Function meets form in the work of Tech’s top alumni, faculty and student designers.
When it came time for Robert H. Ledbetter, ME 1964, to decide on a college, his uncle, Julian Head, CE 1950, persuaded him to choose Georgia Tech over Auburn. It was a decision that helped shape the engineer – and the individual – he became.

Ledbetter was born in Anniston, Alabama, and grew up in nearby Oxford. He graduated in the top 10 percent of his high school class but found Tech far more challenging. He had what he called “a very poor first quarter.” Through perseverance and hard work, however, he regained his academic footing and excelled.

After graduation, Ledbetter began his career with Boeing in Huntsville, Alabama, where he worked with NASA to design Saturn V ground support equipment as well as the lunar rover project utilized in the moon landings of the 1970s.

Bob and his wife, Anne, who were married in 1968, moved to Decatur, Alabama, where he joined Monsanto Chemical Company. Starting as a project engineer, progressing to an engineering supervisor, and ultimately serving as plant superintendent, Ledbetter spent over 27 years at what became the largest acrylic fiber plant in the world. Anne, a graduate of Birmingham-Southern College who holds a master’s degree in English, enjoyed a long career as a successful and much revered high school and college English instructor.

In 1995, Bob Ledbetter was part of a team of four scientists who received Monsanto’s Edgar M. Queeny Award for developing a new wet spinning process for manufacturing bicomponent acrylic yarn – a great honor for Ledbetter and his colleagues.

Today, the Ledbetters are retired and active in church and volunteer activities. They decided to focus their estate plans on philanthropic support for their respective alma maters, establishing academic scholarship funds through their Wills. “We want to promote educational opportunities for those who could not otherwise afford a college education,” said Ledbetter. Later, they increased their estate commitment to Tech, and Anne endowed a football scholarship at Georgia Tech in Bob’s name.

The Ledbetters have done much to support the academic and athletic pursuits of future generations of Tech students. This year, Bob Ledbetter is serving on his 50th Reunion committee, and encouraging classmates to celebrate Homecoming and to follow his and Anne’s lead by becoming members of the Founders’ Council.

“We want to promote educational opportunities for those who could not otherwise afford a college education.”

— Anne M. and Robert H. “Bob” Ledbetter, ME 1964, of Decatur, Alabama
I’M IN A NEW JOB I LOVE, AND I USE WHAT I LEARNED EVERY DAY—NOT JUST AT WORK, BUT THROUGHOUT MY LIFE.

The Georgia Tech Professional Master’s in Applied Systems Engineering offers a flexible, hybrid format with hands-on experience and online learning to help you solve real-world problems without interrupting your career. Download a brochure or view videos online.

Professional Master’s in Applied Systems Engineering (PMASE)
At Tech’s Game Studio, faculty and students explore the untapped possibilities of video games.
Students design urban apartments that produce as much energy as they consume.

Researchers deploy tiny treatments to target big cancer.

Justin O’Neal Miller, Arch 05, makes movie-set magic.

Aman Advani, IE 07, helps re-engineer business attire for high performance.

Corey Rockwell, IE 98, flags down his futbol dreams.

For much more than design’s sake
At Tech, Good Design Means Solving Problems

Design is pervasive in our lives. And it’s more than just planning—it’s the thoughtful and careful execution of those plans.

As we all know, good design isn’t just about how aesthetically pleasing something is. I know this first hand. I built a deck on my house years ago and I was so enamored with how the framework of the deck looked, I was reluctant to install the deck boards. Of course, without the deck boards, the framework had no utility. That’s not good design. (But perhaps it was art!)

In this issue, we’ll take a look at design in a wide variety of manifestations at Georgia Tech—from architecture to automobiles, from toys to medical devices—as developed by our alumni, faculty, researchers and students. As you’ll read, solving problems is at the heart of design, and it’s also at the heart of a Tech education, making the Institute a really good place to become a designer.

A simple word search on “design” on www.gatech.edu yielded 4,470 results in a tenth of one second. Georgia Tech has 10 Interdisciplinary Research Institutes (IRIs) composed of almost 400 centers and laboratories focused on problem-solving and design. According to the Office of the Executive Vice President for Research, “these IRIs exist to create transformative opportunities, strengthen collaborative partnerships, and maximize the societal impact of the exciting research being done at Georgia Tech.”

Harnessing the intellectual horsepower of some of the world’s smartest faculty, researchers and students will provide new discoveries and advancement to the world for decades to come. Out in the world, our alumni are leading the charge in design in almost every field you can imagine. They’re designing buildings, interactive websites, energy infrastructure, smart clothing, Ferraris, biomedical tools and processes, video games, humanitarian aids, new food sources from scratch and so much more. And, often, their work begins by trying to solve the world’s problems from a scientific or engineering point of view—truly a Tech thing.

By the time you receive this issue, the 2015 school year will be underway and a new batch of freshmen will be starting to, yes, design their futures. They’ll be learning the Georgia Tech way and trudging up Freshman Hill to the Clough Undergraduate Commons to study calculus, chemistry and the other core classes that will serve as the building blocks of their careers as problem solvers and designers.

As Cicero once said, if I had more time, I would have written a shorter letter. Now that would have been good design.

JOSEPH P. IRWIN, IM 80
PRESIDENT & CEO
GEORGIA TECH ALUMNI ASSOCIATION
PL AN A { Helluva } MEETING!

Georgia Tech Global Learning Center is the official meeting facility of the Georgia Tech Alumni Association.

Next time you’re planning a meeting or conference – think The Georgia Tech Global Learning Center. We’ve got meeting spaces, conference facilities, and connected classrooms – perfect for your company’s needs, with the Georgia Tech excellence you expect. Schedule your personal tour today.
I’m proud of the fact that I was a Georgia Tech and Navy ROTC graduate from a Georgia Tech military family, and in the same company with those active-duty service members and veterans you highlighted.”

Patrick W. Drennon, CE 62

A Big Salute for “The Military Issue”
I just received the recent Georgia Tech Alumni Magazine (Vol. 90, No. 2), aka. “The Military Issue,” and thoroughly enjoyed all the articles, especially the “Brave Faces” photo essay—Jim McGarrah was a shipmate and friend. I also enjoyed the amazing story and accomplishments of Gen. Philip Breedlove and Adm. Sandy Winnefield.

I congratulate the staff on an outstanding issue. I’m proud of the fact that I was a Georgia Tech and Navy ROTC graduate from a Georgia Tech military family, and in the same company with those active-duty service members and veterans you highlighted.

Patrick W. Drennon, CE 62
Rear Admiral, Civil Engineer Corps, U.S. Navy (Ret.)
Alexandria, Va.

I have a lot of respect for Tech ROTC, and was glad to read of how it stands today in the story “G.T. R.O.T.C. N.O.W.” (Vol. 90, No. 2). As the Army’s Outstanding Distinguished Military Student my senior year, a career as an infantry officer beckoned me. However, after a few years of active duty, I chose a different path.

What I remember best about ROTC was the healthy skepticism that many of my fellow students had toward authority and the use of military force. This skepticism was acted out each Thursday when the Army ROTC troops paraded around Peters Park. The Brigade staff, including the Brigade Commander, Cadet Colonel Bill Curry (yes, that Bill Curry) and myself, the Brigade Adjutant, a cadet Lt. Colonel, stood at attention as the troops passed. A fraternity brother of mine had invented a simple water balloon launcher that had quite a range. My friend discovered that if he stood at just the right spot on the roof of the frat house, balloons could be sent in a trajectory that gave no clue as to origin. Once we were bracketed, my friend would fire for effect. Water balloons would rain down upon us. We all had to work hard at not laughing out loud.

It was also good to read of Tech students reaching high places of responsibility in the military. My hunch is that within their professional military minds they know the limits to military power and that force is always the last option. My checkered career has included being a staff director for a U.S. representative of Congress. In meetings with Sam Nunn, another Techster, I can remember him always asking in response to a suggestion of military force, “Why are we doing this? What is the strategic reason?” Our nation needs that voice today.

Rev. Dr. Jim (Joe) Watkins, IM 65
Pawleys Island, S.C.

Civil War Beneath My Feet
I thoroughly enjoyed reading the historical article on the Confederate defenses in Atlanta in the latest issue (“Landscapes of War,” Vol 90. No. 2). In my junior year at Tech, in the early 1970s, I often made my way between the chemical engineering building and the student center between classes. Hemp-hill Avenue was being removed and construction was everywhere. While crossing the now blockaded street, I looked down to find a Union Minie ball in the dirt. It now sits in my den surrounded by other Civil War relics from Bull Run, Brandy Station and Winchester.

Hal Carson, ChE 73
Spartanburg, S.C.
“I returned to Georgia Tech for my MBA because of four key advantages:

1) a flexible program structure,
2) an incredibly smart and diverse student body,
3) a full range of extracurricular activities, and
4) a top-tier reputation.

No other college could compete. I’m proud to say that I’m a Ramblin’ Wreck...again.”

Terrence Byrd, MBA Candidate
Evening MBA Program
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BS, Chemical Engineering,
Georgia Tech

Learn more at: www.back2tech.com
Georgia Tech architecture students have embarked on a three-year project to design urban dwellings with net-zero energy impact (that is, they produce as much energy as they use). These 3D-printed models show off some of their early ideas. Read the story on the next page to learn more.
Take a walk around a home-improvement store, and you’ll see plenty of product tags advertising ways you can reduce spending on your utility bills—and your carbon footprint. But going green and saving a bit of money by using Energy Star appliances, smart thermostats or compact fluorescent light bulbs is just a drop in the proverbial bucket. What if your house or apartment could produce enough energy to balance out the amount it consumes?

It’s called net-zero energy design, and it’s a growing movement in architecture. A net-zero building is not only specially engineered to maximize energy savings, but also generates its own renewable energy—through methods such as solar panels—to cancel out the consumption of electricity and gas.

“It’s very easy to be energy efficient these days,” says Michael Gamble, M Arch 91, associate professor of architecture at Tech. “However, I would say there’s sort of an 80/20 rule. It’s the 80 percent effort to achieve energy efficiency that’s pretty easy and inexpensive. The last 20 percent of working toward net-zero energy consumption—or even positive energy generation—is where it gets much more challenging.”

Gamble is working with fellow Tech professors Godfried Augenbroe, Daniel Castro, Russell Gentry, Jason Brown and recent alumnus Stephen Taul, M Arch 12, M CRP 12, to lead a group of graduate architecture students on a three-year project...
to design, build and eventually occupy a net-zero energy apartment building near campus. Gamble says Tech students certainly aren’t the only ones attempting to create net-zero energy buildings today. But what makes this project unique is that they are tailoring their designs specifically to the challenges of modern, urban life in Atlanta.

Like other major cities around the country, Atlanta’s in-town neighborhoods are booming as more people, especially young people, move into the core of the city to be closer to jobs and entertainment and reduce their dependence on a car to get around. However, traditional single-family houses aren’t very practical for city life, where land is at a premium. As cities grow, the price of real estate rises too, making it harder for people to afford single-family houses.

“For the city to be affordable, there’s no escaping higher density,” Gamble says. “In most instances, that affordability is going to be achieved not through single-family houses, but through multi-family housing.”

And that’s the real ambition of the studio: to intersect affordability and energy balance, he says. “We’re trying to help our students understand all the forces in play around the debates and be savvy designers in the process.”

There are several ways to approach net-zero energy building. In Atlanta, the most practical tools for generating renewable energy are solar panels—thanks to its very sunny climate—and ground-source heat pumps. These pumps use the constant temperature of the earth as a bank, taking heat from the ground when it’s cold, or storing heat in the ground when it’s hot.

Smart, energy-conserving design is also critical to success, whether it’s building placement, systems efficiency or overall insulation and sealing. “The first line of defense in any efficient building or net-zero energy building is a well-insulated building envelope,” Gamble says.

The students’ early work has captured the attention of the international architecture and design communities. This past year, their models and drawings have been featured in several exhibits, including the Museum of Design Atlanta’s “Design for Social Impact.” Gamble says Georgia Tech was one of few universities invited to present student work at the “Dwell on Design” exhibit in Los Angeles this summer. And in the fall, the students will take their work on the road again to present it in New York.

At the end of the three-year project, students will participate in building a 12- to 20-unit building based on their designs. Though no site has been selected yet, Gamble hopes that it will be built near Georgia Tech’s campus.

Once completed, the plan is for students to live in it and test its performance first hand. Individual living habits introduce a lot of unexpected variables into the net-zero energy equation, Gamble says. “It can be difficult to ensure a home actually achieves the net-zero energy balance it was designed for.”

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**OF COURSE: COPYING MOTHER NATURE**

**BMED 4740: Bio Inspired Design**

**Instructor:** Jeanette Yen

**Objective:** “Examine evolutionary adaptation as a source for engineering design inspiration, utilizing principles of scaling, adaptability and robust multi-functionality that characterize biological systems.”

**Prerequisites:** BIOL 1520 or BIOL 3600 or BMED 3100/4751 or PHYSICS 2211 or permission of instructor.

**Problem Question:** “Each team will select a design problem, develop a biological analogy to the problem, learn about pertinent biological structures, processes, or systems, and produce a report or design that is biologically inspired.”

**Course Project:** “A team design project requires identifying relevant technical challenges, performing an effective search for natural systems that solve the appropriate technical challenges, understanding the technical challenges faced by natural systems, performing thorough technical analysis and comparison to existing designs, and generating innovative design ideas, all while using bio-inspiration in the design process.”

