

## **2013 Institute Address**

*On Aug. 29 Georgia Tech President G. P. "Bud" Peterson gave his annual institute address to faculty, staff, and students in Clough Commons on campus. The following is as written, not necessarily as presented.*

### **Welcome**

Good morning. To coincide with the start of a new academic year at Georgia Tech, each fall I provide an update to the campus community. It is part of our ongoing commitment to continuous communication with the Georgia Tech community. I'll provide an overview, and then we'll have time for questions and discussion. Today's presentation is being streamed live on the Web and will be posted as part of our ongoing communication efforts. By the way, this month you will notice a dramatic difference in the Georgia Tech website, which has been redesigned for ease and visibility, and also to accommodate smartphones and laptops.

### **Clough Commons and Library**

Two years ago we held the Institute address in Clough Commons during the first month it was open. It is hard to believe that for about half of our undergraduate students, it's as if Clough Commons has always been here. It was certainly adopted immediately. Clough Commons was designed to be open, flexible, and inviting for collaborative learning, a place for boundless resources in a common enterprise with the Library. That vision has become a reality. There were 2.4 million visits to Clough Commons in 2012. In just this past year alone it has been the site of almost 27,000 instructional hours.

Clough Commons was the site of some 200 events sponsored by a variety of student organizations over the past year. As part of Talks@Tech, Bill Gates engaged more than 600 Georgia Tech students, staff, and faculty members during a live videoconference session in November, complete with candid Q&A. This facility was also home to the Clough Art Crawl, which more than doubled in size this year.

If you count both Clough Commons and Library visits, that number grows to 3.6 million. We are re-envisioning our existing Library to create spaces for future innovation, innovative research, cross-disciplinary learning, and helping advance the learning, teaching, and research mission of Georgia Tech. Toward that goal, we are in the early stages of a Library Towers project.

We cannot move books out fast enough. Georgia Tech and Emory are building a joint storage facility which will preserve much of the Library's print collection. Once the project is complete, Tech students, staff, and faculty will have quick access to both the Georgia Tech and Emory book collections.

In addition, Georgia Tech faculty are uploading their work in the Library's SMARTech repository, which includes almost 40,000 scholarly materials, the vast majority of which are accessible to the entire world.

### **A Time of Positive Momentum**

We are experiencing a time of positive momentum for the Institute. Over the past five years: Student applications for the freshman class have increased by 70 percent, and enrollment has increased by 11 percent. We've experienced a 40 percent increase in research awards. We have a net increase of 70 tenured/tenure-track faculty. Sixty-seven young Georgia Tech faculty have been named NSF CAREER recipients. We were invited to join the Association of American Universities. We are making a regional, national, and global impact in numerous areas; we're increasing strategic partnerships and expanding the campus infrastructure.

We're experiencing increased national visibility. This past week alone a feature on Tech's new Online Master of Science in Computer Science appeared in the *New York Times*, and President Obama mentioned it in his speech on education. Nick Selby's sophomore welcome at Freshman Convocation went viral, with three million hits and national coverage from a dozen media outlets. We both appeared on Anderson Cooper 360 to talk about the importance of STEM education, and the Secretary of Commerce visited Georgia Tech.

### **SACS 10-Year Reaffirmation Process**

We are in the midst of our SACS 10-year reaffirmation process. I would like to thank Dean Catherine Murray-Rust for overseeing this extensive project, which involves two main components: compliance certification and a Quality Enhancement Program (QEP) for student learning. The QEP will build on the work we have already done as part of our strategic planning process. We are inviting interdisciplinary teams of faculty to submit concept papers that present a concrete idea on one of the themes that were identified in the strategic planning process directly relating to student education. More details will be available from the Office of the Provost. Our compliance report and associated data are due in September 2014; our Quality Enhancement Program is due that December. The onsite SACS visit will be March 2015. We anticipate that many faculty and staff will be engaged in the project, and I thank you in advance.

