program has received an APR Public Recognition Award every year since the APR's inception in 2006.



## Admissions, Retention, and Graduation Rates Set Records

Applications for fall 2016 undergraduate admission hit a record high of 30,520 — a 12 percent increase over the previous year. Of that number, 26 percent were offered admission (between early action and regular decision rounds).

The academic profile of accepted students continues to be more impressive each year. This year, the average SAT is 1445 (out of 1600), with 10 college-level courses completed.

In addition, the Institute's first-year retention rate rose to 97 percent, which is a record for the Institute and strengthens Tech's position among the nation's most elite universities. This figure measures the percentage of a college's first-time freshmen who return the following year. The national retention rate average for public four-year universities is 80 percent.

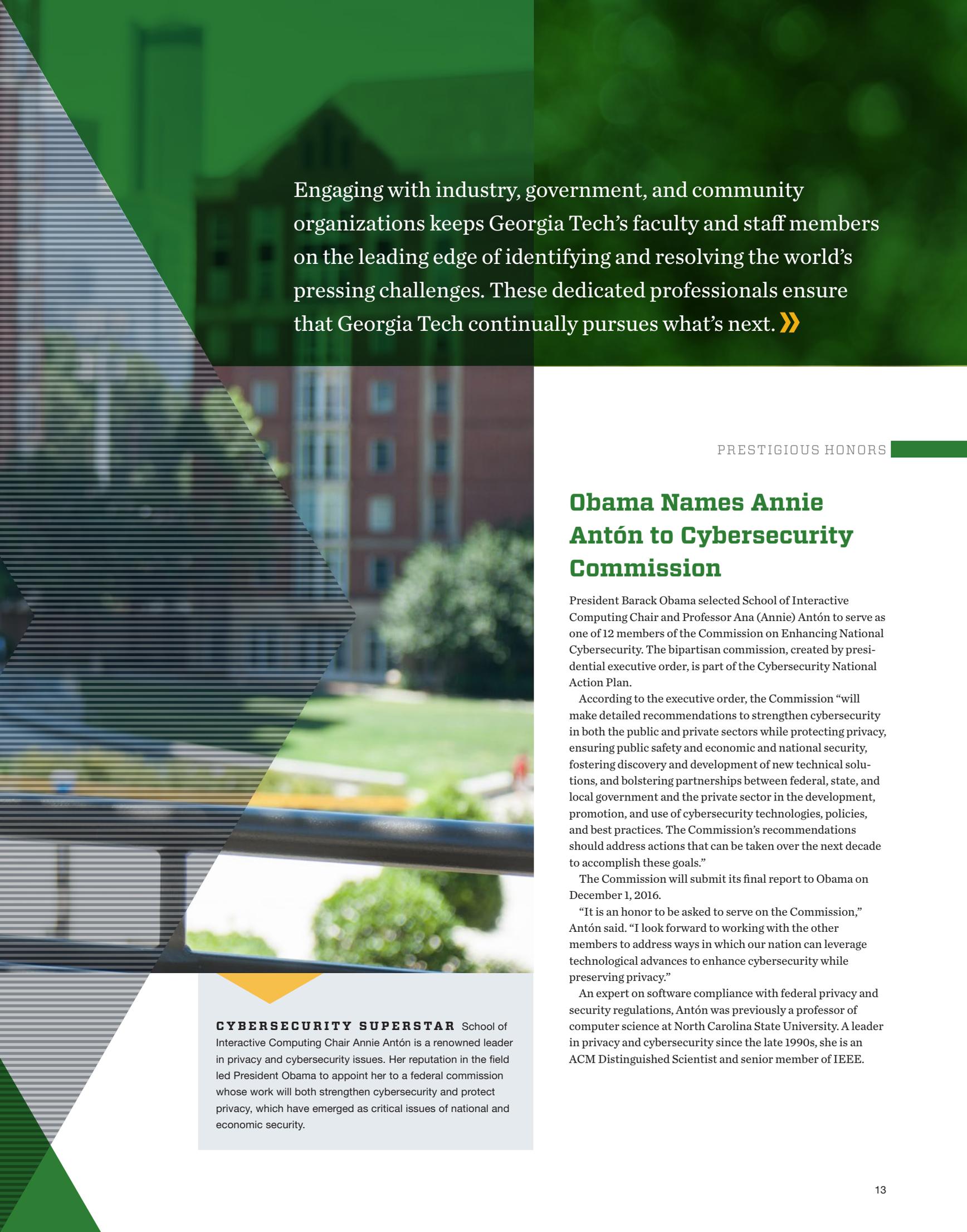
Georgia Tech also set new records in graduation rates. The Institute's five-year graduation rate rose to 80 percent, while the six-year figure climbed to 85 percent. That compares to national averages of 55 percent and 59 percent, respectively, according to the National Center for Education Statistics.

"It takes an entire campus community to achieve these high retention and graduation rates," said Steven Girardot, associate vice provost for Undergraduate Education. "I'm proud of the efforts of our faculty and administrators, who work very hard to support student success from the first day a student arrives on campus until the day they graduate."

» Recruiting and sustaining a diverse community of learners is among Georgia Tech's highest strategic priorities.



CELEBRATING OUR  
WORLD-CLASS  
FACULTY  
AND STAFF



Engaging with industry, government, and community organizations keeps Georgia Tech's faculty and staff members on the leading edge of identifying and resolving the world's pressing challenges. These dedicated professionals ensure that Georgia Tech continually pursues what's next. >>

#### PRESTIGIOUS HONORS

## Obama Names Annie Antón to Cybersecurity Commission

President Barack Obama selected School of Interactive Computing Chair and Professor Ana (Annie) Antón to serve as one of 12 members of the Commission on Enhancing National Cybersecurity. The bipartisan commission, created by presidential executive order, is part of the Cybersecurity National Action Plan.

According to the executive order, the Commission "will make detailed recommendations to strengthen cybersecurity in both the public and private sectors while protecting privacy, ensuring public safety and economic and national security, fostering discovery and development of new technical solutions, and bolstering partnerships between federal, state, and local government and the private sector in the development, promotion, and use of cybersecurity technologies, policies, and best practices. The Commission's recommendations should address actions that can be taken over the next decade to accomplish these goals."

The Commission will submit its final report to Obama on December 1, 2016.

"It is an honor to be asked to serve on the Commission," Antón said. "I look forward to working with the other members to address ways in which our nation can leverage technological advances to enhance cybersecurity while preserving privacy."

An expert on software compliance with federal privacy and security regulations, Antón was previously a professor of computer science at North Carolina State University. A leader in privacy and cybersecurity since the late 1990s, she is an ACM Distinguished Scientist and senior member of IEEE.

**CYBERSECURITY SUPERSTAR** School of Interactive Computing Chair Annie Antón is a renowned leader in privacy and cybersecurity issues. Her reputation in the field led President Obama to appoint her to a federal commission whose work will both strengthen cybersecurity and protect privacy, which have emerged as critical issues of national and economic security.



## **Crittenden Wins Clarke Prize in Water Sustainability/Treatment Technology**

The National Water Research Institute named John Crittenden winner of the 2015 Clarke Prize, citing his contributions to the sustainability of urban water resources. Crittenden is a professor of civil and environmental engineering, director of the Brook Byers Institute for Sustainable Systems, Hightower Chair, and Georgia Research Alliance Eminent Scholar in Environmental Technologies.

“I was extremely happy and honored to receive the 2015 Clarke Prize in recognition for our work in water research and to join the ranks of such an outstanding class of former laureates,” Crittenden said. “I consider the Clarke Prize to be one of the greatest honors that one who conducts water research can receive.”

The award is one of only a handful of worldwide prizes for scholarly and practical achievements in water research.



## National Academy of Inventors Names Rohatgi as Fellow

Ajeet Rohatgi, Regents Professor and John H. Weitnauer Jr. Chair in the School of Electrical and Computer Engineering, was named a Fellow of the National Academy of Inventors (NAI).

Election to NAI Fellow status is a high professional distinction accorded to academic inventors who have demonstrated a prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development, and the welfare of society.

The 2015 Fellows account for more than 5,300 issued U.S. patents, bringing the collective patents held by all NAI Fellows to more than 20,000.

After joining the ECE faculty in 1985, Rohatgi initiated a program in photovoltaics that has become one of the best in the country. An internationally recognized leader in photovoltaics, Rohatgi is the founding director of the first university-based U.S. Department of Energy Center of Excellence in Photovoltaic Research and Education. He is the author of more than 400 publications and holds 16 U.S. patents.

Rohatgi has received numerous awards and distinctions from professional societies and Georgia Tech. He is also the founder and CTO of Suniva, a leader in the research, development, and manufacturing of high-efficiency, low-cost crystalline silicon cells.



AJEET ROHATGI

## Faculty Honored through Fellow Appointments

Georgia Tech faculty from across campus were named Fellows of various prestigious associations during the 2015-16 academic year:

### American Institute of Aeronautics and Astronautics (AIAA)

- John-Paul Clarke (Aerospace Engineering)
- Marilyn J. Smith (Aerospace Engineering)

### American Association for the Advancement of Science (AAAS)

- Yury Chernoff (Biology)
- Christoph J. Fahrni (Chemistry and Biochemistry)
- Jean Lynch-Stieglitz (Earth and Atmospheric Sciences)
- Philip Shapira (Public Policy)
- Marie Thursby (Scheller College of Business)
- Paul H. Wine (Chemistry and Biochemistry)

### Institute of Electrical and Electronics Engineers (IEEE)

- Faramarz Fekri (Electrical and Computer Engineering)
- Xiaoli Ma (Electrical and Computer Engineering)
- Calton Pu (Computer Science)
- Karsten Schwan (Computer Science) \*awarded posthumously

**WATER WONDER** Professor John Crittenden was honored with the Clarke Prize, which recognizes research accomplishments that solve real-world water problems and highlights the importance and need to continue funding related research. Crittenden was selected as the 2015 recipient because of his outstanding contributions to treating chemical contaminants in water and his leadership in addressing water demand for transportation, energy production, and domestic use in a holistic, sustainable manner.