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**2,500 Weight [in pounds] of Tech’s new Space Object Research Telescope, the only one of its kind at a non-military U.S. academic institution**

**100%** Tech was one of 24 schools to get a perfect score in The Princeton Review’s annual Green Honor Roll.
An ancient paper-folding art form helped inspire the sci-fi worlds of the popular Transformers toys, cartoons and movies. Coming full circle, a Tech professor of electrical and computer engineering has been inspired in turn by Optimus Prime and crew to create high-tech, lightweight, adaptable antennas using—you guessed it—origami.

Last year, Manos Tentzeris and a team of Tech graduate students received a $2 million grant from the National Science Foundation to pursue this groundbreaking idea over a four-year period. Their shape-shifting antennas are hoped to accommodate a variety of environments and uses, from improving battlefield communications to charging household electronics.

And while Tentzeris says his research was inspired by futuristic designs showcased in sci-fi movies, his team is developing the technology using surprisingly low-tech and low-cost materials. “We are pioneering inkjet-printed electronics, which allow us to print conductive metals—such as copper and silver—onto regular paper, textiles and plastics,” Tentzeris says. “The method allows the antennas to unfold and move in response to electromagnetic signals.”

On top of being novel and new, the inkjet printing method also is more environmentally friendly. Tentzeris explains that the printing process is an additive process where layers are printed on top of one another to achieve the desired result. That means it doesn’t produce chemical waste.

So why origami? When it comes to antennas, different shapes are better suited for different functions, Tentzeris says. “The longer shapes are better for absorbing radio. Medium lengths are better for TV, and tiny shapes are better for Wi-Fi.”

The more complex shapes of origami have even greater potential to pick up different wavelengths, Tentzeris says. His team is planning to test conventional origami shapes, such as the iconic crane, against new ones. Master origamists have come up with complex shapes that include 30, 40 or even 50 folds.

Though the material may not seem like the logical choice, paper has many advantages. For one, it allows the antenna to fold up very small for transport and then expand into whatever shape necessary. This portability gives the antennas many potential uses. A soldier could easily fold an antenna into a pack and then unfold it wherever it’s needed on the battlefield.

The antenna would also be able to change shapes to accommodate the environment, whether it be a desert or a jungle.

Tentzeris even envisions the antennas being affixed to airplanes or space vehicles. “You could launch them at extremely low cost because they are tiny, and when they reach orbit, they will open up,” he says.

The Tech research team is ultimately working toward creating antennas that will change shape every few seconds based on their surroundings, coming to life by harvesting energy from the air. With cell phones, TVs and other electronics constantly on, “there’s a river of energy around us that we can use,” Tentzeris says.

He believes these antennas are just one possible way inkjet-printed electronics could be used in the future. “It’s no longer completely science fiction,” Tentzeris says. “And it’s just the tip of the iceberg.”
Philanthropy at Work

“Having the name of this renowned architect associated with the Dean’s chair highlights the emphasis on creativity and design that are the hallmark of the College.”

Dean Steven P. French, Ph.D., University of North Carolina-Chapel Hill

Holds the John Portman Chair in the College of Architecture, is the former associate dean for research, and a professor in city and regional planning.

Background photo: Elevator core within the 50-story sculptural atrium of the Atlanta Marriott Marquis, designed by John Portman.

- Steven P. French enjoys hiking, and his most recent adventures include the Austrian Alps and the Canadian Rockies.
- Hometown: Providence Forge, Virginia

The goal of 100 endowed chairs and professorships is a top priority for Campaign Georgia Tech, the $1.5 billion effort to enable Georgia Tech to define the technological research university of the twenty-first century.
How Playing ‘Angry Birds’ Could Help Autistic Children

Using a small robot and a tablet computer, Georgia Tech researchers have created a unique way to help children with disabilities. The researchers believe interacting with a robot and teaching it to play the popular Angry Birds video game could be a meaningful rehabilitation tool for children with motor impairments and autism spectrum disorders. The Tech research team, led by Professor Ayanna Howard, has developed a small humanoid robot that is able to observe and mimic human behaviors. The adorable robot even celebrates with a dance and a happy sound when it makes a successful move in the game. Howard says kids feel a special bond with the robot and stay engaged longer by showing it how to play.

FROM HELLUVA ENGINEER TO PRESIDENT OF PANAMA

Juan Carlos Varela, IE 85, was inaugurated as the president of Panama on July 1. Varela, who previously served as the country’s vice president, is considered a free-market conservative who won the election with 39 percent of the vote. His inauguration ceremony was attended by American dignitaries such as U.S. Secretary of State John Kerry, U.S. Ambassador to the Republic of Panama Jonathan D. Farrar and Atlanta Mayor Kasim Reed. As president, Varela will oversee the planned expansion of the Panama Canal—which Tech engineers helped design and build.
A SHINING EXAMPLE FOR WOMEN PROGRAMMERS

Tesca Fitzgerald, a 17-year-old doctoral student at Georgia Tech, was selected by Google this summer as one of 11 women to be part of its new “Made With Code” initiative, which champions women’s involvement and creativity in the world of computer coding. At Tech, Fitzgerald’s research focuses on human-robot interaction and cognitive science, in particular how robots can learn from people in much the same way people learn from each other. Fitzgerald has loved robotics from an early age, having programmed her first robot when she was 5. She envisions a future with intelligent robots where they can help doctors diagnose diseases and stand in for humans in dangerous situations.

TECH SPORTS HALL OF FAME CLASS OF 2014 ANNOUNCED

The Georgia Tech Athletic Association has announced the 2014 class of inductees into the Georgia Tech Sports Hall of Fame. This year’s class includes: football player James Butler [1], who holds the Yellow Jacket’s single-season record for tackles by a defensive back; track and field star Michael Johnson [2], who was part of Tech’s 4x400 relay squad that won a national championship at the 1998 NCAA Outdoor Championships; basketball player Alvin Jones [3], the leading shot blocker in Georgia Tech history; football player Luke Manget [4], a two-time first team All-ACC kicker; volleyball standout and three-time American Volleyball Coaches Association All-American Lynnette Moster; and baseball catcher Bryan Prinze, who helped Georgia Tech win the 2000 ACC regular season and tournament championships, as well as the NCAA Atlanta Regional title. They will be honored at a dinner on Oct. 10 at the Georgia Tech Hotel and Conference Center.

WOWING OBAMA AT WHITE HOUSE MAKER FAIRE

Georgia Tech was one of just three universities nationwide to present a student project to President Barack Obama at the first White House Maker Faire this summer. Biomedical engineering student Partha Unnava got a chance to show Obama first-hand the Better Walk Crutch, an invention that Unnava and two fellow students developed at Tech. Unnava came up with the idea for the innovative crutch after he broke his ankle playing basketball. He hated using regular crutches, and decided he wanted to design a more comfortable solution. Better Walk has since been part of a medical device accelerator program for startups, raised $150,000 in seed funding and obtained letters of intent from orthopedic surgeons who want to see the new crutch made available in the marketplace.
If you fractured your femur, a doctor would likely insert a rod into your bone shaft to hold the bone together and help it heal. It's an effective solution, but the process of inserting the screws to hold the bone and rod together is difficult. And because radiation is involved, it's also somewhat risky. Or, at least, it used to be: In tandem with the medical company Smith and Nephew, a team of five Georgia Tech students last year—working together on their Senior Capsule Design Project—developed a simple, low-cost technique to help overcome these challenges.

Thanks to the Capstone Design Project's emphasis on real-world development, these students didn't work on the problem in a vacuum. They talked to doctors, studied cadavers and tested numerous options. After zeroing in on the best solution, they built a successful prototype that required no radiation. The product and the technique they developed has the potential to benefit people who often cannot afford expensive medical care. And although her team can't discuss the project in depth—thanks to a nondisclosure agreement with Smith and Nephew—Elizabeth Morris, BME 14, says the company was “thrilled with their work.”

Indeed, the Senior Capstone Design Project has been reimagined and overhauled over the past several years. Today’s projects give students a chance to build prototypes, tackle true-to-life challenges and work closely with industry partners and students from other majors. “Through the Capstone Design Project, we want to give students the resources—time, funding, space, support—to turn their inventions into real commercial devices,” says Bioengineering Associate Professor Craig Forest, ME 01, who helps direct the project curriculum.

Once a project that could be completed with simply a series of academic papers, PowerPoints and poster sessions, the Senior Capstone Design Project garnered little student interest in the past. “For most students, it was just one more thing to check off their list before graduation,” admits Amit Jariwala, director of design and innovation for the School of Mechanical Engineering. “Now it’s a springboard for them to show employers what they’re truly capable of, or perhaps even an entry point into becoming entrepreneurs.”
To boost student enthusiasm—and position graduates well for future jobs—Jariwala and Forest, with support from the administration and other faculty, began making systematic improvements. They created an Invention Studio for students to build prototypes and gave all teams budgets of $500 to make their project come alive. They invited industry sponsors to share some of their toughest problems and benefit from Tech’s student brainpower. And perhaps most important, they created a Capstone Design Expo at the end of each semester where students presented their projects to visitors, judges and potential future employers.

The process is both demanding and inspiring. Students form a team—usually four to six students from a variety of disciplines ranging from engineering to business to public policy—and a project based on their own interests or industry requests. They conduct extensive market research and work closely with fellow students, faculty and industry experts to hone their projects.

The teams find out quickly that the technical aspects of the projects aren’t the only challenges that they face. “Our team was comprised of people from not only different majors, but also backgrounds and cultures, and there were some communication issues” says Aditi Chandak, ME 14, whose Capstone Project aimed to reduce noise produced by tools in aircraft manufacturing. “But I think our diversity of experiences also allowed us to pursue many more ideas than we would have otherwise.”

While many students are used to learning alone and being graded for individual performances, Capstone Design teams replicate the kind of collaboration that students will need to succeed in jobs after graduation, Jariwala says.

Interest in the projects—and the Expo—has soared. Five years ago, the Expo consisted of fewer than 30 teams, all from the School of Mechanical Engineering. Last spring, the event attracted 170 teams that included students from nine different majors. More than 5,000 people, including dozens of industry recruiters, attended. The Expo was even covered by local television, radio and newspapers.

The teams competed for a top prize of $3,000, but the potential impact is far greater than the one-time financial reward. Chandak’s work with aircrafts, for example, helped her land a full-time position with Boeing Commercial Airlines. Another team, which developed a machine to help basketball players take practice shots more efficiently, has submitted a provisional patent application and has attracted investor interest.

Though the results have been significant already, Jariwala and Forest agree that there are even bigger possibilities down the road. Forest wants students from every major in the school to participate, and he hopes to increase collaboration between students campus wide. He’s ready to add larger spaces for a machine shop that’s currently bursting at the seams. And he wants to increase the number of industry sponsors. “We want to turbocharge these activities,” he says. “We want to be the national leader in entrepreneurial and invention activity.”

Above, Senior Capstone Design Projects range from electronics to biomedical engineering. Opposite page, Elizabeth Morris’ Team Spot-On won best overall project at the Spring 2014 Capstone Design Expo.
Designing Tiny Treatments for Big Cancer

Georgia Tech molecular biologists, led by John McDonald, are pioneering new methods of attacking tumors using nanoparticles.

Since his arrival on campus in 2004, molecular biologist and Tech Professor John McDonald has been hard at work developing new solutions and strategies for targeting and treating cancer. Some of his latest research concerns the use of nanoparticles to seek out and deliver treatments to ovarian cancer cells without damaging the body’s healthy cells. Designing this technology has required collaboration between the McDonald Lab in the School of Biology and Andrew Lyon’s lab in the School of Chemistry.

Your lab is designing treatment methods that deliver medications through nanoparticles. What exactly is a nanoparticle?

Basically, they are synthetic particles that are smaller than viruses—there are all kinds of different nanoparticles. The kind we’re developing with the Lyon lab is a nano-hydrogel. They are 98 percent water, and I think of them sort of as microscopic sponges: When you put them in water they swell up and soak up the solution that’s around them. The therapeutic treatment we are using involves small regulatory RNAs [ribonucleic acid], and we use a technique called “breathing in,” because when the particles are exposed to the solution containing the therapeutic RNAs, they self-load the RNA into the particle.

How can a nanoparticle deliver medication to a cancer cell?

The next part of the design is functionalizing the particle. The particle has to be modified in such a way that it binds to the specific cells you want to target. The problem with chemotherapy is that it’s typically given systemically to all exposed cells, not just cancerous cells. In our case, we want to treat only the cancerous cells while leaving the healthy cells alone. This can be accomplished by identifying a surface feature that is unique to the cancer cell, and then engineering the nanoparticle to selectively attach to that feature.

How can a nanoparticle identify a cancer cell in the body?

Nanoparticles injected into the bloodstream will circulate through the circulatory system looking for the targeted cancer cells. Once the nanoparticle encounters a cancer cell and attaches to the surface feature, the nanoparticle is taken up by the cell and the therapeutic treatment is slowly released. Nanoparticles have pores in them so that they will release the RNA payload at a controlled rate. In our pilot experiments, we have added a molecule to the nanoparticle that binds to a particular receptor protein that we know is highly expressed on the surface of ovarian cancer cells. In the future, nanoparticles will be designed to target other cell features unique to other types of cancer.

Your therapeutic treatment uses RNA instead of a drug. What is the difference between the two?