### **Freshman Class**

Earlier this month I welcomed almost 2,800 freshmen at Convocation in McCamish Pavilion. They were selected from almost 18,000 applicants. For the first time in Georgia Tech history, their average SAT tops 1400.

I shared some statistics with them that you might find interesting as well. Ninety-five percent of them will return as sophomores. I would like to thank those of you who have been working in various programs to continuously strengthen retention. It is working, and first-year retention is at an all-time high. Fifty-one percent will take a foreign language, even though it is not required. Thirty-five percent will participate in our cooperative education program, the largest voluntary program in the nation and one of the best. It gives students a wonderful opportunity to help pay college expenses and gain valuable on-the-job experience while in school. The six-year graduation rate has increased to 82 percent.

### **Strategic Plan**

Many of the hundreds of students who participated in the development of Georgia Tech's Strategic Plan starting in 2009 have graduated. We launched the planning process in conjunction with my Investiture, and more than 700 members of the Tech community participated in those first sessions.

This year marks my fifth Institute address, and the fourth since the launch in 2010 of Georgia Tech's 25-year plan, *Designing the Future*. The campus community came together and designed a plan with five overarching goals:

1. To be among the most highly respected technology-focused learning institutions in the world;
2. To sustain and enhance excellence in scholarship and research;
3. To ensure that innovation, entrepreneurship, and public service are fundamental characteristics of our graduates;
4. To expand our global footprint and influence to ensure that we are graduating good global citizens; and

5. To relentlessly pursue institutional effectiveness.

Since then, we have made solid progress in the implementation of each of these goals. Educational initiatives include new leadership programs and new teaching awards to recognize curriculum innovation, lab instruction, and co-curricular education. We are revitalizing undergraduate education with the X-degree, and service learning. We are realizing globalization of education through the vision of a global village in Tech Square, our global positioning strategy, and undergraduate admissions working with international alumni to pilot a global interviewing network. In our quest to become the “innovation institute,” we have had a dramatic increase in start-up creation, we offer more student-centered experiential opportunities in innovation, and have enhanced our industry outreach.

Initiatives to improve institutional effectiveness include the development of the Disabilities and Access Committee, the Mental Health Task Force, and the Family Friendly Task Force. The Family Friendly Task Force completed a climate assessment to identify areas of improvement to promote a healthy and productive work environment, and we are taking action on many of the recommendations. We’ve introduced online tools and systems for greater efficiency, including BuzzMart, TimeOut, and an application tracking system. Updates on other areas are posted on the Strategic Plan website.

### **Strategic Plan Advisory Group**

To help us further execute the Strategic Plan, we have created a Strategic Plan Advisory Group under the leadership of David Frost to provide advice and recommendations to Institute leadership on matters pertaining to the alignment, effectiveness, and impact of the Strategic Plan. Additionally, the group is providing a forum for discussing strategic issues and communicating progress to the campus.

### **Vision: What Does Georgia Tech Think?**

When we launched our Strategic Plan three years ago, we introduced an ambitious vision. While my initial thought was that “What does Georgia Tech think?” didn’t fit Tech’s style, I have come to realize that those five words summarize our potential impact. And not just our potential — for this past year alone we can point to numerous powerful examples of national leadership.

### **National Leadership**

Five Georgia Tech students were selected to be part of NASA’s 2013 class of Space Technology Research Fellows, making Tech the most widely represented institution in the program. Included among Georgia Tech students are Rhodes and Marshall scholars. Students are designing solar vehicles and new devices for heart surgery and pneumonia diagnosis. They are traveling across the world to design and install systems to provide clean water in small rural villages.