## El-Sayed Wins 2016 Priestley Medal

For nearly 60 years, Mostafa A. El-Sayed, Regents Professor and Julius Brown Chair in the School of Chemistry and Biochemistry, has conducted highly acclaimed chemistry research and served as a chemistry educator and journal editor. In recognition of his decades-long contributions to chemistry, El-Sayed was awarded the Priestley Medal, the highest honor accorded by the American Chemical Society.

Director of Georgia Tech's Laser Dynamics Laboratory, El-Sayed began his independent research career in 1961 at the University of California, Los Angeles, before coming to Georgia Tech more than 20 years ago. These two periods have been marked by distinguished contributions to two diverse but important areas of research: molecular electronic energy relaxation and the science and technology of nanoscale objects. Over the past several years, El-Sayed has managed to knit these topics together, pioneering the biological application of nanoplasmonic phenomena and materials.

Among many other honors, El-Sayed was awarded the National Medal of Science in 2007, and he continues to serve on the president's National Medal of Science Selection Committee. He is an elected member of the U.S. National Academy of Sciences as well as a Fellow of the American Association for the Advancement of Science.

At Georgia Tech, he has anchored the continued development of an internationally renowned physical chemistry division while embodying the Institute's dedication to interdisciplinary science and technology.

## Former Fortune 50 CEOs Join Scheller College Faculty

The former CEOs of Fortune 50 companies The Home Depot and Walmart are now affiliated with the Scheller College of Business. Frank Blake, former chairman and CEO of The Home Depot, and Mike Duke, former president and CEO of Wal-Mart Stores Inc., are serving as distinguished executives in residence. They are working with Scheller College Dean Maryam Alavi on strategic initiatives and strengthening partnerships with the local and national business communities.

"Georgia Tech and the Scheller College are tremendous assets for Atlanta and Georgia," Blake said. "Dean Alavi has an engaging vision for the role Scheller College can play locally, nationally, and internationally. She brings a focus on the future role of technology in business that fits well with Georgia Tech's strengths and the community's needs."

"It is a great honor to be affiliated with the Scheller College, and I accepted this offer because of my love of Georgia Tech and the opportunity for the College of Business to make such a difference in the lives of the students," said Duke, a Tech alumnus. "I want to impact the lives of students so they can have an outstanding future in whatever they pursue." In doing so, he wants to help Georgia Tech "to be recognized as producing the best business leaders in the world."

## Prominent Military Leaders Join International Affairs Faculty

The Institute's depth of expertise in security-related strategy, policy, and leadership took a giant step forward last year with the addition of two renowned military leaders: Admiral James "Sandy" Winnefeld, former vice chairman of the Joint Chiefs of Staff, and General Philip Breedlove, former NATO Supreme Allied Commander in Europe.

Newly minted Distinguished Professors in the Sam Nunn School of International Affairs in the Ivan Allen College of Liberal Arts, both men are not only undergraduate alumni of Georgia Tech, but they were also Pi Kappa Alpha fraternity brothers during their time here.

A 1978 aerospace engineering alumnus, Winnefeld is working with Tech faculty, researchers, and students on a number of projects, classes, and presentations; he brings recent experience in the fields of strategy and policy, leadership, and defense investment to the Institute.

Breedlove, a 1977 civil engineering alumnus, works with faculty, staff, and students on security issues and policy. He brings a wealth of both deep and recent experience in the world's toughest security and policy issues as well as leadership in situations spanning both peace and conflict.

## Tech Wins Three USG Service Excellence Awards

The Chancellor's Service Excellence Awards recognize University System of Georgia employees for high levels of performance; highlight service projects and process improvements; and honor a commitment to customer service excellence. Georgia Tech staff members brought home three of the 2015 awards.



**Gold Service Excellence Leadership Award, Human Resources Associate Vice President Kim Harrington:** Harrington, who began her career at Tech in 2001 and previously served as director of the Student Center, was nominated for her leadership in both Human Resources and the Student Center.



**Silver Outstanding Process Improvement: Increase Service to Students Award, the VOICE initiative:** VOICE is a collaborative initiative of the Women's Resource Center, Greek Affairs, and Health Promotion focused on sexual violence prevention and education. The group has worked over the past year to broaden its reach to students, faculty, and staff by presenting at local conferences, initiating a peer education program for students, and developing an on-call victim advocate program to support students who have experienced sexual violence.



**Bronze Chancellor's Service Excellence Effectiveness and Efficiency Improvement Initiative Team Award, Adam Smith and the Compliance and Controls System Improvements Team:** Smith, an IT support professional, was nominated for his work with the Legal Affairs and Risk Management team in building new web tools and resources for the Compliance Partners Group, a new group of around 40 mid-level compliance partners on campus.



THE CHAPIN BUILDING

## Institute Cited for Outstanding Contributions to Campus Space

Georgia Tech administrators and facilities received four awards last fall at the University System of Georgia Board of Regents Facilities Conference.

**Steve Swant**, executive vice president for Administration and Finance, received the Cornerstone Award for his strong and passionate leadership qualities and ability to navigate the institution with enthusiasm and perseverance.

**Chuck Rhode**, vice president for the Office of Facilities Management,

received the Distinguished Service Award. Rhode has led the effort to restructure the Facilities department, resulting in economies, efficiencies, and best practices throughout the organization.

**The Chapin Building Rehabilitation Project** received the Sustainability Award. A renovation in 2014-15 restored the early character of the 1910 building by removing non-original walls and restoring the original historic fabric.

**Technology Square** received the Regents Award of Excellence for its embodiment of a "spirit of place" on the Georgia Tech campus.

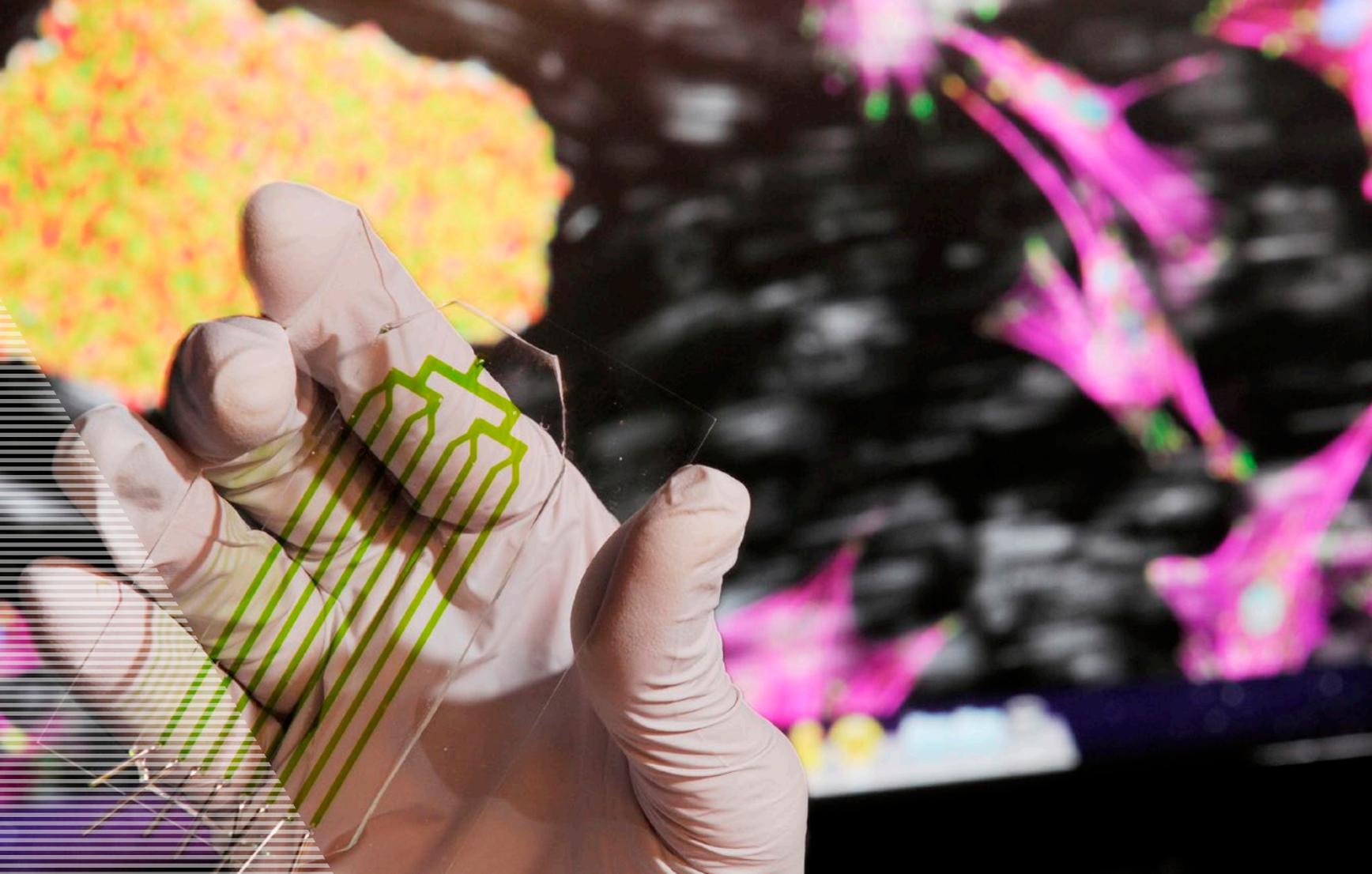


KRISHNENDU ROY



## MAKING AN IMPACT THROUGH RESEARCH

A research enterprise driven by a determination to improve human life while creating value and opportunity is a prominent element of Georgia Tech's culture. Our faculty and students use their renowned research expertise to create the next solutions for the world's toughest challenges. >>



HEALTH AND MEDICINE

## Marcus Center Advancing Cell-Based Therapies

A \$15.7 million grant from the Atlanta-based Marcus Foundation helped launch a new Georgia Tech research center that is developing processes and techniques for ensuring the consistent, low-cost, large-scale manufacture of high-quality living cells used in cell-based therapies. The therapies will be used for a variety of disorders such as cancer, lung fibrosis, autism, neuro-degenerative diseases, autoimmune disorders, and spinal-cord injury – as well as in regenerative medicine.