Think of the blueprint of the new Engineered Biosystems Building going up on campus. If you’re the guy building the foundation, you’re only interested in examining the section describing how to build the foundation. You don’t care how the roof is built. By analogy, DNA is carried in every cell in our body and is the blueprint of all cellular functions. But liver cells, for example, don’t care how to conduct brain cell functions so they transfer from the DNA blueprint the specific subset of information needed for liver cell function into a type of RNA called mRNA. This mRNA then serves as the template for synthesis of the proteins necessary for liver cell function. Take that concept and apply it to cancer. Cancer is a disease of misinformation. The cell is getting the wrong information—for example, it is being told to rapidly divide when it should remain quiescent. That misinformation could occur due to an error in the DNA blueprinting itself. CONTINUED ON P. 22
We call such mistakes “mutations.” Alternatively, there could be a mistake in the flow of information from the DNA such that, for instance, mRNA is being produced when it should not be. The bottom line, in either case, is that abnormal kinds or levels of proteins are produced leading to formation of cancer cells. A new class of cancer drugs are currently being developed to target abnormal or abnormally expressed proteins in cancer cells. Many of these new targeted drugs show great promise but it is estimated that only 10 percent of proteins are “drugable” in this way. Thus, we are interested in developing therapies that can target abnormal or abnormally expressed genes on the mRNA rather than on the protein level. In theory all genes can be targeted on the mRNA level using small inhibitory RNAs. The problem is how do we deliver these inhibitory RNAs specifically to cancer cells? That leads us back to nanoparticles.

What problems are posed by traditional, systemic cancer treatments? Ideally, we would prefer not to deliver inhibitory (or any) drug treatments systemically because of the unintended inhibitory effects they might have on normal healthy cells. In some cases these “negative side effects” can be quite severe or even lethal.

You’ve been working with Andrew Lyon of the School of Chemistry to develop the nanoparticles. How collaborative has this design process been?

Very collaborative. That’s the beauty of Georgia Tech: You have experts with the specialties you need right next door. I believe this kind of integrated approach will help Georgia Tech significantly contribute to cancer research in the future.

How involved were you with the nanoparticle’s design?

Dr. Lyon’s group had already developed the basic nanoparticle. A former post-doc in my lab, Erin Dickerson, a current research scientist, Roman Mezencev, and I discussed with Dr. Lyon various strategies to further engineer these particles to optimally deliver therapeutic RNAs to ovarian cancer cells. My lab provides the biological knowledge and Dr. Lyon’s lab provides the technical expertise to move the project forward.

What is the next step after designing the nanoparticle?

The next question one asks is, “Does it work?” We first tested the ability of the nanoparticles to deliver the therapeutic RNAs to cancer cells grown in culture. This worked very well which led us to the next level—testing delivery and efficiency in animal models.

Animal testing is currently underway. What obstacles stand in the way of making the treatment available to the public?

There are a number of things the FDA requires before approving any treatment like this for use in humans. We first have to show that these particles are non-toxic in their own right. We have recently demonstrated that this is the case. Now we have to demonstrate efficacy, that is, we have to show that treatment with these particles lowers or reduces the burden of cancer in experimental animals. Once that is validated, one can apply for FDA approval for Phase I experimental trials in humans.

Once the design for ovarian cancer treatment is released, what do you do? Start developing designs for other types of cancer?

At that point, the technology development would be done and the technology would move into the commercial sector. That’s not my area of expertise so I would leave that to someone more qualified. My job as a scientist would be to develop new types of RNAs that might be even more effective in treating different cancers, while using the same or maybe an improved class of delivery vehicles. We continue to work with other Georgia Tech researchers to develop even better delivery systems, as well as new and imaginative cancer diagnostics and therapeutics. It’s all about continued integration and collaboration. That’s one of the great things about being a scientist at Georgia Tech.
GEORGIA TECH FOOTBALL

2014 HOME SCHEDULE

WOFFORD
August 30

GEORGIA SOUTHERN
September 13

MIAMI
October 4

DUKE
October 11

VIRGINIA
November 1

CLEMSON
November 15

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NEW BENEFITS FOR 2014!

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Yellow Jackets 2013-14 Year in Review

Teams and student-athletes scored remarkable seasons on the field and in the classroom.

FOOTBALL

3
Players Selected in the 2014 NFL Draft
OLB Jeremiah Attaochu (2nd Round)
S Jamea Thomas (6th Round)
OLB Brandon Watts (7th Round)

299.3
Average yards rushing per game

48
Rushing TDs
(Tied for 1st Place in NCAA)

17
Consecutive Bowl Games
Nation's Third Longest Streak
42nd Bowl Game All-Time

MEN’S BASKETBALL

1,295
All-Time Team Wins

99th
Season
1st Game, Feb. 17, 1906 vs. Auburn

WOMEN’S BASKETBALL

2,549
Team Points Scored
Second Most in Lady Yellow Jackets History

7
No. of 20-Win Seasons in Last 8 Years

14th
Overall Pick in WNBA Draft
Tyaunna Marshall, SG

Miller Time

Daniel Miller
6’11”, 275 lbs.
7.8 Rebounds, 2.42 Blocks
All-ACC Defensive Team
126 Starts / Every Game During 4-Year Career

No. of NCAA Appearances in Last 8 Years

- 2,129 Career Points, 17th on ACC Career Scoring List
- 196 Points, 76 Rebounds, 27 Steals, 31 Assists Per Game in 2013-14 Season
- First-Team All-ACC, All-ACC Defensive Team
ACADEMICS

**TOP 10%**

Ranking of Men’s Football, Men’s Golf, Women’s Tennis and Men’s Swimming in Academic Progress Rate (APR)

- First time for Women’s Tennis and Men’s Swimming
- Men’s Golf has scored perfect 1.000 since APR tracking began.

**143**

Student Athletes on Dean’s List in Spring 2014 Semester

**3.00 GPA**

Mean Grade Point Average of 356 Student-Athletes

- Women’s Tennis Led All Sports Teams with 3.53 GPA for Spring 2014 Semester
- Men’s Football Achieved 2.65 GPA, Highest Since Fall 2008

**MEN’S GOLF**

**15th**

ACC Title

Ranked No. 2 Team in Country By Golfweek

**5 INDIVIDUAL TITLES THIS SEASON**

Ollie Schniederjans

- Most Ever by a Tech Player in a Single Season
- Ranked No. 4 Individually in World Amateur Rankings
- 69.51 Relative Scoring Average

**SWIMMING & DIVING**

**6 Tech Swimmers Qualified for NCAA Championship**

- Andrew Kosic—50M and 100M Freestyle, 100M Butterfly (All-American Honors)
- Nico van Duijn—100M and 200M Butterfly, 50M Freestyle
- Kosic, van Duijn, Taylor Wilson, Ricky Lehner—200M Medley Team Relay
- Kosic, van Duijn, Mats Westergren, Declan Poorman—800M Freestyle Team Relay

**BASEBALL**

**9-4**

Final Score of ACC Championship Game

Tech Defeats Maryland to Win Ninth ACC Title

**TRACK & FIELD**

**2 Yellow Jackets Earned All-American Honors**

Jonathan Gardner, Triple Jump
Nikita Kirillov, High Jump

Honorable Mention: Julienne McKee, Long and Triple Jumps, Jeremy Greenwald, 10000M

**WOMEN’S TENNIS**

**No. 18 National Ranking, Intercollegiate Tennis Association**

15th Consecutive Trip to NCAA Tournament

**Student-Athlete Majors**

- Business 47%
- Sciences 6%
- Engineering 27%
- Ivan Allen/Liberal Arts 15%
On the FIELD

The latest buzz from Tech’s athletic teams and alumni.

Killer Instinct

Not only did senior Courtney Felinski menace Yellow Jacket foes last year with devastating spikes and serves, she also killed her coursework—earning ACC All-Academic Volleyball honors with a 3.75 GPA

How long have you been playing volleyball? Why volleyball over other sports? I started playing volleyball when I was 11, so it’s been about 10 years. I played just about every sport growing up, and I honestly chose to pursue volleyball because it was the last sport I picked up. It was new and exciting, and I was eager to learn more. Obviously it worked out well!

You’re from Texas. How did you choose Tech? As much as I love my home state, I always knew I didn’t want to stay in Texas. So many people I knew stayed close to home, but I wanted to expand my horizons a bit, so I looked out of state. Tech had the academic challenge I wanted coupled with a strong athletic program, and I could see myself fitting in with the team really well. Adding all that up pretty much made the choice a no-brainer.

What’s been your favorite playing memory as a Yellow Jacket so far? By far, it’s when we beat No. 18-ranked Florida State last season. We won in four games, played a great match as a team, I got the game-winning kill—and it was my birthday. It doesn’t get much better than that.

You had a great season last year as a junior; how do you plan to build upon it during your final season at Tech? I just want to keep getting better for as long as I can. There’s always that extra push of motivation when you realize it’s your last season, and I want to leave the program in better shape than when I arrived.

How difficult is it to be an ACC All-Academic athlete, balancing a formidable Tech education with playing at such a high level? It’s definitely a difficult balance at times, and sacrifices have to be made in certain areas. Tech is not an easy place to handle, but my teammates and I are very lucky to have so much support from our athletic association. They provide so many resources to ensure our success that it seems almost impossible to fail. As long as you can manage your time well and do as much schoolwork as possible when you have the chance, it isn’t so bad. There has never been a time when I thought all the work wasn’t worth it.

What’s your favorite thing to do besides play volleyball? I love to read, and I always have. It’s actually a dream of mine to be a published author, and I love the knowledge that what I’m reading came from someone’s imagination. That’s pretty inspiring to me.
In July of 2011, the National Collegiate Athletic Association (NCAA) Division I Committee on Infractions found the Georgia Institute of Technology men’s basketball and football programs responsible for committing violations of NCAA legislation. The Institute was cited for a lack of cooperation during the investigation, a failure to meet the conditions and obligations of membership, and preferential treatment violations. Also cited were additional violations in the men’s basketball program related to the conduct of a non-scholastic men’s basketball tournament on campus. The NCAA public report further details all of the findings.

Penalties Included:
- Public reprimand and censure.
- Four years of probation from July 14, 2011 through July 13, 2015.
- A $100,000 financial penalty.
- A reduction of two men’s basketball recruiting days during the 2011 summer evaluation period (self-imposed by the Institute).
- A limit of 10 official visits for the men’s basketball program for the 2011-12 and 2012-13 academic years, respectively.
- Vacations of contests won by the football team during the 2009 season after November 24, which is when the university was alerted to potential eligibility issues.

As a result of the exhaustive investigation and review process and because of Georgia Tech’s steadfast commitment to compliance, the Institute completely revamped and enhanced its athletics compliance operation and staffing. The Institute remains committed to operating all of its athletics programs within the letter and spirit of NCAA, ACC, and Institute rules and regulations.
Making Movie-Set Magic

It’s likely that more people have seen the buildings Justin O’Neal Miller, Arch 05, helped design than have witnessed the work of the world’s top architects. The major difference, however, is that his constructions aren’t exactly real. Miller has served as a set designer and art director for several major film and TV productions, including *The Walking Dead*, 42 and *Hunger Games: Mockingjay Parts 1 and 2*—all of which were at least partly filmed in Georgia. He takes the *Alumni Magazine* behind the scenes of his career as a movie illusionist.

After graduating from Tech, Miller found work at a couple leading architecture firms but got laid off during the 2009 economic downturn. Looking for a job, he used his contacts to land a gig as a neophyte set designer on *Big Mommas: Like Father, Like Son*, the third title in Martin Lawrence’s comedy trilogy. “It might not have been the artistic project I had always hoped for,” Miller says, “but it was a good place to start. I’m lucky to have known the right people to get my foot in the door.”

On set, Miller was surprised to find out how seamlessly his architecture skills and training would translate to the movie world. “My job as a set designer was to take the production designer’s vision—the big ideas and drawings—and turn them into something a contractor could understand and build,” Miller says. “In many ways, it was exactly what I did as an architect. I’d draw up plans using Autocad and hand them off to be constructed.”

What turned out to be very different from architecture, however, was the near-immediate turnaround on a film production. “For example, on one particular architecture project I did nothing but design doors for three months,” he says. “On *Big Mommas*, one morning I came into work and found a set I’d designed the night before almost done and ready for filming. That building with the doors I helped design? It took five years to complete. Maybe it’s not a fair comparison, especially since movie sets are basically illusions that don’t have to meet building codes.”

CONTINUED ON P. 30

Miller designed the infamous zombie barn that went up in flames during season two of *The Walking Dead*. 

Roger Slavens
There’s certainly great satisfaction for Miller to see what he’s designed turned into reality so quickly, as well as for his sets to be seen by so many people. If you’re a TV watcher or moviegoer, you’ve more than likely have witnessed examples of his craft, which include:

- The barn full of zombies on Hershel’s farm in *The Walking Dead*, which dramatically goes up in flames at the end of season two.
- The well Glenn had to descend into to lure a zombie away from the survivors’ potential water supply.
- The recreation of Ebbets Field for the Jackie Robinson biopic, *42*, which was retrofitted into the existing Engel Field in Chattanooga, Tenn.
- The office of Brooklyn Dodgers owner Branch Rickey in *42*.
- Mundane suburban exteriors in *Prisoners*, an intense indie drama starring Hugh Jackman and Jake Gyllenhaal, which was filmed in Tucker and Stone Mountain.
- Living quarters, a cafeteria, the dam, Tigris’ shop and Capitol streets in the upcoming *Hunger Games: Mockingjay Part 1*.

Miller truly felt like he had made the big leagues of set design when he was hired for *42*, which was released last summer. “The scale of the project and size of team and the multitude of locations were what I expected from a Hollywood production,” he says. “It was also the first time where I got to see everything happen and I was more involved in the decision-making process.”

His current project is a biopic about jazz great Buddy Bolden, a cornet player idolized by Louis Armstrong. “*Bolden!* is set at the turn of the 20th century, and we’re trying to recreate the seedy Storyville red-light district of New Orleans,” Miller says. “The main challenge is that this world is old and falling apart, so we’ve had to use outdated building techniques to put up structures that slump and decay in authentic ways. We want this world to seem real and lived in.”