Henrik Christensen, one of America’s leading robotics researchers in our College of Computing presented a new roadmap for U.S. robotics to the Congressional Robotics Caucus. The roadmap highlights rapid advancements in the use of robots in manufacturing and health care, and assessed the potential impact that innovations in robotics will have on the American economy going forward. The work was produced by more than 160 experts from universities, industry, and government and was led by Georgia Tech. Georgia Tech researchers are developing the next generation of robots that will change the world, leveraging strengths and resources from the College of Computing, College of Engineering, and GTRI.

At Georgia Tech, we’re designing artificial platelets, allowing wounded soldiers to treat themselves on the battlefield using a device the size of an iPhone. We are making accurate

climate model projections. We are developing solar cells from trees. We are designing tablets for children with disabilities, enriching their lives.

We have made a first step with newly engineered biomaterials for cell transplantation that could help lead to a possible cure for Type 1 diabetes, which affects about three million Americans. Researchers from Georgia Tech and Children's Healthcare of Atlanta have developed a technique that assists in distinguishing tumors from normal brain tissue during surgery by staining tumor cells blue.

U.S. Air Force General Philip Breedlove, a 1977 Civil & Environmental Engineering alumnus, was selected earlier this year to head up NATO Forces in Europe. Georgia Tech alumni are leading some of the world's largest corporations and designing some of the world's most innovative buildings; they're serving in public office and serving meals at homeless shelters; they're sending robots to Mars and creating the virtual robot battles seen in summer blockbusters. They're giving a good name to Georgia Tech and giving back generously to their alma mater.

Georgia Tech had the best 30-year return on investment in higher education as reported by the *Wall Street Journal* in March.

### **Changing Expectations for Higher Education**

Expectations for higher education in the U.S. are changing. Today, American institutions of higher learning are expected to:

- Ensure that graduates are both employable and prepared to adapt and lead in an ever-changing world that many times requires an interdisciplinary approach to developing solutions to grand challenges.
- Move our research from the bench top to the consumer quickly to enhance economic development of the region and nation and create more jobs.
- Be global in nature and provide lifelong learning opportunities to people around the world using advanced technology.

While many institutions are scrambling to meet these expectations, Georgia Tech has a head start — of about 128 years! Georgia Tech was founded as a partnership with industry. Our graduates are in demand, innovation is entrenched in our culture, we are creating more new start-ups and jobs than ever before, and we serve a global community. Tech offers study abroad programs for all 35 undergraduate majors, and 43 percent of our undergraduates study abroad before graduation. Over the past two decades, the Georgia Institute of Technology has grown into one of the most globalized universities in the world, with partnerships in more than 30 countries and campuses and operations in France, Ireland, Costa Rica, Panama, and China.

### **Technology Assisted Learning**

One of the ways we reach people throughout the world is through Massive Open Online Courses, or MOOCs. While we had some very smart people working on Tech's strategic plan, nobody predicted the amazing rapidity with which "technology assisted instruction" would be adopted. This is a new arena for higher education, and Georgia Tech is one of the leaders. We started offering MOOCs one year ago, and so far, we have had more than 400,000 students in 14 courses.

Our Online Master of Science in Computer Science announcement in partnership with AT&T in May has received extensive national coverage, as well as interest from business and industry. It is the first professional Master of Science in Computer Science that can be earned completely

through the “massive online” format. The OMS CS could help address the nation’s growing shortage of qualified workers in STEM fields, which is one of the primary reasons AT&T decided to lend its financial support. It has the potential to double the number of trained computer professionals worldwide in as little as a decade. Courses related to the OMS CS will be available free of charge on the Udacity site, but only those students granted admission to Georgia Tech will receive credit.

Students studying on campus are benefitting from Georgia Tech’s MOOCS. Faculty who have taught MOOCs have returned from the experience saying that it improved their classroom teaching, and they are integrating MOOCS into their on-campus classes. For example, Tucker Balch will take components from his online computational investing class and use them in his machine learning course this semester, and Magnus Egerstedt is doing the same with robotics. Students studying on campus are gaining more opportunities for interaction in class due to flipped classrooms where they view the lectures online and come to class for discussion. We’re also exploring ways to use MOOCs to help students avoid the “bottleneck” that some experience as they near graduation. Some required courses not taught on campus that semester could be taken online.