The work of the new Marcus Center for Therapeutic Cell Characterization and Manufacturing will help provide standardized production and quality testing for these living cells, which have great therapeutic potential. Standardized manufacturing techniques already exist for drug-based pharmaceuticals; the new center will help provide similar methods and standards for manufacturing therapeutic cells.

“The aspirin you buy today from one pharmacy is essentially the same as the aspirin you buy from another pharmacy, but cell-based therapies may have different efficacy depending on the source and manufacturing processes,” said Krishnendu Roy, Robert A. Milton Chair and professor in the Coulter Department of Biomedical Engineering. “There are established ways to quickly assess the efficacy and safety of small-molecule drugs that are acceptable around the world. We want to develop and establish similar processes for therapeutic cell manufacturing.”

### SETTING CELLULAR STANDARDS

The microfluidic device shown above exploits the differences in adhesion strength between derived stem cells and contaminating cell types in a heterogeneous culture to selectively isolate cells of interest using fluid shear forces. Georgia Tech researchers designed the technique to separate the cells. Far left, adult human fibroblast cells like these are converted to human-induced pluripotent stem cells through a reprogramming process during which restructuring of the adhesion proteins (shown in green) takes place.



» Thomas Barker (left) and Dwight Chambers (right) in the Barker Lab in the Engineered Biosystems Building (EBB).

## NIH Award Funds Pulmonary Fibrosis Research

A \$3.5-million, five-year Transformative Research Award from the National Institutes of Health (NIH) will support research into new approaches for tracking and treating pulmonary fibrosis, a disease that claims 40,000 lives per year.

The grant was made to Thomas Barker, an associate professor in the Coulter Department of Biomedical Engineering.

Pulmonary fibrosis is an incurable disease in which the uncontrolled growth of scar tissue severely damages the ability of the lungs to bring oxygen into the body. Researchers plan to hijack the cellular mechanisms that normally worsen the disease, causing them to instead produce a chemical compound that would reduce the cross-linking associated with the fibrosis.

“Fibrosis is wound healing that just won’t quit,” explained Barker. “Cells continually repair the same tissue over and over again until you get this dense, biophysically restricted scar tissue. That scar tissue not only impairs the ability to bring in oxygen, but at the cellular level that increased stiffness also provides a dominant signal that continues to drive this aberrant process.”

Barker wants to tap into the signaling that occurs between cells and their environment to co-opt the cellular response to stiffness of the extracellular matrix. Instead of creating more scar, the cells would respond by releasing a protease to dissolve some of the crosslinks that create the stiffness.

## Institute for Information Security & Privacy Established

In response to widespread and persistent cybersecurity threats to businesses, government, and individuals, Georgia Tech has formed a new interdisciplinary research collaborative — the Institute for Information Security & Privacy (IISP).

The IISP aligns the expertise of more than 460 researchers and nine labs across four colleges and the Georgia Tech Research Institute (GTRI) to form a single gateway to all cybersecurity efforts. Its purpose is to connect academia, industry, and government to seamlessly develop vital solutions for national security, economic continuity, and individual safety.

It is led by co-directors Bo Rotononi, a principal research engineer at GTRI, and Wenke Lee, a professor in the College of Computing and one of the world’s most prolific cybersecurity researchers. Associate directors include experts in law, business management, computing, and defense.

“Under the IISP, we expect to double our current cybersecurity research activity to move more research out to the marketplace, to develop new continuing education programs for professionals, and to broaden the cybersecurity curriculum so it is taught across more degree fields at Georgia Tech,” said Rotononi. “We want to be a catalyst for an information security industry in Georgia that is already attracting national attention and embolden it through joint research projects with companies of all sizes and critical government agencies.”

FRANCIS “BO” ROTOLONI AND WENKE LEE OF THE INSTITUTE FOR INFORMATION SECURITY & PRIVACY

## Grant Aims to Upgrade Data Transfer Security

Researchers from the College of Computing were awarded \$4.2 million from the Defense Advanced Research Projects Agency and the Air Force Research Laboratory to improve how data is tracked between computers, internet hosts, and browsers for better cybersecurity.

The four-year project, titled “THEIA” after the Greek goddess of shining light, attempts to shed light on exactly where data moves as it is routed from one internet host to another and whether any malicious code, for example, is attached to data during transfer.

“The project has wide implications for any industry and anyone who needs to send secure information, make sure it is not manipulated during transfer, and that it arrives securely intact — but especially for those banking, shopping, or trading online,” said Wenke Lee, primary investigator and professor in the College of Computing. “If we have the ability to fully track how data is processed until it reaches the intended recipient, then we can better detect and stop advanced persistent threats.”

THEIA will track and record information at three layers: user interaction with a program, program processing of data input, and program and network interactions with an operating system. THEIA will monitor secure data flow from user to program, from program to file system storage, and storage to network output, and back again.



» Physics faculty members Laura Cadonati (left) and Deirdre Shoemaker are key members of the LIGO Scientific Collaboration, which confirmed the first direct observation of gravitational waves in 2015. As chair of the LIGO Data Analysis Council, Cadonati coordinates and guides the work of hundreds of scientists around the world.

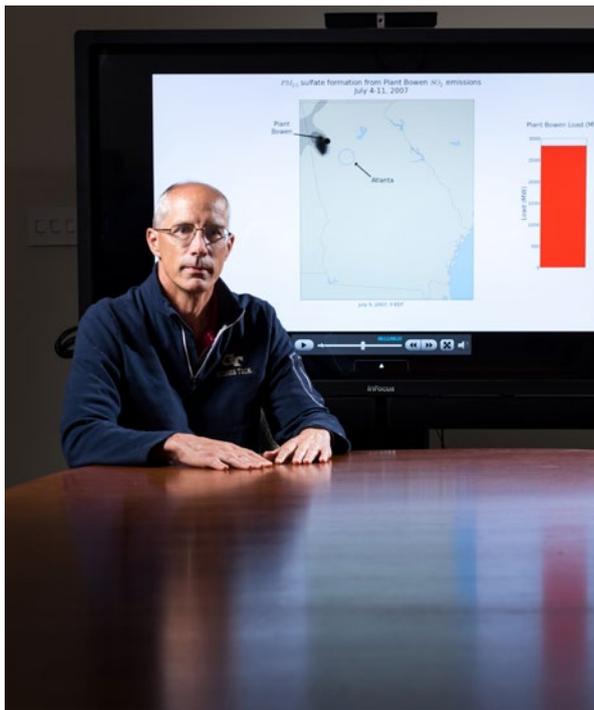
### Gravitational Waves Detected 100 Years after Einstein's Prediction

For the first time, scientists have observed ripples in the fabric of spacetime called gravitational waves, arriving at the Earth from a cataclysmic event in the distant universe. This confirms a major prediction of Albert Einstein's 1915 general theory of relativity and opens an unprecedented new window onto the cosmos.

Gravitational waves carry information about their dramatic origins and about the nature of gravity that cannot otherwise be obtained. Physicists have concluded that the detected gravitational waves were produced during the final fraction of a second of the merger of two black holes to produce a single, more massive spinning black hole. This collision of two black holes had been predicted but never observed.

The gravitational waves were detected in September 2015 by both of the twin Laser Interferometer Gravitational-wave Observatory (LIGO) detectors (located in Livingston, Louisiana, and Hanford, Washington). Twelve Georgia Tech faculty members, postdoctoral researchers, and students are members of the LIGO Scientific Collaboration. The team is led by Associate Professor of Physics Laura Cadonati, who also chairs the LIGO Data Analysis Council.

"This is a groundbreaking discovery that will open a new field of gravitational wave astronomy where gravitational waves will be a new probe to explore the mysteries of the universe," Cadonati said.



» Professor Ted Russell with an air quality prediction model showing how the impacts from generating plant emissions vary over time.

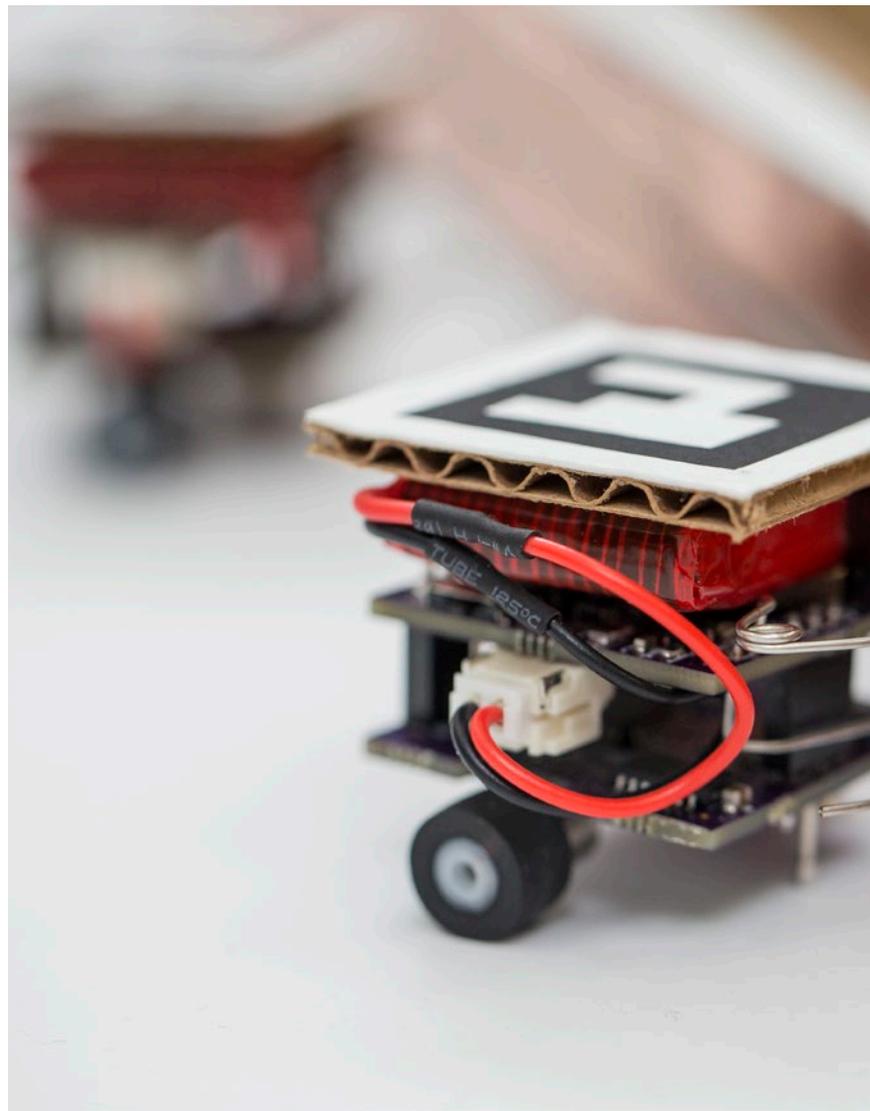
## NSF Research Network to Build Cities of the Future