For set designers, every film project is very different and that keeps things interesting for Miller. “Mockingjay was a complete departure from *Bolden!*” Miller says. “Not only does it take place in an apocalyptic and futuristic world, but it’s one that’s already been described in great detail in the *Hunger Games* books. You have to be very careful with the design choices you make.”

Miller took a step up from set designer to assistant art director on *Mockingjay Part 1*, and he’s also served as full art director on other projects. However, he’s quick to point out that he’s still mainly supporting the visual wishes of the production designer and director. “My job is still deep in the details, picking wallpaper and building materials and room shapes that fit their vision,” he says.
As he looks to move up, however, he has a bigger career goal: He wants to write and direct his own movies. He’s already made two short films that have toured the festival circuits, and he’s trying to find time between set design gigs to finish a third. “I’m lucky I’ve been able to work in close proximity to directors like Frank Darabont and Edgar Wright to learn from them,” Miller says.

For now, however, he’s happy with being an art director and set designer—especially since the movie industry has become so strong in the region. “More and more productions are coming to Georgia because of the tax-incentive programs and lower cost of filming,” Miller says. “At one time I considered moving to Hollywood, but why should I do that when Hollywood has come to me?”

Mockingjay Part 1 required Miller to recreate locations from the already well-imagined world of The Hunger Games, presenting him with a uniquely difficult challenge.
Creating a New Food from Scratch

In designing Soylent, Tech alumnus Rob Rhinehart tackles the problem of food and eating from an engineer’s distinct point of view.

Before Rob Rhinehart, CS 12, designed a completely new food source from scratch, he basically survived on two core food groups—red meat and pasta. “It wasn’t particularly healthy,” he says. “But I liked foods that packed calories, were easy to prepare and were affordable. Now I have a better version of that.” That better version is Soylent, a powder that when mixed with water, comprises the elements of a complete and healthy adult diet replete with calories, protein, carbs, fiber, vitamins and even a little fat. The thick, beige-colored liquid with a mild taste (some have said it reminds them of pancake batter) might appear like a mere substitute for the fruits, vegetables and meat that we rely on. But Rhinehart is unfailingly clear: Soylent is food, albeit with a far more efficiently engineered approach.

Rhinehart wanted to eliminate the waste in this food bottleneck to get back to learning and working.

“We could solve our engineering problems, optimize, and make a lot of our products and processes more efficient at work,” he says. “But food always got in the way.”

When he tried to eat healthfully, food was time-consuming and expensive. When he cut corners for the sake of his energy and wallet, he’d end up chowing down on peanut butter sandwiches or cheeseburgers almost every day.

Rhinehart wanted to eliminate the waste in this food bottleneck so he could get back to learning and working. He hated the menial tasks food required, like driving to the grocery store, standing in line, preparing food, then cleaning up afterwards. He could have avoided those chores by hiring someone else to do them for him.

Rhinehart blogged about his project and shared the recipe-in-progress for Soylent on Reddit, a social networking website where community members post questions and trade tips. CONTINUED ON P. 34
Comments soared. People launched their own trials based on his core formula, testing out unique recipes based on flavor or dietary preference.

Rhinehart said that drinking soylent every day had given him a better lifestyle—one of his own design, free from the constraints of standardized food consumption. He subsisted almost exclusively on soylent alone for almost a year, and he says his health and energy improved dramatically. He was joined by a host of believers who discovered much the same benefits.

By early 2013, his wireless communications startup was on the back burner and Rhinehart and his team relocated to Los Angeles. They brought soylent to the crowd-funding site CrowdTilt in May, offering supply packages of the sustainable powder for one week, two weeks or one month for varying levels of donations. His total ask for just $100,000 more than succeeded—the campaign has raised a whopping $3 million by March 2014, funded by more than 20,000 backers.

Along the way, soylent gained an additional $1.5 million in a seed round of financing. He was officially in the food business now—soylent is regulated by the Food and Drug Administration. But the engineer soon found himself in a strange predicament, facing inquiries as to why he wanted to stick a fork in food.

“We’re not targeting your dinner party,” Rhinehart says of the skeptics. Special nights out and birthday celebrations still have a place in his heart (and belly). “It’s important to realize though, those occasions are more about the people than the food. It’s the conversation, the camaraderie, that I see as the real pleasure.” But that $30 entrée many ooh and ahh over: “It’s just something that’s there.”

Soylent is challenging the staple meals, the ones that Rhinehart says take up 40 to 80 percent of our dining life. He would like for us to trade hurried breakfasts scarfed down en route to work and stressed-out lunches inhaled pre-deadline for a subscription to soylent. (Supplies start at $70 per month for 21-plus “meals”.) Staple meals are usually where people have the most problems, he says, in terms of maintaining a healthful diet. That’s where soylent just makes sense.

Naysayers don’t bother Rhinehart—he’s certain that food as a biotech venture will only increase as time goes on and our agricultural resources are exhausted. Perhaps his view is a natural perspective for someone who lingered in the sci-fi and philosophy sections of the library as a kid. Growing up in the Atlanta suburbs, Rhinehart read Make Room! Make Room!, the Harry Harrison novel about the dangers of population growth that inspired the Charlton Heston film Soylent Green.

It’s important to note that Soylent Green changed the novel’s plot and theme considerably, with Heston’s character at the end of the movie realizing that the titular foodstuff created to feed people “is people!” Rhinehart has embraced that irony with his wry sense of humor and didn’t flinch from any confusion the name soylent might create among those more familiar with the film than the book.

Even when he was just 8 years old, Rhinehart says he deplored the food waste in dumpsters. As he got older, that disgust transferred to the massive amounts of land and labor swallowed up by the industrial food supply chain. “I guess I’ve always intuitively realized that it wasn’t going to scale all the way,” he says. “It’s too chaotic. That idea of having a cheap, essential staple called soylent that the population lived on in the book, I guess that made a lot of sense to me.”

Apparently, soylent appeals to a diverse group of people, from consumers to potential business partners. Rhinehart
Rhinehart won’t disclose the company’s earnings or how many customers they serve, but he says they’re profitable. Even the U.S. military and NASA have come calling, and partnerships with NGOs are in the works so Soylent can be used in an aid capacity to developing nations.

But that’s all down the line. Today, Rhinehart continues to test product developments, study food science and and manage Soylent’s ever-volatile supply chain. He was worried that the food business would push him toward becoming a marketer rather than an engineer. However, he discovered that Soylent keeps him in a challenging design environment, where he gets to play with taste profiles and a complex e-commerce infrastructure.

More than anything, he’s enjoying his freedom. Rhinehart says he hasn’t been to a grocery store in years and he never does the dishes. The contents of his fridge? Beer and Soylent. “I still eat regular food,” Rhinehart says. “I just eat the meals that I want to.”

The best benefit of Soylent, Rhinehart says, is seeing how it impacts people’s lives in such a personal and profound way. He anticipates many more changes on the food landscape. And those skeptics—he thinks they should loosen up.

“Food has always changed, and it’s going to continue to change,” Rhinehart says. “It’s not sacred.” ▲
After graduating from Tech, Aman Advani went into consulting—a career move than involved a lot of long working days and a lot of air travel. Neither was good for keeping his professional clothes fresh. Advani noticed that his cotton dress shirts easily wilted and wrinkled, and they were unforgiving to perspiration.

Advani and some of his colleagues, however, noticed that the exercise clothing they’d change into after hours was far more comfortable. It was made from higher tech materials that were designed to react to temperature and moisture. “We all had similar stories,” Advani says. “How can you take that comfort and bring it into the other 23 hours of the day?”

They decided there was no reason their business clothes couldn’t perform as well as their athletic gear. Advani joined Kit Hicken and Gihan Amarairieawdina to found Ministry of Supply in 2011. The following year the company launched the finished products in its clothing line, which Ministry of Supply dubs “Performance Professional” apparel.

Advani says their clothes are designed for fast-paced people who love what they do and keep a fuzzy line between work and life—and want to look good doing it. “We get up at 7 a.m., get on a train, car, airplane.” Advani says. “It’s hot outside, cold outside; we meet a friend for dinner; get a drink with a client. Everything is wrinkle-free and moisture wicking. People don’t have time to go to the dry cleaner. They don’t want to have to go home and change.”

Advani says Ministry of Supply designs its clothing by blending high-tech fabrics and manufacturing techniques with traditional fashion design. For example, one of the company’s dress shirts is made using phase-change materials, which NASA uses in space suits to regulate body temperature. It stores heat when you’re hot and releases it back to you when you’re cold, Advani says.

The company’s designers also develop their own materials when there aren’t existing products on the market that do what they’d like. “In a lot of ways we think of ourselves more of a product design company then a fashion company,” Advani says.

Advani says another strategy they’ve taken is working with manufacturers who don’t typically produce dress clothes. “One of the challenges we didn’t really anticipate is that most of these techniques exist—they’ve just never existed in this world,” he says.

One of these techniques is called thermal lamination, which Ministry of Supply uses to create a crisp, smooth collar on a dress shirt. Thermal lamination is more commonly used to make things like the bill on the hood of a high-end rain jacket.

“Half the battle is invention and half the battle is application,” Advani says. “One of the major challenges is you’re either training someone who knows these techniques to make a great dress shirt, or teaching an Italian dress shirt manufacturer that’s been around for 200 years to update its technology. How do you get a dress shirt maker to buy a laser cutter? That’s just not going to happen.”

Aesthetics are also very important for the company. Early on, fashion designers were brought in to create a sharp, tailored look. “That’s really the point of all this technology. To make a better garment that’s more suited for your day and makes you feel better when you’re wearing it,” Advani says.

Know a Ramblin’ Wreck with a fascinating job? Tell us all about their interesting career at publications@gtalumni.org.
- **Atlas Dress Socks (above):** Features recycled coffee grounds sewn into the material to fight off foot odor.
- **Apollo Dress Shirt (right):** Employs phase-change materials to help regulate your body temperature.
- **Atmos Polo (below):** Knitted robotically so it’s seamless and won’t irritate your skin.
- **Aviator Chinos (bottom right):** Designed to stay (and look) cool with ventilation and moisture wicking fabric.
Flagging Down His Soccer Dreams

Tech engineering grad finds a special way to keep futbol front and center.

Corey Rockwell, IE 98, attended this summer’s World Cup as a spectator—and that suited him just fine. Though he would have loved to officiate games at soccer’s biggest event, after 10 years working for Major League Soccer in the United States, he thought going as a fan would be far less stressful. Then he got to Brazil.

While Rockwell describes his World Cup experience as the trip of a lifetime, he also couldn’t have anticipated some of the situations he found himself in. On the day of the USA-Germany match, for instance, heavy flooding had washed out all the roads leading to the stadium, and taxis refused to drive them. To make it to the match, Rockwell and his friends had to take two trains and a bus, then they had to walk in a downpour for about two hours.

Yes, he’s that passionate about soccer. Growing up, Rockwell played soccer constantly and followed its professional ranks as closely as he could living in the U.S. As a Tech freshman in 1992, he joined the Institute’s club soccer team. But soon, Rockwell realized he “needed to start paying for college” and also focus more on his engineering coursework.

That’s when he turned to refereeing.

By the time he earned his degree in 1998, Rockwell had officiated the NCAA men’s soccer Sweet 16 and began to see refereeing as more than a source of income. The switch was far from glamorous: traveling long hours to referee small tournaments in neighboring states, often for very little pay. And the work was year-round, while college soccer is structured in a less-demanding, three-month system. Even so, Rockwell loved the experience.

Meanwhile, he landed a full-time job as an industrial engineer with the Clorox Company in Atlanta. The opportunities opening up in his career might have offered some incentive to focus on engineering alone, but Rockwell continued to chase his passion.

It wasn’t until 2004—six years after graduating Tech—that Rockwell caught what he calls his “big break.” He was working a soccer tournament in Minnesota when someone within the professional refereeing system approached him with some good news. “I was told I had a chance to do Major League Soccer,” Rockwell says. “That’s when I started really concentrating, trying to make it to the next level.”

Rockwell stuck to a strict workout regimen, and he continued burning his vacation days with Clorox to work various tournaments and matches across the country. The commitment paid off: In 2005, Rockwell qualified to be a MLS referee and he’s been officiating at that level ever since.

As his soccer refereeing dreams took flight, Rockwell’s career at
Clorox bloomed. He received a series of promotions that elevated him from engineering to management.

Even as his day job responsibilities have increased, Rockwell maintains a busy schedule with MLS. He typically works MLS matches on three weekends out of every month during the season, with some Wednesday night matches mixed in. The engineer said the logistics can be tough, but he’s found a way to make it work.

“I’m always honest about my schedule,” Rockwell says. “I can’t call in sick and show up on ESPN that night.”

The physical demands of officiating have also increased as he’s moved up. According to Rockwell, all USA Soccer FIFA officials have to wear Polar brand sport watches that record their heart rate data and workout regimens. This data has to be downloaded and sent to FIFA on a regular basis to ensure officials remain in top shape. If officials fail to meet certain minimum standards, they are ineligible to officiate the matches.

Rockwell doesn’t just meet the standards set by FIFA—he excels. In 2011, he was named the top assistant referee in Major League Soccer. His resume is strong enough that Rockwell could pursue eligibility to referee at a future World Cup, but the engineer says he’s unlikely to take that step.

Just to be considered to officiate at a World Cup, referees must first endure intensive training and testing, as well as work various tournaments around the globe. Rockwell said he knows of one World Cup ref who had to go to Nigeria for five weeks to work at under-20 tournaments, and afterward had to complete a fitness test in Trinidad.