Online education not only enhances a traditional college education, it also helps people participate in lifelong learning. Today, Georgia Tech’s Distance Learning offers 40 areas of study to students ages 16 to 85. Last year 17,000 individuals from more than 3,500 corporations and government organizations took part in Georgia Tech Professional Education (GTPE) programs. And they represented about half of the world’s countries. We are well on our way to transforming it to a global operation.

### **Technology Square**

Another way that we are making a major impact is through innovation and partnerships with business and industry. This year marks the 10<sup>th</sup> anniversary of Technology Square. Georgia Tech leaders exhibited great vision to join with the city and have the Tech campus jump the connector to create what is now becoming the foremost innovation zone in the Southeast. The energy continues to build, and it is becoming the place to be for start-ups and established companies alike.

### **Innovation Zone**

Two days ago I had the privilege of participating in the opening of the AT&T Foundry innovation center in Technology Square. Georgia Tech and AT&T share a common focus on innovation and already partner in a number of areas. Having an AT&T Foundry innovation center in Tech Square will create even greater opportunities for students and faculty while allowing AT&T to take full advantage of the resources at Tech and participate in the exciting growth of Midtown as an innovation district. Other large companies we are attracting include Panasonic with their Automotive Innovation Center, GM, and EY, formerly Ernst and Young.

We have taken numerous steps to enhance and expand the impact of commercial research at Tech, including the establishment of an Industry Task Force. This summer VentureLab was ranked No. 2 globally by University Business Incubator. We continue to help start-up companies be more successful through I-Corps, part of NSF, and programs like Flashpoint. In addition, we are experiencing growth in our North Avenue Research Area and Technology Enterprise Park.

Our expertise in helping new businesses get started has earned us global recognition. Our Advanced Technology Development Center, or ATDC, was ranked by *Forbes* magazine as one of 12 business incubators that are changing the world. A unit of EI<sup>2</sup>, ATDC has helped launch

more than 140 companies that, together, have created thousands of jobs and attracted more than \$2 billion in investment.

### **Student Innovation**

Students, faculty, and staff can now participate in TechStarter, the world's first peer-reviewed, university-based crowdfunding platform for science and engineering research projects. This is an example of Georgia Tech's out-of-the-box type thinking. It is particularly useful as a tool to generate seed funding. Since the system launched last spring, six projects have gone through the complete cycle. To find out more, go to their website.

Georgia Tech offers a growing number of opportunities for students to become engaged in innovation, including the InVenture Prize, Capstone Design Expos, Invention Studio, the Convergence Challenge, and the Smart Grid Challenge.

### **A Time of Positive Momentum: Campus Facilities**

Our campus is experiencing a time of positive momentum. The Zelnak Basketball Practice Facility, the Marcus Nanotechnology Building, the Brock Football Practice Facility, McCamish Pavilion, and the Ken Byers Tennis Complex are shining examples of the difference philanthropy makes on our campus. This fall we're dedicating the Carbon Neutral Energy Solutions lab, the site of collaborative research with industry and government and an example of sustainability.

By far the largest construction project on campus is the Engineered Biosystems Building, or EBB. This will extend Tech's vision for interdisciplinary research, addressing many of today's grand challenges in biomedical science and human health. Faculty have worked with architects to design EBB research space for the building that will be conducive to interdisciplinary collaboration. The new facility, combined with our faculty expertise, will help ensure that Georgia Tech is at the forefront of the convergent science revolution and will accelerate the pace of new discoveries and promote the commercialization of biotechnologies in Georgia.

A high performance computing facility in Tech Square has the potential to provide preeminence in the field of big data with major benefits to Atlanta as well as Georgia Tech. It can provide the infrastructure that high-tech start-up companies need, and significantly enhance economic development around Midtown Atlanta. We mentioned the Library Towers project earlier.