A new National Science Foundation-funded research network is connecting scientists at nine universities with infrastructure groups, public policy experts, and industry partners to reimagine cities. Georgia Tech is an anchor of the \$12 million network, led by the University of Minnesota; Professor Ted Russell in Tech's School of Civil and Environmental Engineering serves as a co-director.

"We're bringing some very different communities together more than past projects have done," Russell said. "We are getting the engineering community, the health community, the atmospheric sciences community, the economics communities, and the policy communities in the same virtual room to look to the future. We're looking at real-life cities and figuring out how to make these cities work better and how to help cities evolve."

The research network will use cities across the United States (including Atlanta) and in India as "test beds" for its work, a unique approach that Russell said means the outcome of the network's studies will have significant impact. The project, called a Sustainability Research Network, will run for four years.

"Real success at the end of those four years would be one or more cities — having worked with us from the beginning — taking actions that will lead to improving the livability of their city," Russell said. "That could come in multiple ways: improved transit options, improved plans for water usage, effective urban farming, or strategies to improve air quality that they've actually implemented and to inform their citizenry of how to reduce their exposures to harmful chemicals and lead more healthy lives."



## Study Predicts Climate Change Sooner Than Expected



For the 70,000 residents of the Marshall Islands, global climate change isn't a theoretical concern with far-off potential consequences. The island nation is at no point more than six feet above the Pacific Ocean, and because sea levels are already rising, the nation's leaders have made plans to move to higher ground in Fiji.

Only immediate and aggressive efforts to mitigate the effects of climate change can head off accelerating near-term impacts such as those in the Marshall Islands,

argues a paper co-authored by an Ivan Allen College of Liberal Arts faculty member.

"Our argument is that if you want to do something, you'd better do something now because over time, you are going to lose the ability to have an impact," said Juan Moreno-Cruz, an assistant professor in the School of Economics. "If we delay action on climate change, the likelihood of doing something will be reduced because the damages will be accelerating. The incentives to address it are going to disappear as more damage occurs."

In addition to Moreno-Cruz, the paper's co-authors include researchers from Stanford University and the Potsdam Institute of Climate Impact Research.

"We have a relatively small window of opportunity in terms of economic incentives underlying the climate science," Moreno-Cruz said. "Once we pass a certain threshold, we won't be able to go back because we will lose the incentives to do so."

## ROBOTICS/ARTIFICIAL INTELLIGENCE

## New Robotarium Will Provide Remote Access to Robots

Georgia Tech is building a new lab that will allow roboticists from around the country to conduct experiments remotely. Researchers from other universities, as well as middle and high school students, will schedule experiments, upload their own programming code, watch the robots in real-time via streamed video feeds, and receive scientific data demonstrating the results.

The “robotarium” is expected to house up to 100 ground and aerial swarm robots. No other university has a similar facility.

“Building and maintaining a world-class, multi-robot lab is too expensive for a large number of roboticists and budding roboticists. This creates a steep barrier to entry into our field,” said Magnus Egerstedt, executive director of the Institute for Robotics and Intelligent Machines and Schlumberger Professor in the School of Electrical and Computer Engineering. “We need to provide more access to more people in order to continue creating robot-assisted technologies. The robotarium will allow that.”

Egerstedt will lead the project, which includes several Georgia Tech faculty members who will also have access to the facility for their own multidisciplinary experiments and curriculum. The team has already created a mini-version of the robotarium. Graduate students used it to complete their robotics projects. Researchers from the University of California, San Diego, successfully uploaded code during a test session.

The National Science Foundation is helping to fund the project with two grants totaling \$2.5 million. The robotarium is expected to be fully operational in 2017.



MAGNUS  
EGERSTEDT

» The Georgia Tech Robotarium collection includes GRITSBots like the one shown above. GRITSBots can move and interact with each other based on remote users’ commands.

## Using Stories to Teach Human Values to Robots

The rapid rise of artificial intelligence (AI) has raised fears about whether robots could act unethically or choose to harm humans. Some are calling for bans on robotics research; others are calling for more research to understand how AI might be constrained. But how can robots learn ethical behavior if there is no “user manual” for being human?

Researchers Mark Riedl and Brent Harrison in the School of Interactive Computing believe the answer lies in “Quixote,” which teaches “value alignment” to robots by training them to read stories, learn acceptable sequences of events, and understand successful ways to behave in human societies.

“The collected stories of different cultures teach children how to behave in socially acceptable ways with examples of proper and improper behavior in fables, novels, and other literature,” said Riedl, associate professor and director of the Entertainment Intelligence Lab. “We believe story comprehension in robots can eliminate psychotic-appearing behavior and reinforce choices that won’t harm humans and still achieve the intended purpose.”

Quixote is a technique for aligning an AI’s goals with human values by placing rewards on socially appropriate behavior. The Quixote technique works best for robots that have a limited purpose but need to interact with humans to achieve it, and it is a primitive first step toward general moral reasoning in AI, Riedl said.

“We believe that AI has to be enculturated to adopt the values of a particular society, and in doing so, it will strive to avoid unacceptable behavior.”

## Diamond Eye Provides Real-Time, Streaming Data Science

A new analytics framework might soon help businesses monitor massive amounts of data in a user-friendly way.

Developed by the Georgia Tech Research Institute (GTRI), Diamond Eye is a platform for one-stop data analytics. Before creating Diamond Eye, GTRI researchers had built a series of analytics tools for individual customers. But because they were developed for specific applications, these tools were not designed to be used beyond the original goals and customers.

Diamond Eye takes advantage of the expertise developed for these projects. The platform enables data ingestion, processing, and visualization in a single package, and is able to adapt to new data sources, new analytics, or new visualizations.

“Before Diamond Eye, it was difficult to share analytics because only the developer who had created it had the access or the know-how to use it,” said Amy Sharma, a research engineer at GTRI. “With this new framework, anyone can utilize the analytics and any developer can add new data, analytics, or visualizations.”

The system was designed to help users answer historical and real-time questions with their data. It can also provide situational and predictive results, using information about the past to help predict future conditions.



» Georgia Tech Research Institute (GTRI) researchers Amy Sharma and David Ediger, creators of Diamond Eye.



# PLANTING THE SEEDS OF ECONOMIC GROWTH

The results yielded from Georgia Tech's research enterprise serve as fuel to drive economic vitality — locally, nationally, and globally. The knowledge created by Tech faculty and students improves quality of life on a grand scale. >>





## Georgia Tech, Portman Launch Transformative Coda Project

Last spring Georgia Tech and Portman Holdings announced plans for Coda, an unprecedented collaborative building to be located in Tech Square that will include Georgia Tech's high performance computing center.

The approximately 750,000-square-foot, mixed-use project just south of the Scheller College of Business represents a \$375 million investment into the budding innovation district.

Within the development, 620,000 square feet will be devoted to office space designed to enable unparalleled collaboration between research and industry. Georgia Tech will occupy about half the office space. Nearly 40,000 square feet of retail space, including the adaptive reuse of the historic Crum & Forster building, will be accessed by a plaza, which will become a local gathering place and outdoor living room for Tech Square and Midtown Atlanta. The development also includes an approximately 80,000-square-foot data center, which Next Tier HD has been selected to operate.

"With Georgia Tech as the anchor tenant, the high performance computing center's interdisciplinary, collaborative environment will enhance Tech Square's positive impact in Midtown Atlanta, bringing together people in a mixed-use community of innovation, education, and intelligent exchange," said President G.P. "Bud" Peterson. "Over the past 13 years, Tech Square has become the Southeast's premier innovation neighborhood."

"The Portman team is honored to bring to life the vision for this mixed-use property at Tech Square, unlike anything else in the southeastern United States," said Ambrish Baisiwala, CEO of Portman Holdings. "We're excited to develop Coda — encompassing collaborative office space, co-working and research facilities, a high performance computing center, and interactive community space, collectively enhancing the innovation ecosystem created by Georgia Tech and Midtown."

Coda represents the next phase of Georgia Tech's Technology Square — Atlanta's most sought-after neighborhood for technology- and science-based companies. The new complex will be programmed around high performance computing modeling, simulation, and a sustainable innovation ecosystem that integrates the existing assets of Tech Square with new opportunities in interdisciplinary research, commercialization, and sustainability.

John Portman & Associates is designing the facility in order to achieve the primary goal of bringing research and commercialization together. The design includes the creation of an outdoor urban plaza bordered by retail and a giant interactive media wall, a high performance data center, and two office towers connected by a central collaborative core.