“I don’t think my job would let me take off five weeks several times a year,” he says. “And in fairness, it isn’t something I’ve asked for, either.”

While the World Cup is not on his radar, Rockwell still hopes to take part in the next World Cup qualifying process, which wouldn’t require the same training or time commitment as a full tournament.

Regardless, Rockwell believes he’s in the perfect work environment to continue living his dream as a soccer official. Germany-based Henkel acquired Rockwell’s division from Clorox in 2003, and Rockwell currently works as the Regional Head of Corporate Audit for North and Latin America. Over the summer, everyone in Henkel’s U.S. offices was carefully watching each Germany match leading up to the team’s World Cup victory.

“Luckily, a lot of the people I report to are soccer fans,” Rockwell says. “They encouraged us to watch the games when Germany was playing, even though many of us were rooting for Team USA.”

Rockwell has to stay in incredible shape to remain qualified to referee at the FIFA and Major League Soccer level. At right, he enjoys taking in a World Cup match in Brazil as a fan.
In the WORLD

Ramblin’ Wrecks generating buzz beyond the Atlanta campus.

Dollars & Sense: Ken Muncy

Ken Muncy, IE 82, will be the first to tell you that he’s no designer. But he knows far more than most about a critical step in the design process—one that innovators often overlook—and that’s how to protect your design work with a patent. As a principal at renowned intellectual property law firm Muncy, Geissler, Olds & Lowe in Fairfax, Va., Muncy specializes in design patent prosecution—which we were surprised to learn has nothing to do with litigation. In our interview with Muncy, he sets the Alumni Magazine straight on what the term means and why patents are so important for designers.

How did you become a patent attorney after earning your bachelor’s degree in industrial engineering from Tech?

Just by chance. I had no idea about patents when I was at Tech. I interviewed with General Motors at the job placement center during my senior year, and the U.S. Patent and Trademark Office also happened to have an opening for an interview that day. I interviewed, was given a job offer and accepted because I thought the Washington, D.C., area would be a nice place to live. While working for the government during the day, I went to law school at night and got my law degree. Working as an examiner was some of the best training I could have received prior to becoming a patent attorney.

What do you do as a patent attorney and principal at your law firm?

As a major part of my job, I draft and obtain utility and design patents, as well as trademarks, for my clients. I also have to advise them on how to maximize their protection and to avoid infringing on the rights of others. Not only do I get to use my technical and writing skills from Tech when handling applications, but I also use sales and marketing techniques to obtain clients, and management skills in the daily operation of my firm. While my firm was founded only eight years ago, we are one of the top five firms in the country for design patents and have become the 31st-ranked firm in the country for obtaining utility patents, according to Intellectual Property Today. I work with clients throughout the world.

What exactly is patent prosecution and how is it different than patent litigation?

Patent prosecution obtains patents for clients while patent litigation involves the enforcement of their patent rights. While I have been exposed to both sides of the business, I like the patent prosecution area. Every day you have a new puzzle to solve. Whether it is how to distinguish your client’s invention from the prior art or some other problem, there is something new every day. This keeps the job interesting.

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How important is it for designers to protect their work legally?
Obtaining protection is critical because designers put so much time and expense into their work. Otherwise, competitors can be free to copy their endeavors. People sometimes do not recognize the scope of protection available. I have filed design patents for type fonts, fabric patterns, computer icons and LED designs. A design does not have to be beautiful or a work of art in order to qualify for protection. It simply needs to be a new, original and ornamental design embodied in or applied to an article of manufacture.

What do designers need to do to protect their work?
At first, designers should keep their designs confidential until a patent application has been filed. The right to file in countries outside the U.S. can be lost if an invention is released to the public before some initial filing. Moreover, the U.S. has certain bars that will arise over time, preventing a designer from obtaining patent protection after the first public disclosure, use, sale, offer for sale or other public release of the invention. A knowledgeable patent attorney can help guide the inventor through the rather complex patenting process. While it is possible for an individual to obtain a patent, an inexperienced person could be overwhelmed or make unnecessary mistakes during the patenting process.

What types of designs can be protected?
Design patents can protect a wide variety of items. For example, I have filed for a “Christmas tree” built from whiskey barrels, a vending machine with a wave-front and even macaroni. However, objects that are hidden in use or whose shape is dictated solely by their function may not be patentable. Such instances rarely occur. Furthermore, if an article is a copy of an already existing, known product, it would not be patentable.

Are there any common misconceptions or myths about design patents?
The biggest myth is that design patents are not worth the effort. However, after the Apple Inc. v. Samsung Elec. initial verdict of more than $1 billion, there has been a marked increase in design patent awareness. This verdict was based, in part, on infringement of some of Apple’s design patents.

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Georgia Tech researchers stand at the nexus of wearable computing design, where the brains that go into such high-powered clothing and accessories count at least as much as their good looks.

---fig. 1---

Electronic Textile Interface [Jacket]

Fashion and computing: The two don’t typically mix, but electronic textile interfaces bring them together in a very practical way. They employ conductive embroidery sewn onto fabric to control electronic devices: Imagine changing the song on your iPod by touching your jacket sleeve. Using traditional fabric swatch books as a model, Tech researcher Clint Zeagier can demonstrate to fashion designers all the cool things these interfaces can do.
It’s been dubbed the “Year of Wearable Technology,” with 2014 marking the tipping point for computer-powered apparel and accessories in the marketplace. Scores of finally viable devices have made it into the headlines and into consumers’ wardrobes, as eyeglasses, wristwatches, gloves and other articles of clothing have increasingly been called to perform double-duty—serving not only as trendy fashion statements, but also the ultimate in connected functionality.

Not surprisingly, Georgia Tech faculty, researchers and students are helping to lead the way in wearable computing. In fact, they rank among the most experienced in the growing field, having collaboratively studied and developed wearable technology for more than 20 years. To capitalize on this expertise amid the recent buzz and cement its commitment to such research, the Institute recently formed the Wearable Computing Center. The Center aims to continue to bring together top computer scientists, engineers, psychologists, fashion designers and other experts across campus to keep Tech at the industry’s forefront.

Innovations such as Google Glass—which a Tech professor helped to develop—may seem like fads, but the reality is they’re here to stay. “This is a really exciting time for this type of technology and there’s just so much research to do,” says Center Co-Director Maribeth Gandy, CE 98, MS CS 99. “It’s a good time for Georgia Tech to expand our efforts in this realm.”

The Wearable Computing Center will also straddle the line between academia and the private sector, providing consulting services to businesses interested in taking advantage of the latest technologies. Center Co-Director Peter Presti, CS 96, MS CS 06, says Tech researchers have skills and experience that few other universities can offer. “When companies come to us, they come from a background of this is new and exciting and we’ve never heard this before,” Presti says. “Well, of course, we at Tech have been in the field for decades.”

The applications for wearable computing technology aren’t limited to trendy consumer gadgetry. For example, modern, large-scale farming operations use a lot of high-tech machinery such as aerial drones, Gandy says. “Ag companies are often making real-time decisions on what to do in the field,” she says. “Wearable computers give workers a hands free, always-on interface to stay connected to the ecosystem of technology they’re using.”

Presti adds: “Georgia Tech truly stands at the nexus of this progression in wearable computing as it moves forward.”

Read on to find out more about some of the Institute’s top researchers in the field and about their groundbreaking wearable technology.
A Brief Timeline of Wearable Computers

1961 MIT Professor Edward Thorp designs a device that is often recognized as the first wearable computer. Thorp used this simple computer, which was about the size of a pack of cigarettes, to improve his odds on the roulette wheel. Thorp is best known for writing “Beat the Dealer,” the best-selling Blackjack card-counting manual.

1975 Pulsar introduces the first calculator watch. Several companies manufactured versions of the digital watch, which featured calculator keypads, but it was the Casio model that became the ubiquitous accessory of the 1980s.

1979 A young Steve Mann, often called the “father of wearable computing,” designs a computerized welding mask. The idea was to use video cameras, displays and computers to modify what a welder sees in real time. The device included large rabbit-ear antennas worn on his head, but it was capable of wireless communication. Mann went on to create many more important advances in the wearable computing field. Today, he wears the Digital Eye Glass of his own creation at all times. In fact, it is literally attached to his head.

2000 The first mobile phone with Bluetooth technology hits the market. Headsets using Bluetooth connect wirelessly to mobile phones so you can talk without having to hold the phone up to your face.

2007 The FitBit is created. FitBits are worn around the wrist like a watch and utilize sensors and wireless technology to track fitness activity. These wearable devices allow you to know exactly how many steps you’ve taken, what distance you’ve covered, and how many calories you’ve burned. In case you were wondering.

2013 Google Glass is released for beta testing. This wearable device, which features a heads-up display mounted on a pair of eyeglasses, does pretty much everything your smart phone does, but there’s no device to hold onto. Glass projects everything directly into your field of vision so there’s no screen to look at. A consumer version of Google Glass is expected in late 2014.

AHEAD OF HIS TIME

Tech Professor Thad Starner was about 20 years ahead of his time. In 1993, just as most households finally accepted that desktop PCs were a worthwhile investment, Starner was already wearing a portable computer he designed himself. A student at MIT at the time, Starner’s motivation to create this unconventional computer was not fame or fortune. He simply wanted to create a way to better retain the complex material from his class lectures.

He found that when he brought his laptop computer to class, he was able to take good notes—but he couldn’t look up from his screen while he was typing. If he instead focused on listening to the professor, he would understand the day’s lesson, but have trouble recalling the information later.

So he designed a wearable computer that would allow him to do both. With an eye-level display, he could see both the classroom blackboard and the computer display in his field of vision. From the time he first completed this precursor to Google Glass, Starner was almost never without his personal wearable computer.

In its earliest incarnation, the display attached to his eyeglasses obscured most of one eye from view. He carried the equipment in a heavy shoulder bag strapped around his chest, and typed on a one-handed keyboard called a Twiddler.
Needless to say, he often attracted attention, especially from his peers at computing conferences.

On one such occasion in 1998, two guys asked Starner if he would give them a demonstration of his mobile computer. Their names were Larry Page and Sergey Brin, and they told him they were starting a new search engine. Using his wearable computer, Starner typed up some quick notes about their conversation and got their email addresses to stay in touch.

To this day, Starner uses his wearable computer to take meticulous notes on everything from professional engagements to casual conversations. He has about 20 years of such notes stored on the machine, and he's devised a cataloguing system that allows him to easily call up relevant notes that will add to his conversations.

The notes from that encounter proved to be especially useful. That new search engine? It's the juggernaut we know today as Google.

"That's one personal, early example of wearable computing being pretty important and pretty life-changing," says Starner, who joined the faculty of Tech's College of Computing in 1999.

In 2010, Starner reconnected with the guys from Google, and they decided the time was right to start developing a heads-up display for the mass consumer market. A heads-up display is a device that transparently projects images or information directly onto a user's field of vision, so it can be seen layered on top of the background. Starner partnered with Google as a technical lead on Project Glass.

Think about Starner's early wearable computer. Most people wouldn't be too interested in lugging around a 5-pound sack of electronics, regardless of what cool things it could do. And the head-mounted display? Forget it, Starner says. At the end of the 20th century, many people were still not convinced of the need to own a personal computer, much less wear one on their face.

"If you look at how we were using these systems in the 1990s, it's how people are using their cellphones today," Starner says. "There was no such thing as a Palm Pilot, there was no such thing as a smartphone. Laptops were barely known."

But a lot has changed since the '90s.

People eventually embraced mobile devices that allowed them to send text messages, check emails, update their calendars, find destinations with GPS navigation, listen to music and much more. The technology itself has also improved in many ways—including both affordability and sturdiness—making the idea of wearable computers more realistic for lots of consumers.

In addition, batteries have gotten lighter and last longer, cloud computing makes data storage easier, and Wi-Fi and Bluetooth make wireless devices much faster and more convenient. All of these technologies are somehow packed into devices like Google Glass, says Starner, which is no heavier than your average pair of sunglasses.

"The infrastructure caught up with what we were trying to do," Starner says.

For Starner, wearable computing is an exercise in minimalism. Google Glass augments reality, rather than distracts from it, providing assistance to the user while they engage in other tasks. Say, for example, you're traveling and want to find the nearest coffee shop. Rather than stopping to take your smartphone out of your pocket to consult a navigation app, you could keep walking and have Glass display directions to the nearest shop.

In fig. 3 -

CHAT

We know dolphins are smart. But it's been difficult to fully understand them. Cetacean Hearing Augmentation & Telemetry, or CHAT, is an underwater wearable computer, developed by Tech students and faculty including Peter Presti and Thad Starner, that allows marine biologists to record and transmit whistles for two-way communication experiments with our mammalian friends.
“Any fancy interfaces, fancy graphics, you want to get out of the way,” Starner says. “So the device becomes an extension of yourself.”

By having the computer on your body, you’re able to continue about your business and find the information you need faster, he says. “It shortens the time between your intention to do something and your first action,” Starner says.

**EVEN A SHIRT CAN BE SMART**

**Starner was not the only** Georgia Tech professor making waves in the wearable technology field in the late 1990s.

Sundaresan Jayaraman, a professor of materials science and engineering, changed the way people looked at fabrics when he unveiled a prototype of his “wearable motherboard” smart shirt to Peter Jennings on ABC’s *World News Tonight* in 1997. From there, he appeared on CNN, BBC and Discovery Channel. The high-tech undershirt was featured by *Newsweek* magazine as one of “10 Inventions That Will Change the World.” *Life* magazine highlighted the smart shirt as one of its “Medical Miracles for the Next Millennium.” And *Time* magazine named the Smart Shirt one of the “Best Inventions of the Year for 2001.”