### **A Time of Positive Momentum: Renovations**

Major campus renovations include the Bradley Building, which now houses Highland Bakery and a conference room, the Mason Building, the Chapin Building, and the Caddell Building. We're modernizing our historic core, including Whitehead, the Library, and Tech Tower.

A number of other recent changes we've made to enhance the campus experience for the Tech community include a bike lane in Tech Square; the opening of a second facility for childcare and learning, Children's Campus@Tech; the smallest Walmart in the country; and four new on-campus dining facilities. It's hard to believe, but there were more than 3 million 800 thousand meals served on campus last year.

### **The Arts**

Enhancing our campus right now is an exciting 15-piece international sculpture exhibition on loan from various artists. It is called "Engineered Art" and is part of our Arts@Tech program. Arts@Tech includes events from big stage productions to small traveling exhibits; research with

everything from music technology to gaming to wearable computing; education combining artistic creativity with technical innovation; and community partnerships and initiatives. The Office of the Arts offers opportunities for students to engage with world-renowned artists in the exploration of science and technology through academic collaboration.

### **Reaching out to the Community**

The entire Georgia Tech community has an opportunity to partner with the Atlanta community through numerous programs such as France-Atlanta, in partnership with the Consulate General of France, and now Africa Atlanta 2014, a year-long series of activities spearheaded by Ivan Allen College Dean Jacqueline Royster. Dean Royster is also providing leadership for the Westside Communities Initiative, bringing together the many efforts that individuals and groups have made over the years to work with Tech's west side neighbors. One of those efforts is Project ENGAGE, where we partner with two high schools on the west side. Activities include Georgia Tech professors speaking in high school science classes and letting the students participate remotely in experiments in Tech labs through GTRI's D2D bandwidth videoconferencing system. Also, Georgia Tech students have provided tutoring and mentoring, and developed proposals to improve neighborhoods.

More than 1,600 Tech students, faculty, staff, and alumni volunteer every year for TEAM Buzz, Tech's largest community service event. Projects range from working in homeless shelters and soup kitchens to helping improve local parks. Tech works with local schools in numerous ways to help K-12 students with STEM fields.

### **Student Leadership Opportunities**

Georgia Tech offers a number of programs to help students grow and learn outside of the classroom, including more than 400 student organizations. Campus Recreation's Outdoor Recreation (ORGT) engaged more than 5,000 students in experiential learning opportunities last year, often on the other side of the world. ORGT introduced the "CORE Freshman Leadership Experience" — 10 months of trips, trainings, and speakers capped with a week-long student-planned expedition.

The Grand Challenges Living Learning Community is part of the Leadership Education and Development Program. In partnership with the College of Engineering, Grand Challenges provides students with an opportunity to work in cross-disciplinary teams to develop problem solving, analytical, and critical-thinking skills to find real solutions to real-world problems. This year, Grand Challenges students were awarded funding for 14 projects, including the design and implementation of a drip irrigation system for Burkina Faso, Africa, and a design for scalable solar photovoltaic cells ranging in application from personal device use to whole house use.

Leading Edge is the new leadership development experience for undergraduate students at Georgia Tech. Leading Edge participants will work with a Leadership Fellow, a master's or Ph.D. student trained to coach undergraduates, to intentionally explore and improve their leadership skills in specific areas.

### **Athletics**

Student athletes at Georgia Tech learn leadership skills while combining a rigorous academic curriculum with the demands of participating in one of 17 intercollegiate sports.

This past spring the football team held an International Football Clinic to teach American football to international students. The idea was spearheaded by the Student Government Association, in collaboration with the Athletics staff, student athletes, and the Office of International Education.

Earlier this month the women's basketball team had the opportunity to tour Europe, playing five games in 10 days in Barcelona, Paris, and London. Coach MaChelle Joseph said it provided educational opportunities as well. The trip was made possible through the generosity of Georgia Tech alumni and fans.