"We believe innovation is generated by looking at things in a different way," explained Pierluca Maffey, vice president of design for John Portman & Associates. "So we are creating spaces that allow brilliant thinkers, creative minds, and smart business people to come together, share their points of view, and start a process that leads to the next big idea."

**CULMINATING IN CODA** In only 13 years, Technology Square has blossomed into the Southeast's premier innovation ecosystem. The 750,000-square-foot Coda project on Spring Street will bring even more prestige and recognition to Tech Square, including the Institute's high performance computing center as well as office and retail space. (Image copyright © 2016 John Portman & Associates.)

## Tech Square Expansion Continues with New Innovation Centers

One of the world's top airline companies and a leading health benefits company opened innovation centers in Technology Square, and a major software firm announced plans to open a new facility in the rapidly growing innovation neighborhood.

### Delta Air Lines

Delta has invested \$2 million to build a collaborative research center, where it plans to enhance operations and improve customer experience by tapping into the knowledge at Georgia Tech. The Delta innovation center is a first for any American university.

"This facility is the first of its kind for the domestic aviation industry," said Gil West, executive vice president and chief operating officer at Delta. "Tapping into the bright minds at Georgia Tech is an opportunity to gain new perspectives and approaches across Delta for changes that will advance our business now and for years to come."

Inside the space, Georgia Tech students will have the opportunity to improve Delta's day-to-day business operations as well as the customer experience.

### Anthem Inc.

As the first Fortune 50 health benefits company with an innovation center in Tech Square, Anthem will be able to tap into Georgia Tech's existing research and technology, cultivate strategic relationships, and develop opportunities for collaborating with other technology and innovation companies in the area.

The Anthem studio is a state-of-the-art facility housing a multidisciplinary team who will focus on creating new capabilities to enhance the consumer health care experience, improve the quality of care, and lower health care costs. The 6,500-square-foot facility will foster innovation by providing a collaborative environment that brings together industry leaders and technology experts.



### STARTUP MAGNET

Tech Square connects the intellectual capital of Georgia Tech with the thriving business community in Midtown Atlanta. The eight-block Tech Square campus will soon total 3 million square feet of commercial space and more than \$1 billion invested.

"Innovation in health care is a priority for Anthem. By accelerating the development and implementation of new technologies, we'll deliver a superior, more personalized health care experience for consumers," said Tom Miller, Anthem's senior vice president and chief information officer. "We have created a dynamic ecosystem to generate ideas and launch them into the initiatives, solutions, and programs that can help transform health care."

### Keysight Technologies

Announcing plans to open an innovation center in Tech Square last spring was Keysight Technologies, a leading provider of electronic design and test software, equipment, and services.



» The Biltmore opened in 1924 and served as the cultural and social center of Atlanta for decades. The Georgia Tech Foundation has reached an agreement to purchase the historic building, which sits across the street from Technology Square.

### Georgia Tech Foundation to Acquire Historic Biltmore

In the summer of 2016 the Georgia Tech Foundation announced that it had reached an agreement with an affiliate of Novare Group to purchase the historic Biltmore building on West Peachtree Street — across the street from Technology Square.

“The Biltmore is already a vibrant component of what the Georgia Tech Foundation, the Institute, and its partners have previously built in creating the innovation neighborhood of Technology Square,” said Gary T. Jones, chairman of the Georgia Tech Foundation. “This simply strengthens what is one of the country’s most energetic technology ecosystems and is a wonderful example of the connections and collaborations between startups and business leaders and Georgia Tech faculty, students, and researchers.”

“For many years, the Biltmore has served as the historic anchor of Midtown Atlanta,” said President G.P. “Bud” Peterson. “We are proud to be able to incorporate it as a part of Georgia Tech. The acquisition of the Biltmore, combined with the state’s generous support of our business incubator program, the Advanced Technology Development Center, positions Georgia Tech to further expand the number of companies we serve. We look forward to integrating this iconic structure into our growing entrepreneurial ecosystem, where it will help us accommodate additional innovation centers and startups.”

The project is expected to create more than 200 software engineering jobs.

“We are excited by the opportunities and innovation that our new software development center will generate,” said Keysight President and CEO Ron Nersesian. “Georgia Tech has one of the best engineering programs in the country, and its students bring with them skills and capabilities that will be a great asset to Keysight. We believe that the education, inquisitiveness, and enthusiasm of this new team, under Keysight leadership, will incubate ideas and solutions that will fuel a wide range of next-generation technology innovations.”

Delta, Anthem, and Keysight join more than a dozen renowned companies that have opened innovation centers at Tech Square since 2011. (Emerson, UCB, and Honeywell announced plans for innovation centers in early FY 2017.)

Tech Square connects the intellectual capital of Georgia Tech with the thriving business community in Midtown Atlanta. It is a magnet for tech startups and university spinoffs. The eight-block Tech Square campus will soon total 3 million square feet of commercial space and more than \$1 billion invested.

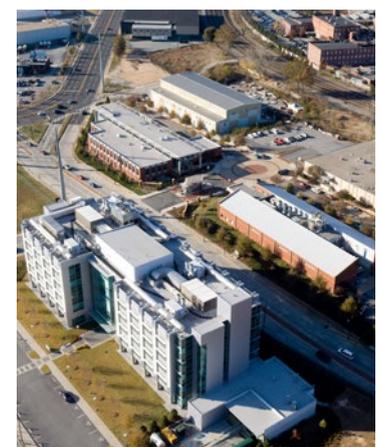
### Technology Enterprise Park Looking to Grow

Plans to transform the 11-acre Technology Enterprise Park (TEP) on the west side of campus into a \$500 million mixed-use, industry-focused hub took a significant step forward last year when the City of Atlanta awarded Georgia Tech \$100,000 to conduct a feasibility study.

The new funding augments a \$460,000 federal grant previously received for the study.

The expanded development will initially encompass about 60 acres and include a cluster of Georgia Tech research buildings on North Avenue and some adjacent properties. Possibilities for expansion beyond this initial stage would see the TEP innovation district extending south beyond the Georgia World Congress Center and including the area immediately surrounding the new Atlanta Falcons stadium.

TEP currently provides 173,000 square feet of multitenant laboratory space in two buildings. The feasibility study will help determine project costs, types of mixed-use activities, and how the development might be integrated into the surrounding area. The University Financing Foundation, Invest Atlanta, and the Atlanta Housing Authority served as partners to Georgia Tech in developing the grant proposal.



» Early-stage planning is underway to grow the 11-acre Technology Enterprise Park west of campus into an expanded \$500-million mixed-use, industry-focused hub.

» Teams from The Kendeda Fund and its project partners are in the process of analyzing and discussing site evaluations, design considerations, and technologies needed to achieve Living Building Challenge 3.0 certification.



## Living Building Challenge Team Selected

Georgia Tech selected the team of Lord Aeck Sargent and The Miller Hull Partnership to design the Institute's Living Building Challenge 3.0 project. The final team was selected after three teams participated in an ideas competition to explore all the possibilities and challenges of designing this certified project, set to be constructed on the Tech campus beginning in 2017.

The Living Building at Georgia Tech is a partnership between The Kendeda Fund and the Institute to build what is expected to become the most environmentally advanced education and research building ever constructed in the Southeast. The Living Building Challenge project will require a great deal of collaboration and the ability to embrace the process all the way through occupation and certification.

"Georgia Tech is where I first learned to love architecture as an undergraduate student, so the opportunity to be involved with a project as transformative as this is really an honor," said Joseph Greco, president of Lord Aeck Sargent and a College of Design alumnus. "We've always prioritized sustainable design, but the opportunity to help design and construct a Living Building Challenge 3.0-certified building takes our firm's abilities to do regenerative design to a new level — one that is grounded in the Southeast but also influential around the world."

"Our team is honored to work with Georgia Tech and The Kendeda Fund to realize the first Living Building in the southeastern United States," said Brian Court, partner, The Miller Hull Partnership. "We are excited to join Lord Aeck Sargent and other project partners to leverage Georgia Tech's research and academic resources in developing a transformative building that models a way toward a more balanced and sustainable built environment."

## Startup Pipeline Continues at Capstone

As his startup prepared to launch its second product, Partha Unnava turned to Georgia Tech students to help develop an improved medical walking boot.

Unnava's company, Better Walk, sponsored a team at last year's Capstone Design Expo, which showcases senior projects that aim to solve industry problems, develop innovative research tools, or launch entrepreneurial ideas.

"I decided to sponsor a Capstone team because Georgia Tech students are the brightest," he said. "They are focused and hardworking."

Unnava should know; he used to be a Georgia Tech student. He withdrew from school to focus on launching Better Walk, which redesigned crutches to minimize underarm pain. The crutches were scheduled to be out in fall 2016. His second product — a redesigned walking cast — should be available within the next year, he said.

While many of the more than 100 Capstone projects reflect work to help industry leaders solve problems or find new ideas, last year's event included a couple of teams sponsored by young startups with strong Georgia Tech ties. This work continues the startup ecosystem Georgia Tech is creating to ensure that students graduate with a strong background in innovation and entrepreneurship.

**Monsieur**, a startup co-founded by Georgia Tech graduates, sponsored a Capstone team that created a "robotic bartender" that allows people to order custom drinks — from a selection of some 300 popular cocktails — at the swipe of a screen. Their Capstone team was charged with optimizing the expected profit of the menus according to forecasted demand and creating an inventory policy to minimize associated costs.

**Gimme Vending**, which was part of the inaugural class of Georgia Tech's Startup Summer program in 2014, sponsored a Capstone team to work on keyless entry to vending machines. It is designed to retrofit existing vending machines and replace the existing mechanical cylinder lock.