All of this buzz centered on the radical idea that textiles could be a platform for electronics.

The smart shirt project began at Tech as DARPA-funded research to investigate ways to minimize casualties for soldiers on the battlefield. Jayaraman and his team came up with a shirt, made using a high-tech loom, woven with optical and conducting fibers throughout that would be able to read the wearer’s vital signs and detect injuries, such as bullet wounds, if the fibers were broken.

In developing the technology, Jayaraman and colleague Sungmee Park, MS TE 95, wove electronic fibers into fabric to create a shirt capable of many different functions. It was dubbed the wearable motherboard because, like a computer’s motherboard, you could switch out the sensors and devices to perform different functions.

It was the first time anything like it had ever been created, and this early prototype is now housed at the Smithsonian.

The wearable motherboard, which looked something like an undershirt made of papyrus fibers and glowsticks (though still surprisingly soft), proudly boasts its Georgia Tech genesis. Sewn on the right breast is a patch of the official school seal. On the left, a small likeness of the Yellow Jacket mascot, Buzz.

**Jayaraman still envisions a world** of possibilities for the wearable motherboard. In the nearly 20 years since that first media blitz, he has continued his research and developed the technology in his lab at Tech.

In 2000, Georgia Tech licensed the technology to a startup company that planned to create items for the consumer market, but commercialization never got off the ground. Last year, Tech was able to reacquire the license, and Jayaraman says plans are underway to work with a new company to get products using the technology out on the market.
With its versatile nature, Jayaraman envisions many different uses for the wearable technology. It could be used by athletes during training to record performance, by the medical industry to track the health of patients, and by firefighters to let them know when temperatures become lethal.

“It has applications throughout the continuum of life,” Jayaraman says. “The possibilities are really endless. It’s all driven by need.”

One of the first products he hopes will be available for consumers is a one-piece baby outfit. The baby jumpsuit would be made of soft cotton and feel no different than any other baby clothes, but it would be equipped with sensors that could alert parents if an infant stops breathing. In that respect, it could be a powerful tool to combat Sudden Infant Death Syndrome, better known as SIDS, Jayaraman says.

Following the initial publicity surrounding his technology, Jayaraman was contacted by heartbroken mothers who had lost babies to SIDS. They wanted to know how they could get his baby clothes to prevent that tragedy from ever happening again. He says it was very difficult for him to know that he had designed something that could potentially save lives but couldn’t legally make it available to the public. The cause remains close to his heart, and Jayaraman says he is optimistic that this new commercial endeavor will be successful.

Jayaraman says one of the reasons he loves textiles is because they are not only functional, but beautiful. And he firmly believes textiles will be an important part of the future of wearable computing.

“When you think of the word ‘wearable,’ the first thing that comes to your mind is clothing,” Jayaraman says. “When you think about textiles, it’s the ultimate framework or infrastructure you have. You’ve got the fluidity of art, and the rigor of science. When those two come together, it’s pure joy.”

**MAKING WEARABLE TECH FASHIONABLE**

As an undergraduate student at Georgia Tech, Clint Zeagler, ID 04, was blown away by the wearable motherboard designed by his professor, Dr. Jayaraman. The smart shirt combined two things he was passionate about: fashion and human-centered computing.

“That’s part of the reason I got so excited about wearable technology,” Zeagler says.

Zeagler, now a researcher at Tech himself, works to bridge the intersection of art and science. His research revolves around what he calls on-body interfaces, many of which are textile-based.

One of his major projects is conductive-thread embroidery: a pattern embroidered onto a garment, like a jacket sleeve, which can be touched to control electronics.

“If I’m walking down the street, instead of having to pull out my phone to answer a telephone call or hang up on a telephone call or change a song, I can reach and touch the embroidery on my sleeve and control those things,” Zeagler says. “And because it’s embroidered, it’s raised up and I can feel it without having to look at it directly.”

What separates Zeagler from many of his colleagues in the computing world is that he has some serious fashion credentials.

After graduating from Tech with a bachelor’s degree in industrial design, Zeagler headed to the fashion capital of Milan, Italy, to study at Domus Academy, where he earned his master’s degree in fashion design. Back in Atlanta, he started his own clothing line, Pecan Pie Couture, selling organic women’s fashion T-shirts.

He’s a passionate proponent of wearable technology and works to emphasize the “wearable” part as essential to the success of the field. “Part of my goal is that I love the stuff that the craft movement is doing and the DIY enthusiasts are doing with wearable electronics,” Zeagler says. “Part of my goal is to see real mass-market applications. And to do that, you have to find a way to explain your story to the fashion designers and the fashion business engine.”

Fashion designers go to trade shows and get fabric swatch books with samples of different patterns and textures that they can take back to their studios and use for design inspiration. Zeagler says it’s

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**FIDO**

This doggy acronym stands for “Facilitating Interactions for Dogs with Occupations.”

Wearable technology for dogs? Yep. Working dogs, like those that sniff bombs or assist people with disabilities, are limited by how much they can communicate with humans. So Tech researchers created sensors for a working dog’s vest that the dog could use with biting, tugging and nose gestures to better communicate with their handlers.
difficult to introduce on-body interfaces to fashion designers in the same way that you would with traditional fabrics.

Showing up to a fashion design studio toting a piece of fabric with a bunch of wires hacked onto a breadboard just wouldn’t cut it, he says. Even if it worked beautifully, it would look awkward and intimidating to someone who isn’t familiar with computing.

Zeagler created an electronic textile interface swatch book as an easy, accessible way to introduce and demonstrate wearable technology to fashion designers. “We wrapped it up and packaged it so it was an easy plug-and-play system that hooked up to a laptop. You could see the swatch, play with it, and then plug in another one,” he says.

Zeagler likes wearable technology because it encompasses a mix of function and expression.

“Anything that we put on our bodies, that we wear, we make a choice to do that and it says something about ourselves,” he says. “Inevitably there’s a fashion element or a style element to anything we decide to wear, even if it’s an anti-fashion statement.”

Zeagler is one of the Tech researchers, along with co-directors Gandy and Presti, working to help kickstart the new Wearable Computing Center. He says that mix of influences in wearable technology—from design to computing to psychology to business—makes it an area that’s perfectly suited for multidisciplinary collaboration.

“Lots of people come to Georgia Tech because wearables are so in the news right now and because we have such close ties to the wearable community,” Zeagler says. “The hope is that the Wearable Computing Center will be a hub for collaborative projects across campus that have to do with wearable computing.”

Center co-directors Gandy and Presti say it may seem as if the Center sprang from the recent popularity in wearable technology, but again stress that it’s actually rooted in the many years of research and development that’s placed Georgia Tech on the cutting edge of the movement.

With Google Glass, wearable computing now has a very recognizable poster child, and one of Tech’s own played a huge role in its development. “Just having a large, respected company put their stamp of approval on wearable technology is very impactful,” Gandy says.

There are other companies out there working on head-mounted displays, but Google is the largest and best recognized. Gandy says before Google introduced Glass, it was harder to get people interested in considering wearable technology.

“When I would show people demonstrations on a head-mounted display, they would say, ‘This is kind of weird, I don’t know that I would want to wear this,’” Gandy says. “It was Google saying ‘It’s OK, this is the future.’”

Another big-name company getting involved in wearable computing is Facebook.

In March, the social media giant purchased Oculus VR, the maker of the Oculus Rift virtual reality headset, for $2 billion.

In a memo posted on the social media site, Facebook CEO Mark Zuckerberg explained his interest in acquiring the seemingly unrelated company. Oculus Rift was developed as a headset to play immersive, virtual reality video games and has been very popular with game developers even though it has yet to hit the consumer market. Zuckerberg says under the Facebook flag, Oculus will continue as a gaming platform but will eventually be expanded to include new social applications—Zuckerberg’s wheelhouse.

“After games, we’re going to make Oculus a platform for many other experiences,” Zuckerberg wrote in his March 25 memo. Imagine enjoying a court-side seat at a game, studying in a classroom of students and teachers all over the world or consulting with a doctor face-to-face—just by putting on goggles in your home. This is really a new communication platform. By feeling truly present, you can share unbounded spaces and experiences with the people in your life. ... One day, we believe this kind of immersive, augmented reality will become a part of daily life for billions of people.”

With the purchase of Oculus, Zuckerberg demonstrated his belief that wearable technology is the next frontier. “Virtual reality was once the dream of science fiction. But the Internet was also once a dream, and so were computers and smartphones,” Zuckerberg wrote.

Researchers don’t know for sure where the future of wearable technology is headed. But most agree that regardless of what incarnation it will take, wearable technology will hold a place in our lives.

Tech’s Presti says that while it’s fascinating to try to imagine it, it’s almost impossible at this point to know how the technology will evolve. “Trying to predict where wearable computing will go in the next 10 to 15 years is like forecasting in 1995 where the World Wide Web would go,” Presti says. “Regardless, we at Tech are excited to play a major part in its future.”

-fig. 6-

Wearable Computing Gloves

It sounds too good to be true: Put on a pair of gloves, sit back and now you can play the piano. Or read Braille.

Tiny vibrating motors inside the gloves developed at Tech teach motor skills through a technique called passive haptic learning.
Form—and function—both play a major role in the work of seven of Tech’s top alumni designers.

An engineering maestro who orchestrates technical innovation for one of the world’s most iconic automakers. An Internet interaction expert who helps make Google go. A much-beloved interior designer dedicated to bringing affordable style to the masses. These are just a few examples of Georgia Tech alumni making an indelible impact in the world of design. Turn the page to read their stories and marvel at some of their most recent work.
Cimatti supervises a team of engineers and designers charged with developing new vehicle architecture and technologies upon which the Ferrari business plan revolves. “We investigate high-level, strategic directions, as well as detail decisions in terms of performance specifications, space allocations and design solutions,” Cimatti says.

His body of engineering and design work is astounding: Cimatti explored a pronounced rear-biased weight distribution with a mid-front engine, transaxle layout in the 2004 Ferrari 612 Scaglietti; developed a new dual-clutch transmission, suspension geometries and a retractable hard-top for the 2008 California; patented Ferrari’s first all-wheel-drive transmission on the 2011 FF; and pushed physics-based design integration to the extremes on the radical, hybrid 2013 LaFerrari.

Two fundamental principles drive Cimatti’s approach to automotive design. “The first is to explore and generate feasible ideas for functional and performance aspects that may be obtained by basic physics such as weight, weight distribution, position of center of gravity, inertia properties, aerodynamics and the like,” he says. “And to that end, I try to minimize parts count and size as much as possible.”

The second is perhaps even more important: to maximize the interaction between human and machine. “Vehicle control should be natural and enjoyable, the feedback from vehicle to occupants appreciable, and life on board our vehicles a remarkable experience,” Cimatti says.

As you can imagine, it takes a tremendous amount of effort to bring a Ferrari from original concept all the way to dealers’ showrooms. And that’s why such work takes not only a strong design team, but also a close relationship with other design and production partners in the business, Cimatti says.

“My team devotes a considerable portion of its time to hands-on engineering design work and preliminary calculations,” he says. “At later stages, when single vehicle model development starts, our work becomes the engineering input on the automobile’s aesthetics, and the technical feasibility of the desired styling. We also coordinate all vehicle technical specifications and development right up to production launch.”
“...is eclectic and supports the human experience. I'm always telling my viewers and clients that their homes' design should reflect them, their unique experiences and their personalities. No one should pigeonhole himself as, say, Mid-century Modern. That's too one-dimensional and limiting.”

— VERN YIP, VERN YIP DESIGNS
Vern Yip, MBA 94, M Arch 95
INTERIOR DESIGN, VERN YIP DESIGNS

Bursting into people’s homes on a hugely popular home-improvement show back in 2001, Vern Yip quickly became one of the world’s most famous—and relatable—faces in interior design. “My entire career has been about making design accessible for everyone, and TLC’s Trading Spaces was the first vehicle for sharing my philosophy with a wide audience,” Yip says. “And people really connected with it. I never expected to be a celebrity designer.”

Though such democratization of design was not in vogue among his peers, Yip saw a lot of value in it. “You shouldn’t have to be on the top rung of the socio-economic ladder to be able to afford and enjoy great design,” he says.

Though he’s had several very public vehicles for sharing his expertise and enthusiasm, including later shows such as NBC’s Home Intervention and HGTV’s Design Star and Deserving Design with Vern Yip, the Tech alumnus still runs his own design company in Atlanta. With far-flung business interests, Vern has taken advantage of both his MBA and master’s in architecture from the Institute.

“The most important things I learned during my time at Tech were how to work hard and juggle multiple projects—I’ve never been so tired in my life,” he says. “I was forced to think more critically with the left side of my brain to balance out my right-brain creativity. Today, that’s a necessary balance for my work as both a designer and businessman.”

One of Yip’s latest projects was building his dream home, a Dutch Colonial-style beach house located in a New Urbanist settlement in Florida that embraces a community-centered lifestyle. “It’s the perfect place to raise my two kids, and the perfect place to showcase all the furniture and design items I’ve accumulated over the years and through my travels to 46 different countries,” Yip says. (The house recently was featured on an HGTV special called Live in Vern’s House.)

The award-winning designer also just launched last month a new line of colorful, contemporary fabrics—dubbed Vern Yip For Trend—adding to a long list of product lines and endorsements for companies over the years such as Stainmaster carpet, Moen faucets, Procter and Gamble, Best Buy and others.
When it came time for college, the Alpharetta native took the traditional prescription for a career in medicine. “The plan was to study biomedical engineering at Tech, move onto medical school, become a doctor and see where that took me,” Moore says. However, while working on a biomechanics class project at Tech—in which she designed a highly accurate blood pressure measurement device—she fell even harder in love with design and decided to focus solely on it.