This summer the NCAA released their Academic Progress Report, or APR. Georgia Tech's APR scores have improved once again and are at a record high. Seven teams scored a perfect single-year APR of 1,000. These include golf, men's swimming, women's tennis, volleyball, men's indoor and outdoor track, and cross country. For the first time ever Georgia Tech football has been recognized as a Top 10 percent performer in APR among Division 1 schools.

### **Career Services**

Georgia Tech graduates are in demand, as exhibited by the number of on campus interviews, the increasing percentage of students who report job offers at graduation, and rising starting salaries. Seventy percent of spring 2013 bachelor's degree graduates reported having a job at graduation, up from 67 percent in spring 2012. Master's degree recipients are slightly higher, with 72 percent having a job at graduation, compared to 63 percent the year before. The average starting salary for bachelor's degrees is \$63,000, and \$65,000 for those in STEM fields.

### **Research Leadership**

Georgia Tech is known for its outstanding graduates, as well as for its research. At Georgia Tech we are developing a strong reputation for paying attention to the full life cycle of scientific and engineering research. We know that our excellent basic, fundamental or "discovery-based" research is the fuel for our research engine — without it we wouldn't be able to call ourselves a top research university.

To fully see the true impact this exciting work can have on society, we need to take these new discoveries and "apply" them to solve societal problems. Then we need to work hard to "deploy" them, or get them in the hands of government and industry so the world can benefit from our work.

In 2013 Georgia Tech had \$655 million in research expenditures. Included in that total is \$300 million for GTRI's contract efforts. We have an interdisciplinary, highly collaborative environment that permeates the entire university, and a successful history of partnering with business, industry, and government that sets Georgia Tech apart and contributes to an immensely successful track record.

### **Resources**

We are all aware that the federal budget — and sequestration — are putting pressure on the government agencies to cut back and refocus how they spend their research dollars. This means that there will be less government-sponsored research available for us to go after. At Georgia Tech, we've already seen a few of our government-funded research programs directly impacted by these cuts. The overall impact on us has not been dramatic yet. It may not even be dramatic next year, but it is possible that we could start feeling the full effect of sequestration in FY 2015.

We can't rely on the government to continue to fund research at the same levels as in the past, so this is why we have been talking so much about industry research. Now is the time for us to balance and diversify Georgia Tech's research portfolio.

One example of securing other sources of revenue is Georgia Tech-Savannah's new focus on education for business and industry to foster professional, economic, and workforce development. We are also continuing with our relentless pursuit of institutional effectiveness and implementing best business practices.

### **Campaign Georgia Tech**

Georgia Tech owes much of its legacy to the engagement and support of those who share the Institute's vision for the future and are committed to helping it achieve ever-increasing levels of excellence. Campaign Georgia Tech is allowing us to achieve a level of excellence not possible through state funding alone. We are at \$1.25 billion toward a \$1.5 billion goal by December 2015. Through Campaign Georgia Tech, we are able to increase endowed chairs and professorships. Much of our construction is made possible through philanthropy. And, we are able to provide academic as well as need-based scholarships. One example is the G. Wayne Clough Georgia Tech Promise Scholarship. Tech Promise offers a debt-free Georgia Tech education to academically qualified Georgia residents from low-income families. More than 200 students were enrolled in the program this past year, and almost 600 students have participated to date. Not only will their lives be changed, but the lives of generations to come.

### **Close**

Georgia Tech is about changing lives. We're curing diseases. We're revolutionizing manufacturing processes, designing global solutions, and developing and implementing breakthroughs in dozens of other areas. We're influencing thinking in science, technology, and policy. We're preparing the next generation of leaders and innovators. As we work together as One Georgia Tech, we are fulfilling our mission as leaders in improving the human condition in Georgia, the U.S., and around the globe. Thank you.