# ENGAGING WITH THE WORLD



Leadership in global education, research, and industry engagement is a hallmark of the Georgia Tech experience. Our students, faculty, and staff consistently view the work of creating what’s next through an international lens. »

## EDUCATIONAL OUTREACH

### Shenzhen Program Adds to Global Education Options

A new international initiative, the Georgia Tech-Shenzhen Master of Science in Electrical and Computer Engineering (ECE) degree program, allows students from all over the world to receive a high-quality education from Georgia Tech faculty, gain experiences studying and living in China, and interact with multinational companies in China.

The master’s degree offered in Shenzhen is identical to its counterpart at the Atlanta campus. Georgia Tech-Shenzhen is located inside the Shenzhen High Tech Industry Park, in close proximity to hundreds of high-tech companies, making it easy for students to gain internship experiences.

“An investment in cooperative education programs between the U.S. and China is an investment that pays dividends for all of us,” said Consul General Jennifer Galt of the U.S. Consulate General in Guangzhou, China. “These programs bridge language barriers, open lines of communication, and connect people in both immediate and lasting ways.”

“We thank Tianjin University for helping Georgia Tech launch this new initiative in Shenzhen,” said G. Tong Zhou, ECE professor and director of the Georgia Tech-Shenzhen program. “Having had bilateral summer programs with Georgia Tech since 2009, Tianjin University has been a generous supporter of Georgia Tech’s efforts in China and is an important partner.”

» Students pursuing a Master of Science in Electrical and Computer Engineering at Georgia Tech-Shenzhen gain valuable experiences studying and living in China, and interact with multinational companies.



EDUCATIONAL OUTREACH

### Tech Partners with edX to Offer Online Courses

Georgia Tech signed an agreement with edX, the nonprofit online learning destination, to offer Massive Open Online Courses (MOOCs) for learners around the world.

The first Georgia Tech class offered was Information and Communication Technology Accessibility, which addressed the importance of developing an inclusive workplace for employees and customers with disabilities.

Offering courses under the brand GTx, Georgia Tech joins a consortium of edX partners that has instructed more than 6 million learners since its inception. Additional Tech courses were slated to be announced by year's end. GTx will also explore credit programs on edX and innovative ways of making traditional Tech programs available to more learners.

"The student and classroom of the 21st century continue to evolve," said Provost Rafael L. Bras. "Higher education must prepare the learner not just for their first job after graduation, but also for their third or fourth. Our partnership with edX will allow Georgia Tech to reach traditional learners, as well as early- and mid-career professionals, in new and novel ways, creating lifelong learning opportunities befitting a successful and fulfilling career."

The Institute offered its first MOOC in 2012. Since then, more than 1 million students have enrolled in online courses.



### Helping Cuba Access the World

A new Georgia Tech initiative called "Cuba Intercambio" is designed to help Cubans more freely access the internet.

As diplomatic relations improve between the United States and Cuba, researchers in the field of human-computer interaction are taking a hard look at the impact of internet access on the island nation, where information has been tightly controlled for more than 50 years. Understanding internet access in Cuba now is useful to researchers and corporations that may seek to engage more directly with Cuba for business, e-commerce, or tourism.

A study by the School of Interactive Computing revealed that censorship, high cost, and severely slow bandwidth keep Cuba residents from freely sharing information among themselves and with the outside world. "Cuba Intercambio" will provide island residents with an email-based method to submit online queries they cannot perform themselves to a team in Atlanta, which will manually search the internet for Cubans and email back their results.

"Cuba has been called the second most isolated place in the world," said lead researcher Michaelanne Dye, a Spanish speaker and second-generation American of Cuban descent. "Will Cuba at this historical moment be redefined by the internet in any meaningful sense, and what can we learn about their development that might help other low-access areas of the world?"

Dye's research partners are School Chair Annie Antón (also of Cuban descent) and Professor Amy Bruckman.



MICHAELANNE DYE



### Nuclear Instability Is Focus of Nunn School Grant

The Carnegie Corporation of New York awarded a grant to the Sam Nunn School of International Affairs in the Ivan Allen College of Liberal Arts to study how breakthrough technologies are increasing nuclear instability worldwide.

The grant focuses on a scenario-based examination of the dynamics of command, control, and coordination in cyber-conflict escalation. The principal investigators on the project include Professor Mike Salomone and Assistant Professor Jenna Jordan, who are supported by Ph.D. students Phil Baxter and Tarun Chaudhary.

The project team is exploring the phenomenon of escalation during a national response to a large-scale cyberattack. Cyberspace is a strategic venue with critical national security significance. The interdependence among organizations and command structures within the U.S. civil and military complex is being examined, particularly at the "seams" of the country's patchwork response. Best practices and lessons learned will be developed from scenario-based exercises applied to international contexts.



**TALKING TRADE** U.S. Secretary of Commerce Penny Pritzker (center) greets representatives from Georgia Tech at Hannover Messe 2016 in Hanover, Germany. The gathering — considered the world’s largest industrial technology event — provided an ideal opportunity to showcase Georgia Tech’s prowess in growing science, business, and technology for a variety of partners.

## Tech Participates in Hannover Messe Event

Representatives of Georgia Tech traveled to Hanover, Germany, last spring to participate in Hannover Messe 2016, considered the world’s largest industrial technology event. The Institute was part of the United States Pavilion in the Research and Technology trade fair.

“Georgia Tech is in the fortunate position of being one of a few global institutions continually called upon by universities, companies, and governments from around the world to assist in their efforts to grow science, business, and technology in an increasingly innovation-centric economy,” said President G.P. “Bud” Peterson. “We were proud to join the U.S. Department of Commerce’s SelectUSA initiative at Hannover Messe to highlight the many advantages the United States offers as a location for business and investment.”

Georgia Tech continues to be a leader in establishing global innovation portals and partnerships, research and education hubs, and select branch campuses such as Georgia Tech-Lorraine in Metz, France (which recently celebrated its 25th anniversary). The Institute showcased its global impact at Hannover Messe through the use of distance learning and other technologies that deliver educational and research products to students, researchers, governments, and businesses around the world.

## International Tech Companies Join New Research Center

AirWatch, AT&T, and Samsung Electronics constitute the inaugural group of founding members of the new Center for the Development and Application of Internet-of-Things Technologies (CDAIT) at Georgia Tech. The involvement of these companies reflects their continuing commitment to the advancement of the transformational capabilities of the Internet of Things (IoT).

“Internet of Things” refers to the ability for all types of devices to communicate with each other through networks like the internet, radio frequencies, and other forms of transmission. Devices could include the equipment in cars, homes, trucks, cargo, health care, and other everyday objects. This new area of technological innovation is receiving increasing attention around the world because of its potential impact on all sectors of the economy and society.

Together with Georgia Tech and the Georgia Tech Research Institute (GTRI), the founding members will closely monitor and actively participate in the expansion of the rapidly growing IoT industry.

“Having companies of this stature join Georgia Tech in this effort speaks volumes about what we’re trying to accomplish,” said Andrew Gerber, Georgia Tech senior vice president and director of GTRI. “We are proud to be recognized as a trusted collaborator in the Internet-of-Things arena. We are eager to harness the unique expertise of our professors, researchers, and students throughout the Internet-of-Things value chain.”

Housed at GTRI, CDAIT (pronounced sedate) is a global, nonprofit, partner-funded center that fosters interdisciplinary research and education while driving general awareness about the Internet of Things.



# STRENGTHENING COMMUNITIES

Georgia Tech students and faculty are renowned for developing innovative research and education initiatives that have a profound impact on communities. These impacts can be felt as far away as the other side of the globe or as close as our own backyard. »





» Marnie Harris (above, second from left), peer support program coordinator for Excel, talks with (from left) Faith Roman, Drew Schulman, and Tech student Thomas Welborn. “Tech prides itself on coming up with the next great thing,” said Harris of the Excel program. “People with disabilities have been left out of a lot of those conversations, but they have a lot to contribute.”

## ‘Excel’ Creates Unique College Opportunities

For many high school students, graduation usually leads to the possibility of college or other continued education at more than 7,000 colleges across the country. Students with intellectual and developmental disabilities, though, have a little more than 200 choices in comparison to their peers.

This year, Georgia Tech began offering a postsecondary academy for high school graduates with mild intellectual and developmental disabilities. The program, Excel, provides these students with a learning experience through which they can build on their education, life skills, and independence. Students who participate in the four-year program earn two certificates: one in social growth and academic enrichment, and a second that also incorporates career exploration.

“We’re creating college opportunities for students who have historically been shut out of the college experience, and it’s a game changer because we are doing it at Georgia Tech, one of the top 10-ranked public universities,” said Ken Surdin, director of Excel.

Around 2,000 students in Georgia high schools are eligible for this kind of program, but until Excel, there was only one



» Undergraduate Molly Hill (left) is one of many Tech students participating in Excel, a program designed to dramatically expand post-high school options for students such as Amara Hazzard (right).

program in the state, offering 15 spots a year. Excel has eight students this year and expects to enroll around 12 additional students per year, with a peak enrollment of around 48 students. The Excel curriculum includes traditional subjects such as reading comprehension, mathematics, and science, as well as life skills such as financial literacy, interpersonal communication, and community engagement.

“Tech prides itself on being innovative and coming up with the next great thing,” said Marnie Williams, peer support program coordinator for Excel. “People with disabilities have been left out of a lot of those conversations, but they have a lot to contribute.”

**‘EXCEL’ EXPANDING HORIZONS** The Excel program provides high school students who have mild intellectual and developmental disabilities with a learning experience through which they can build on their education, life skills, and independence.