Today Moore works at K2M Holdings, a global medical device company, where she serves as a project engineer and oversees the design of a diverse range of complex spinal implants and the instrumentation used to implant them. She has helped develop products aimed to alleviate pain and improve the quality of life for a wide range of patients, ranging from those suffering from adolescent scoliosis (rare and risky) to vertebral degeneration (fairly common).

“When designing a new implant, I have to research the intellectual property that is out there, and also research what doesn’t exist yet,” Moore says. “My fellow designers and I work closely with a board of surgical advisers, and together we look for ways to make our implants—and the surgeries themselves—better.”

In that regard, Moore has to serve two very different clients: the patients themselves, and the physicians who perform the surgeries.

“We strive to design the best instrumentation in the industry,” she says. “We work hard to make it easy for doctors to implant the devices quickly and efficiently.”

Doctors also demand form as well as function from the implants, whether they’re interbodies (that hold open vertebrae) or cervical plates. “Aesthetics do play a fairly large role in their design,” Moore says. “Physicians want implants that are sleek and attractive, and that look and feel high quality.”

That’s not the only challenge in developing the devices. Like prescription drugs, spinal implants have to pass rigorous FDA testing. “It’s a complex process that takes a good amount of time,” Moore says. Another challenge is designing for scale. “Most implants will be mass produced in a variety of sizes, so they have to work and be cost effective throughout while maintaining the highest quality.”
Jennifer Moore, BME 05, K2 m

"...is safely and conscientiously engineered. When I design a medical device or implant, I always do a gut check. 'Would this be something I'd be willing to use on my own grandmother?' That's been my guiding principle for the past 8 years as a spinal implant designer. Good design has to be safely and conscientiously engineered."

— Jennifer Moore, BME 05, K2 m
“... goes beyond the aesthetic surface, and beyond what looks good on paper. A well-designed toy will appeal to the eye with attractive colors and interesting shapes, as well as to the touch with quality materials and a satisfying weight. But it also has to be feasible to engineer and manufacture, and viable to market and sell. There is no innovation without execution. Bad toy design happens when you skip a step in the process, or when you don’t understand customers’ needs, or when you—worst case-scenario—fail to make it completely safe.” – BRAD REESE, KIDS II
Brad Reese, ID 04

TOY DESIGNER, KIDS II

Brad Reese has been balancing his inner child with his inner designer his whole life. As a kid, Reese was obsessed with model building, doodling and creating things, and he even took an early architecture class just so he could learn how to construct intricate balsa-wood structures.

Fast forward a few decades, and Reese is still at it. Today the Tech grad works as director of industrial design for Kids II, an Atlanta-based manufacturer of infant toys and gear. He currently manages a team of designers for some of his company’s notable brands, including Bright Starts and Baby Einstein, but he spent his first 10 years at Kids II as a toy designer himself.

“I’m not going to kid you, making toys for a living is a lot of fun,” Reese says. “But it’s more challenging than most people realize. For one, it’s highly regulated in terms of safety, and closely scrutinized by not only government agencies, but also retailers, parents and child safety advocates.”

Reese says the toy industry is also extremely competitive and fast-paced. “Unlike some industries where a company is expected to introduce only a couple new products a year, we’re designing and putting dozens of new products into the marketplace annually,” he says.

Perhaps the biggest challenge of his job is designing for parents. “It’s especially critical to understand parents’ motivations and tastes, because they’re the ones actually buying the toys,” he says. “Unfortunately, toy aisles bombard them (and their kids) with sensory overload. You have to have an attractive color scheme, unique appealing product forms and good packaging or you might get skipped over.

“As you can imagine, we conduct a lot of research—focus groups, shop-alongs, in-home play sessions—to ensure we’re making toys that both kids and parents are happy with,” Reese says. For the child, it’s mainly about the playability, entertainment and learning they get from the toy, he says. For the parent, in addition to safety it’s also largely about ease of use.

“Case in point: a Bright Start crib mobile I helped design featured a new way to attach it to any size crib,” Reese says. “That made the mobile very portable and popular with the adults who had to install it.”
“Alongside some extraordinary teammates, I spent 13 years designing, building and delivering hundreds of custom devices, products and furniture pieces to help people with disabilities,” Harp says. “As you can imagine, the work was very fulfilling because I could directly see the impact of my work on individuals’ lives.”

In 2001, Harp transferred to the College of Architecture’s newest research center and helped set up the Advanced Wood Products Laboratory (now the Digital Fabrication Lab), where he taught wood technology and furniture design to budding architects and industrial designers for 10 additional years. “I felt like a kid in a candy store because we had access to one of the most amazing wood shops in the world.”

All that time teaching and helping others make furniture finally inspired Harp to step away from Tech and start his own custom furniture business in 2010. “I never planned to be a furniture designer,” he says. “It was mostly a progression of happenstance and opportunity. But once I founded my company, I did so with the goal of creating custom pieces that hadn’t ever been built before.”

Harp works with clients one-on-one to build exactly what they want. “My job is to use my experience and skills—often cleverly—to deliver the functionality my clients want while matching their unique aesthetics,” he says. “For example, I crafted a one-of-a-kind ping-pong table made of padauk and quartersawn white oak (pictured right), that when not being used, could double as a formal dining table.

“Custom projects like this are an incredible challenge to me, to make sure they work well and look good, as well as being incredibly fun.”

It took Alan Harp a lot longer to “get out” of Tech than most graduates—not because he struggled with his coursework, but because after finishing his bachelor’s degree, he stayed put, taking a job as a designer for the College of Architecture’s Center for Assistive Technology and Environmental Access (CATEA).
Before she enrolled as a graduate student at Tech, Rebecca Rolfe was already an accomplished Web designer at CNN.com, where she prepared artwork for stories, made charts and graphics for the daily news desk, and even helped out with a complete site redesign in 2009. “At that point in my career, I was focused primarily on direct storytelling and visual design,” Rolfe says.

Her master’s degree in digital media (and an internship at the company) helped land her a permanent, plum job at Google as an interaction designer for its Chrome web browser. However, it’s a completely different role for Rolfe. “A visual designer works out the style—the type, the colors, the sizing,” she says. “Meanwhile, an interaction designer figures out where, for example, the print button goes on the page if it shows up on mobile or tablet devices, what dialog pop-ups you get when you click the button, and how the overall flow works so that you can print your page effortlessly.”

When Rolfe was hired for the Chrome team she wasn’t exactly sure how she’d stay busy. “If you use the Chrome browser you’ll see there’s very little obvious design going on,” she says. “But that’s what makes it magical. It only feels like there’s not much to design—there’s actually quite a lot there and we just don’t notice it. It aims to be minimal, to let you get to enjoying the Web.”

The challenge for Rolfe is to integrate all the Web browser features users care about while keeping Chrome true to its slick and sleek origins. “It’s an interesting, ongoing problem to solve,” she says.

Rolfe has learned a lot about design in her relatively short time at Google. “‘Design for the user and all else will follow’ is the overarching philosophy here,” Rolfe says. “If we’re thinking of the user first, then we’re doing the right thing.”

In addition, she finds it encouraging to work for a company that embraces change. “Google isn’t afraid to dismantle something and rebuild it from the ground up for the sake of creating something people love,” Rolfe says. “I could be more daring in my design, to be honest. I’m a good interaction designer because I try to find the clearest path. But Google forces me to ‘think 10x,’ where we don’t aim to increment little by little, but rather think how what we’re working on can be 10 times more awesome.”

Rebecca Rolfe, MS DM 13

INTERACTION DESIGNER, GOOGLE CHROME
Residential communities and commercial buildings. Casinos and hotels. Exhibits and corporate suites. Wayfinding signage. Even sculptures. Throughout his long, eclectic career, Jan Lorenc has helped design them all.

Lorenc leads a purposefully small, 10-person design firm with fellow Tech alumnus Chung Yuol Yoo, ID 87, MS 97, that’s headquartered in downtown Roswell, Ga., but has far-ranging impact. Lorenc+Yoo Design’s boundary-breaking expertise has in recent years led to major projects in China, Dubai and Europe.

“I originally focused on environmental graphics, but I’ve always been open to the interplay of a variety of design disciplines,” Lorenc says. “Being able to work on different types of design keeps things fun and exciting, and it’s helped take us around the world.”

A good example of Lorenc’s unique—and rare—stature as a designer can be seen first-hand in the Opalus mixed-use retail and residential community in Guangzhou, China, which his firm has been working on for the past several years. “Typically a lot of design disciplines will be called to work on a project of this size and scope,” Lorenc says. “And it can often turn out to be hodgepodge. Lorenc+Yoo Design offers an orchestrated vision for projects that brings everything together seamlessly, including buildings, interiors, the landscape and what we call architectural jewelry.”

The secret weapon in Lorenc’s arsenal is his commitment to incorporating storytelling into his designs. “In the case of Opalus, we created a visual fairy tale of good fortune and magic that was woven into the site, with fairies and art deco touches used throughout,” he says. “Our Chinese partners and their customers really get into it. But we’ve done similar storytelling in setting themes for casinos and exhibits in the U.S. and other regions.”

Lorenc believes that tons of careful research remains the key to pulling off visual storytelling of this scope. “When we start a project, we spend a lot of time learning as much as we can about the context,” he says. “We immerse ourselves in the design problem so that we develop a high-level approach. Inevitably, some of what we execute springs naturally from the native culture and environment, some of it involves inventing something new, and most of it spreads across different areas of design.”
To make video games, you must study them. And to study video games, you must make them. This philosophy puts Georgia Tech’s relatively new and growing Game Studio straight onto the leaderboard. Not only does the Studio give students a chance to develop their own games, but also the opportunity to conduct in-depth research and imagine what gaming might look like in the future—whether it involves adventures in virtual reality or the “gamification” of everyday human life.
Make no mistake: Mass-market video games are big money. Last September, *Grand Theft Auto V*, the latest in the popular franchise from Rockstar Games, sold $800 million worldwide in 24 hours—the most successful launch of any entertainment property ever. That includes movies, records, you name it. For comparison, it took four weekends for this summer’s Transformers movie to hit $800 million. To put it simply, video game revenues dwarf the box office and most other forms of entertainment.

Based on the immensity and longevity of the gaming industry, it makes perfect sense for two of the industry’s leading researchers to set up shop at one of the world’s top research universities and try to push the medium forward. And that’s exactly what Bogost and MacIntyre aim to do.

“We’re really interested in stopping and thinking about where gaming is today,” Bogost says. “It’s important to look back historically at where gaming has come from, and then look forward to see where it might go in the future. All kinds of new opportunities exist for video games.”

This combination of theory and practice is something that Bogost and MacIntyre are trying to bring into the studio environment. “It’s very, very, very different than the vast majority of activities that take place at an institution like Georgia Tech,” Bogost says.

And it’s an approach Bogost and others had back in 2005 when they co-wrote an article for the *International Digital Media and Arts Journal* titled “Asking What Is Possible: The Georgia Tech Approach to Game Research and Education.” University-based game development programs, he and his co-authors wrote, tend to focus on two separate activities: game production, which has traditionally fed the industry with workers who have the skills and understanding needed to bring a game to market, and game studies programs, which analyze the gaming environment in a research-oriented and theoretical way.

Georgia Tech’s burgeoning Game Studio is emerging as a leading hub of video game research and development under the direction of professors Ian Bogost and Blair MacIntyre. The dynamic duo started the Studio two years ago to explore the myriad ways gaming can be a critical tool for teaching and training, in addition to its existing role as a popular mode of entertainment.

*Ian Bogost* is the Ivan Allen College Distinguished Chair in Media Studies and a professor of interactive computing at Tech, where he also holds an appointment in the Scheller College of Business. In addition, he is founding partner at Persuasive Games LLC, an independent game studio, and a contributing editor at *The Atlantic*.
Georgia Tech would be different, they wrote: “We at Georgia Tech want to challenge both of these categories. ... If the Game Production programs rally around the cry ‘You play games, now learn to make them’; and if the Game Studies programs declare, ‘You play games, now learn to study them,’ then we might respond, ‘You must make games to study them, and you must study games to make them.’”

It would take seven more years, however, for the Game Studio to get off the ground. In 2012, Georgia Tech alumnus and generous benefactor Chris Klaus, Cls 96, suggested to the provost that his alma mater might want to support more student game creation. After all, the University of Southern California and New York University both have successful game design schools. But neither is a top-tier research university with a pool of 21,000-plus technically adept students to draw upon.

“We have awesome students,” says MacIntyre, the Studio’s co-director. “Because they’re so good technically, they’re unafraid to try things that might be too hard for most others, those who are more into the storytelling or look and feel, for instance.”

GT students [l to r] Miranda Bradley, Paco Swift, Kyle Blevins and A.J. Kolenc discuss a Virtual Reality game prototype with Bogost. Other members of the Studio this past year include Chris DeLeon, Matthew Guzdial, Adam Le Doux, Marc Huet, Sebastian Monroy, Rose Peng, Daniel Xiao and Bobby Schweizer.
Given the intersection of technical expertise, engineering and art that make up the video game creative process, MacIntyre compares programming to painting. If you’re trying to paint, but you’re not technically skilled, you’ll focus on the brush strokes and the thickness of the paint. You’ll worry whether you’re getting the sky just the right shade of blue. You’ll lose sight of what you’re trying to create.

“If you’re still not able to make the paintbrush do what you want,” he says, “then it’s hard to paint.”

MacIntyre adds that because GT has such institutional expertise in programming and problem solving, the programming—the digital paintbrush, as it were—doesn’t get in the way. “Because the students are so technically adept, they can explore a different kind of collection of games, and they can do it much more rapidly, so it lets us do this kind of rapid prototyping, new prototypes every week.”