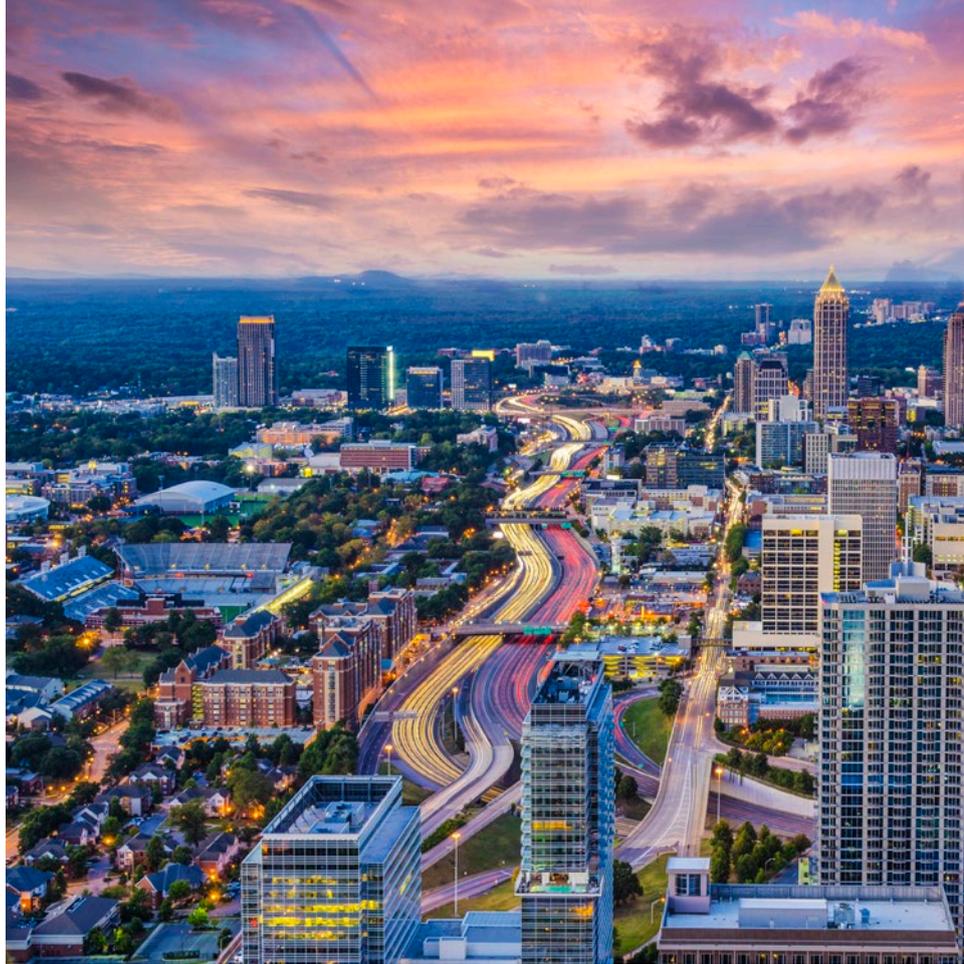
## Tech Partners with Atlanta and Georgia State in MetroLab Network

Georgia Tech, the City of Atlanta, and Georgia State University are founding members of the MetroLab Network. The goal of the forum is to research, develop, and deploy new technologies to address challenges in the nation's urban areas.

The MetroLab Network will provide members with the opportunity to share successes, address challenges, and build shared platforms for experimentation and data between cities and universities necessary to increase the tangible results of new innovations.

The MetroLab Network is based on previous successes of technologies developed from established city/university partnerships. These partnerships have produced innovative transportation and water infrastructure projects that have increased the efficiency and reduced the environmental impact of infrastructure systems.

"The City of Atlanta is proud to participate in the MetroLab Network," said Mayor Kasim Reed. "We look forward to leveraging this opportunity to take advantage of our strong university talent base and their extensive experience in technology, engineering, and computer science to develop innovative solutions to some of our most pressing infrastructure and service challenges."



"As an urban research university, Georgia State is deeply entrenched in Atlanta's success and in the success of cities around the world," said Georgia State President Mark Becker. "We welcome the opportunity to work closely with the City of Atlanta and Georgia Tech to find creative solutions to critical societal issues."

## People-Powered Photo Station Lands at Atlanta Airport

Travelers making their way through the atrium and selected concourses at Hartsfield-Jackson Atlanta International Airport were able to take a picture in a photo station powered by human motion.

The technical mechanism, called piezoelectricity, couples mechanical stress or vibrations to electrical energy (electricity). This clean, renewable energy-generation method is being developed for applications such as harnessing vehicle vibrations under roadways, foot traffic underneath walkways, and other wasted daily human movements.

The interactive system, dubbed People-Powered Photo Station, is the creation of a team of researchers from the Georgia Tech Research Institute (GTRI), the College of Design, and the Woodruff School of Mechanical Engineering, along with high school interns participating in Tech's Project ENGAGES (Engaging New Generations at Georgia Tech through Engineering and Science).

The photo station uses piezoelectric (PZ) material to generate energy. The PZ material is embedded in carpet tiles that form the system's floor, which is coupled to its camera. Attached is a series of 8-foot-tall acrylic cylinders that contain multicolored, programmable LED lights. The lights are programmed to respond to movement on the PZ carpet tiles. Once the tiles are activated, the cylinders will illuminate. The illumination will increase until enough light is available to take a photo, which can then be instantly shared on social media via the station's tablet interface.

"We were approached by Liza Milagro, senior sustainability



planner at the airport, and asked if we could utilize our developing technology to demonstrate the potential of harvesting energy through biomechanical motion in an approachable and entertaining method," said Ilan Stern, project director and GTRI research scientist. "We saw this as a great opportunity to share with the public some of the applications of this underutilized energy-harvesting method."

» Project participants include the Georgia Tech Research Institute (GTRI), College of Design, Woodruff School of Mechanical Engineering, high school students from B.E.S.T. Academy, and representatives from the Georgia Center of Innovation for Energy Technology, Hartsfield-Jackson Atlanta International Airport, Interface, and OMG Booth.



## Students Use Data Science to Solve Society’s Problems

Fires will happen. But what if the Atlanta Fire Rescue Department could determine which buildings are at greatest risk of fire and prioritize inspections to focus on those sites?

The fire department worked to do just that thanks to a summer internship program sponsored by Georgia Tech and Oracle. The city agency is one of four groups that participated in last year’s Data Science for Social Good (DSSG), where 14 undergraduate and graduate students showed nonprofits and government agencies how data can tackle societal problems.

“It’s important to get students involved in real-world projects,” said Christopher LeDantec, co-director of the program and an assistant professor of digital media in the School of Literature, Media, and Communication in the Ivan Allen College of Liberal Arts. “We are building out sustainable learning opportunities that allow students and Georgia Tech to have a wider impact in the community.”

The four students who worked with Atlanta Fire Rescue shadowed inspectors to learn not only how they work, but also how they create and use data. The students identified hundreds of additional commercial properties at high risk for fire that should be inspected with greater frequency.



» The Data Science for Social Good team presented their work to an audience of local data scientists, as well as fire-fighters, at the final summer presentation at General Assembly.

## CAMPUS IMPROVEMENTS

### Central Campus Landscaping, Infrastructure

**Tech Green:** The popular green space adjacent to Clough Commons was closed last winter for improvements to enhance the area’s soil and drainage system. System upgrades will help the field recover more quickly after heavy rains and intense use, ultimately resulting in more usable green space.

**Cherry Street:** A recent project refreshed vegetation, replaced materials, and restored quality to the landscaping and hard surfaces in the area to the west of Tech Tower. The Corliss pump that many are fond of photographing has a refreshed surrounding space that includes tables and chairs, benches, and bike racks.

**Atlantic Drive:** A significant section of steam pipes originally installed in the 1950s was replaced along Atlantic Drive. The pipes support several surrounding buildings and their heating and research needs. The project also improved the landscape and hardscape in the area to create a more pedestrian-friendly avenue in the middle of campus.



» The area around the Corliss pump — a popular photography subject on campus — has been upgraded with new tables and chairs, benches, and bike racks.

### Bicycle Master Plan Finalized

Four years ago, Georgia Tech was lauded by the League of American Cyclists as a silver-level Bicycle Friendly University — the only school on the East Coast to make the list. Since then, the Institute hasn’t just been coasting. Many infrastructure improvements have been made, including new bike lanes, additional racks, and even free, quick repair stations.

Now, a long-term next step has been completed with the finalization of Tech’s first Bicycle Master Plan. The plan will serve as a reference and guide to inform all campus projects going forward.

“The plan provides guidance, but it’s not prescriptive,” said Jason Gregory, senior educational facilities planner in Capital Planning and Space Management.

The Bicycle Master Plan began as an idea from Tech’s Bicycle Infrastructure Improvement Committee (BIIC), a group that includes students, faculty, and staff who work to make Tech a more bike-friendly place. When students brought the idea to Capital Planning and Space Management, they were happy to partner in the process.

Five key actions were determined during the planning process: make biking more visible on campus, improve access to campus, develop and support bike culture, establish dedicated funding, and identify and clarify partner roles.



# FOCUSING THE POWER OF PHILANTHROPY

The generosity of alumni and other friends plays a pivotal role in Georgia Tech's ongoing advancement into the ranks of the world's premier universities. >>



JOHN AND MARY BROCK

## Campaign Georgia Tech

The most successful fundraising campaign in Georgia Tech's history concluded on December 31, 2015. The generosity expressed by more than 90,000 donors has been invested strategically and — in concert with support from the State of Georgia — is working to strengthen and enrich Tech's student body, faculty, and facilities.

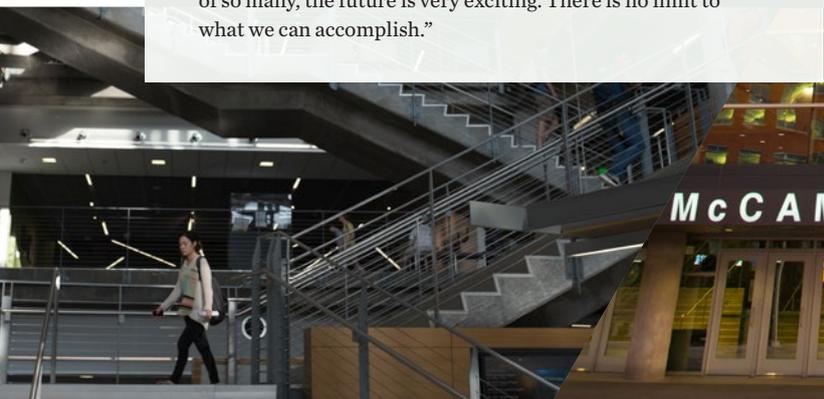
"We are humbled by the knowledge of the impact of Campaign Georgia Tech and what it will do for the Institute, and most importantly for the students and faculty," said Campaign Co-Chair John F. Brock III, a bachelor's and master's alumnus in chemical engineering. "It is an extraordinary success by any measure."

Not only did the Campaign exceed its \$1.5 billion goal by \$300 million, but it also succeeded in meeting — and surpassing — every major sub-goal.

"When we launched the public phase of the Campaign in 2010, just coming out of one of the most significant recessions in U.S. history, the Georgia Tech community responded in a way that we could have never imagined," said President G.P. "Bud" Peterson. "Because of this Campaign, and the support of so many, the future is very exciting. There is no limit to what we can accomplish."

### MAJOR FACILITIES CONSTRUCTED OR RENOVATED

- Brock Football Practice Facility
- Byers Tennis Complex
- Caddell Building (Building Construction, College of Design)
- Chandler Stadium (Baseball)
- Clough Undergraduate Learning Commons
- Engineered Biosystems Building
- Marcus Nanotechnology Building
- McAuley Aquatic Center
- McCamish Pavilion (Basketball)
- Noonan Golf Facility
- Zelnak Basketball Center





### Ernest Scheller Jr. College of Business

It is a rare event in university business education when a name is added to the ranks of the top public business schools. Joining the iconic brands of Ross, Haas, Darden, Kenan-Flagler, Anderson, Kelley, McCombs, Broad, and Carlson in 2012 was a new player: Scheller.

This seismic shift was the result of the vision and generosity of Roberta and Ernest “Ernie” Scheller Jr., a 1952 industrial management alumnus. Their gift of \$50 million established the Ernest Scheller Jr. College of Business among the nation’s most renowned business schools.

Scheller credits his Georgia Tech experience with developing his entrepreneurial edge and laying the foundation he needed for career success. “Georgia Tech taught me to be disciplined and focused in everything I did,” Scheller recalled. “I owe so much to Georgia Tech and the rigorous education I received, and I’ve always felt a tremendous amount of gratitude and a strong desire to give back to the Institute.”

The first half of the \$50 million gift was initiated in 2009 in the form of a \$20 million Scheller endowment challenge grant and a \$5 million expendable dean’s discretionary fund.

### H. Milton Stewart School of Industrial and Systems Engineering

In 2006, Carolyn and H. Milton Stewart, a 1961 industrial engineering alumnus, made a \$20 million commitment naming the H. Milton Stewart School of Industrial and Systems Engineering (ISyE). The commitment established a permanent endowment generating funds available for unrestricted use within the Stewart School.

The Stewarts’ philanthropy made ISyE the fourth named school within the College of Engineering, joining the George W. Woodruff School of Mechanical Engineering, the Daniel Guggenheim School of Aerospace Engineering, and the Wallace H. Coulter Department of Biomedical Engineering.

The Stewart School has been ranked No. 1 in the nation for 25 consecutive years.

“We’re honored to be a part of the ISyE success story that was written by so many alumni and faculty,” the Stewarts said. “Our outstanding faculty, bright students, excellent leadership, and highly supportive alumni give us an important edge in the continuing competition to be the very best.”



» The generosity of Milton and Carolyn Stewart has played a leading role in keeping Tech’s ISyE school No. 1 nationally for more than two decades.

## FACULTY SUPPORT

### Four Dean’s Chairs, Three Engineering School Chairs Established

From the beginning of Campaign Georgia Tech, one of the most important priorities was to increase the number of endowed chairs and professorships. With a goal of supporting 100 such positions, the Institute set out to strengthen an already extraordinary faculty by securing the resources that make it possible to recruit and retain the world’s best teacher-scholars and academic leaders.

#### Four Dean’s Chairs

- Stephen P. Zelnak Jr. Chair, Scheller College of Business
- John Portman Chair, College of Design
- Southern Company Chair, College of Engineering
- Betsy Middleton and John Clark Sutherland Chair, College of Sciences

#### Three College of Engineering School Chairs

- John F. Brock III School Chair, School of Chemical and Biomolecular Engineering
- Karen and John Huff School Chair, School of Civil and Environmental Engineering
- Anonymous, School of Materials Science and Engineering

## Stamps President's Scholars Program/ Stamps Leadership Scholars

In 2006, the Stamps Family Charitable Foundation — founded by alumnus E. Roe Stamps IV and his wife, Penny — launched the Stamps Leadership Scholars program inside the President's Scholarship Program at Georgia Tech to support merit scholarships for the most promising undergraduate scholars from across the nation. Annual gifts provided by the Stamps Foundation are matched by the Institute, and the total funds provide the full cost of attendance and enrichment opportunities over four years for the 10 top freshmen admitted to Georgia Tech annually.

Earlier this year, the Stamps Foundation made a commitment to more than double its annual grant to ensure that every President's Scholar will have the same opportunities provided under the current Stamps Leadership Scholars program.

This means that every student in the President's Scholars Program — approximately 40 freshmen each year — will receive funding equal to the full cost of attendance for four years (including tuition, fees, books, full room and board, and a stipend for miscellaneous living expenses) plus a laptop and enrichment experiences such as outdoor leadership programs, research and internship opportunities, and at least one international experience, up to \$15,000 over four years.

In recognition of this new commitment, the President's Scholarship Program was renamed the Stamps President's Scholars Program.



### Georgia Tech Promise

In 2007, the Institute launched a scholarship program that was the first of its kind among the state's public universities — a program that would provide a debt-free Georgia Tech education to students whose only obstacle to success was a lack of financial resources.

The G. Wayne Clough Georgia Tech Promise Scholarship program is designed to fill a gap in the financial aid support system, assisting Georgia students whose families have an annual income of less than \$33,300.

The program surpassed its \$50 million Campaign goal. To date, 473 Tech Promise Scholars from 89 Georgia counties have graduated. Fundraising was accelerated by two separate dollar-for-dollar challenge grants along the way.

» Duane Carver, CompE 2010 (left), was the first Tech Promise Scholar to graduate. President Emeritus G. Wayne Clough (center) and former Campaign Georgia Tech Chair Alfred P. West Jr. played pivotal roles in launching the program in 2007.



» In recognition of Roe and Penny Stamps' increased support of Tech's most prestigious merit scholarship, the program was named the Stamps President's Scholars Program.

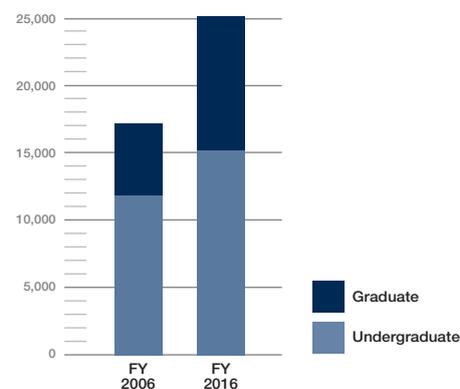
# ENROLLMENT AND DEGREES

## TOTAL HEADCOUNT ENROLLMENT

Enrollment	FY 2006	FY 2016	%Change
Undergraduate	11,841	15,142	28%
Graduate	5,294	9,892	87%
<b>Total</b>	<b>17,135</b>	<b>25,034</b>	<b>46%</b>
Full-time Equivalent (FTE) Enrollment	16,299	22,236	36%

## Comparison of Headcount Enrollment by Level

FY 2006 & FY 2016



## NEW DEGREES FROM 2006-2016

### Bachelor's

Applied Languages & Intercultural Studies  
 Biochemistry  
 Biology\*  
 Business Administration\*  
 Environmental Engineering  
 Literature, Media & Communication\*

### Master's

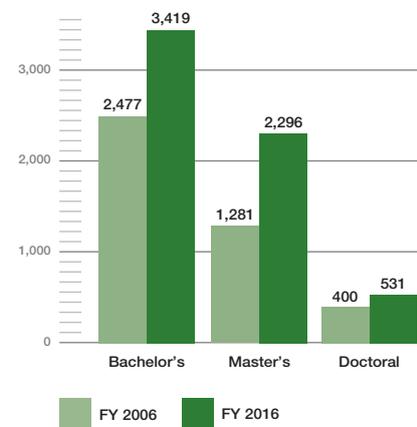
Analytics  
 Biology\*  
 Biomedical Innovation & Development  
 Business Administration\*  
 Computational Science & Engineering  
 Digital Media\*  
 Geographic Information Science & Technology  
 History & Sociology of Technology & Science\*  
 Mathematics\*  
 MBA-Global Business  
 Music Technology  
 Professional Applied Systems Engineering  
 Supply Chain Engineering  
 Urban Design

### Doctoral

Applied Physiology  
 Biology\*  
 Biomedical Engineering (Joint Emory/PKU)  
 Building Construction  
 City & Regional Planning  
 Computational Science & Engineering  
 Economics  
 History & Sociology of Technology & Science\*  
 International Affairs, Science & Technology  
 Music Technology  
 Operations Research  
 Polymer, Textile & Fiber Engineering\*  
 Robotics

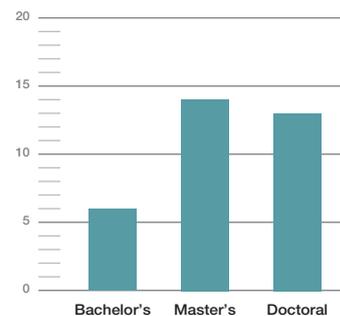
## Comparison of Degrees Awarded by Level

FY 2006 & FY 2016



## New Degree Programs

FY 2006 - 2016



\* Updated programs

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# CREATING THE NEXT<sup>®</sup>



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