Bogost agrees. “That mentality, that sort of engineer’s mentality, is something that’s uniquely present at a place like Georgia Tech,” he says. “Our students are particularly open and open-minded about solving problems, which is one of the things that we would like to see more of in our games do.”

Current students and alumni working in the video game industry agree that Tech’s approach to rapidly iterating ideas and problem solving—both engineering traits—are competitive advantages.

The emphasis on completing projects and producing finished products, something that’s commonplace throughout Tech, doesn’t get in the way. “Because the students are so technically adept, they can explore a different kind of collection of games, and they can do it much more rapidly, so it lets us do this kind of rapid prototyping, new prototypes every week.”

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fall, games have yet to secure a permanent position as a sober and important mode of communication. There’s still a faint stigma, a whiff of frivolousness, attached to playing computer games—much less researching them—at a publicly supported university. That can make game research an uphill battle at times.

“There’s definitely a stigma,” Bogost says. “And what’s weirder about the stigma is that today more people play computer games than ever have before.” The difference? They don’t self-identify as “gamers” like the kids holed up with Halo on the Xbox or the World of Warcraft obsessive, he says.

“It’s like anything else in my life,” Bogost says. “I’m not a magazine-reader or a film-goer as my primary identity, but those are things that I do.”

Such criticisms are nothing new. Electricity and telephones were railed against in the journal Nature in 1889. The printing press was an upstart evil to a 15th century abbot. And in the dialogue Phaedrus, circa 370 BC, Socrates—Socrates!—warned against the written word: “For this invention will produce forgetfulness in the minds of those who learn to use it, because they will not practice their memory.” Video games as a waste of time and a cause of moral decay among the world’s youth have some good company.

“People are always questioning that kind of stuff,” says Adam LeDoux, 22, one of Bogost’s students who is interning at Microsoft in Seattle. “But for games, if you just look at how much playing games is a part of human life, then it can seem evident why it’s significant. It’s one of the first ways people learn; it’s how you get used to being in the world.”

Bogost is obviously quick to dismiss the idea that games are merely child’s play. But he is also eager to move beyond what he sees as just the technical advancement in graphics and processing power that are the usual signals of advancement with modern gaming. A focus on technical innovation is not the same as innovation in the use and adoption of games and how they fit into our lives, he says.

Which brings us back to the Georgia Tech Game Studio and its mission. To research these other innovations and the gamification of our lives, Bogost thinks that someday, perhaps we’ll find that games have just become part of everyday living. Or perhaps our normal lives will have become games.

“Games are going to become just this ordinary, everyday media experience,” he says. “And that’s actually how we’ll know when we’re successful, when it’s not a big deal to be making games for various purposes.”

From titles that teach us new languages or help us become better people, or those that explore how the political system works or train EMTs to save lives, playing them is a profoundly human experience, Bogost says.

And gaming is something we do from the day we are born almost until the day we literally run out of lives. It makes little difference if the games are played on the playground (which teach teamwork and leadership) on the tabletop (strategy and planning) or on the computer (anything at all).

Researching that—the way games and play can teach us, challenge us and make us think—is certainly worthy of a great research institution like Tech.
Peach State Tour

Tech President G.P. “Bud” Peterson and Queen Bee Val Peterson buzzed through Georgia on a goodwill tour this summer. At their first stop at the Sacred Heart Cultural Center in Augusta, they presided over a reception hosted by the Georgia Tech Alumni Association and Augusta Network, and attended by nearly 200 alumni, students, parents and local officials. Here Bud and Val pose for a photo opp with young alumni Aarthi Murugappan, Bio 12, and Akash Gulati, ChBE 14.
23 Fascinating Facts About Your Alumni Association

Learn little-known details about the Alumni House, our programs and our amazing grads.

1 The Georgia Tech Alumni Association was chartered more than 100 years ago in June 1908. (Think of us being mature and wise—not old!)

2 It was incorporated in 1947 as a not-for-profit organization guided by a volunteer-led alumni board of trustees.

3 Our offices are located in the L. W. “Chip” Robert Jr. Alumni House on North Avenue. The building originally housed the Rockefeller YMCA, which opened in 1912. It cost $75,000 to construct, $50,000 of the money donated by John D. Rockefeller. The building was originally equipped with a bowling alley, billiard and pool rooms, club rooms, a magnificent gymnasium and lounging quarters open to the entire student body.

4 What’s now the Alumni House once contained the offices of several Georgia Tech legends, including John Heisman, George Griffin, Frank Roman and Bobby Dodd.
Alumni Scholarships offered 150 scholarships worth $340,000 to Tech students in the 2014 fiscal year, including seven new endowments from Alumni Networks and Affinity Groups.

In late 1976, two of Chip Robert’s daughters pledged $596,000 for the renovation and dedication of an Alumni House in his name. He graduated from Tech in 1908 with a bachelor’s degree in civil and experimental engineering. Robert was the BMOC back then, serving as captain of the football, baseball and cross country teams, earning 15 varsity letters total. After “getting out,” he founded the Robert and Company engineering and architecture firm in 1917, and helped build several structures on Tech’s campus.

Our youngest alumnus is 16, but he graduated at age 14 with a bachelor’s degree in applied math in 2012. He then earned his master’s at Tech this year, and is currently still on campus, working on his PhD.

The Living History program, led by Marilyn Somers, celebrated its 20th anniversary this year and to date has collected 971 stories of GT alumni, faculty, staff and friends in its archive. In addition, a new documentary on legendary Yellow Jacket coach Bobby Dodd gets its exclusive world premiere on Sept. 6.

Our most famous alumnus is most likely former U.S. President Jimmy Carter, Cls 46, now chairman of The Carter Center here in Atlanta.

Or is it George P. Burdell, AIA, MS EE 69, chief mischief officer of the Alumni Association?

Tech alumni (both living and deceased) have hailed from 184 countries, all 50 states and 3 U.S. territories.

The Association supports more than 100 regional Alumni Networks and Affinity Groups throughout the U.S. and abroad which provide common bonds — whether geographic or by interest — for proud Yellow Jackets to network professionally, socialize, recruit students, raise funds and perform community service. These groups held 850 local events this fiscal year, with more than 22,500 alumni, parents and students in attendance.

The Association is also extremely active on Facebook, Twitter, Pinterest, Instagram, Flickr, YouTube and more, and in total recorded more than 2 million social interactions online with alumni and friends during fiscal year 2014. Follow us. Let’s be friends!

Mentor Jackets is one of our most popular ways for alumni to give back to Tech with their time and effort. More than 1,132 mentor-student pairs were made during the 2013-14 academic year. (Read more about Mentor Jackets on page 80.)

The largest student organization on campus is the Student Alumni Association. SAA finished last year with a whopping 4,291 members, all of whom gave financially to Tech.

The Georgia Tech Student Foundation awards grants to students and organizations whose ideas enhance the Institute. GTSF was established in 1986 through a $100,000 endowment made by the late J. Erskine Love Jr., ME 49. Since then, GTSF has allocated more than $600,000 back to student initiatives on campus and, even more remarkably, grown the original endowment to $1.2 million. The GTSF, which was named CASE’s national student organization of the year in 2011, stands as one of the few collegiate foundations in the country solely operated by students. Its members are often featured on Fox Business News.

The Association’s 67th Roll Call for fiscal year 2014 proved to be the most successful ever, generating more than $9 million in donations from 33,072 donors. Perennially, GT ranks No. 1 or No. 2 among public research universities in the nation for the philanthropic participation rate of its alumni. In other words, you give back like few others do!

Alumni Networks handed out 150 scholarships worth $340,000 to Tech students in the 2014 fiscal year, including the creation of seven new scholarship endowments from Alumni Networks and Affinity Groups.

Find out more about the Alumni Association on our brand spanking new website at gtalumni.org. It’s your place to keep up to date with relevant news, event information and registration, photos, videos, access to services, online giving and more. Register now while you’re thinking about it!

Or come network with your fellow Yellow Jackets on LinkedIn. Our LinkedIn group is one of the largest in the country, featuring 30,827 alumni members looking to make career connections.
Georgia Tech Alumni Stats

TOTAL NUMBER OF GT ALUMNI
141,217

UNDERGRADUATES
101,355 (72%)

GRADUATES
37,740 (27%)

NON-GRADUATES
2,392 (1%)

Current Alumni by Graduation Year

Current Alumni by College

Current Alumni by Gender

ALUMNI BY STATE (Top 10)

Georgia (58%)
Florida (9%) California (7%)
Texas (6%) North Carolina (5%) Virginia (4%)
South Carolina (3%) Tennessee (3%) Alabama (3%) Maryland (2%)
A powerful partnership is broadening between Georgia Tech and Gulfstream Aerospace Corporation. A Savannah-based initiative will feature faculty exchanges, a greater emphasis on research-based courses, internships and a track to all levels of employment. The alliance comes as Gulfstream—the world’s most technologically advanced business jet manufacturer—is rapidly expanding its research and development complex and investing in next-generation advancements in aviation.

To learn more about full-time opportunities, visit gulfstreamcareers.com.
Celebrating Roll Call: 2014 President’s Dinner

At this summer’s exclusive President’s Dinner, we celebrated the success of the Georgia Tech Alumni Association’s yearlong Roll Call campaign that directly raised more than $9 million for the Institute’s academic programs.

Hundreds of Tech alumni and friends delighted in the incredible scenery of the Georgia Aquarium, dined on a scrumptious meal (don’t worry, no fish were served), and danced the night away to the smooth groove of 1970s cover band Yacht Rock Schooner. Roll Call Leadership Circle donors who gave $1,000 or more during the year earned invites to the black-tie event, which is just a small way for the Alumni Association to say “thank you” to some of its most generous supporters. If you want to be part of this party in 2015, be sure to give back to your alma mater by donating $1,000 or more to Roll Call.
The Alumni Travel Program takes Tech grads and friends to exciting locales around the globe.

Alumni Adventures for 2015

Martin Ludwig

Experience the world with your fellow Tech alumni, family and friends on one of the fascinating journeys across the globe we’ve planned for the 2015 calendar year. The Georgia Tech Alumni Association travel program brings the world to you by offering tours to a wide range of exciting—and sometimes exotic—destinations put together by some of the world’s best educational tour operators and cruise lines.

The 2015 schedule includes a diverse selection of tours for you to choose from throughout the year. Some are all-inclusive, leaving you to simply enjoy your vacation without many decisions to make, while others allow you the opportunity to set your own adventures by choosing from a recommended list of excursions. Whatever you are looking for, we will do our best to provide a once-in-a-lifetime vacation for you and your traveling companions.

While our tours may change each year, our goal remains the same: to offer expertly planned, enriching travel experiences designed to enhance your lifelong education, while at the same time strengthening your connection with fellow Yellow Jackets and Georgia Tech.

At the Georgia Tech Alumni Association, we are excited about the coming travel year and the wonderful places it will take us. We hope that you will join us on one or more of our unique journeys. The adventures listed here are just a small sampling of the trips we have planned for next year.

THE DEEP SOUTH

Expedition to Antarctica (MS Le Boreal), Jan. 26-Feb. 8, Gohagan
A spectacular 14-day journey featuring a nine-night cruise to Antarctica, Earth’s last frontier, aboard the exclusively chartered, deluxe MS Le Boreal. Experience the White Continent in its unspoiled state, accompanied by the ship’s expert team of naturalists. Includes two nights in vibrant Buenos Aires, Argentina.

Treasures of Patagonia (MV Via Australis), Feb. 22-March 4, AHI
Discover the natural treasures of Chilean Patagonia, the dynamic city of Santiago and the lush, forested Andean Lake District. An unforgettable highlight of this adventure is a three-night cruise through Tierra del Fuego on the inviting MV Via Australis, with modern comforts and a knowledgeable captain and crew.
EXOTIC EXCURSIONS

Amazon Discovery Expedition, March 23-April 2, Haimark
Peru presents the traveler with so many natural and manmade wonders, and this incredible journey has it all: Lima, former heart of the Spanish empire in the Americas; Machu Picchu, the sacred “Lost City of the Inca”; and a four-night luxury expedition cruise on the Amazon, nature’s richest ecosystem.

Africa’s Wildlife, June 14-27, Odysseys Unlimited
Explore a world primeval on this 14-day safari through some of Southern Africa’s great wildlife sanctuaries. See awe-inspiring natural wonders on this small group tour, limited to just 24 guests, through South Africa, Zimbabwe, Botswana and Zambia. Experience a variety of wildlife-viewing activities, guided canoe trips, sunset river cruises and fishing.

Galapagos Islands, June 17-24, Orbridge
Undiscovered by Europeans until the 16th century, the Galapagos Islands hold a central position in modern scientific and evolutionary history. From the Isabela II, you can explore these fascinating islands and observe the iconic species, such as tropical penguins and playful sea lions, that have become exquisitely adapted to their surrounding environment.

CRUISING EUROPE

Mediterranean Artistic Discoveries (Riviera), May 10-22, Go Next
Acquaint yourself with the classical splendors and beautiful landmarks of the Mediterranean as you sail to ports of call in Italy, Croatia, Montenegro, Monaco, France and Spain aboard the luxurious Riviera, Oceania Cruises’ newest vessel. A marvelous architectural and artistic feast awaits.

Grand Danube Passage (MS Amadeus Silver), Sept. 8-22, AHI
Experience Eastern European culture, marvelous old-world capitals, ornate cathedrals and picturesque villages as you cruise the celebrated Grand Danube Passage for eight nights aboard the exclusively chartered MS Amadeus Silver. Discover enthralling scenery in eight countries and 13 cities and towns on the “king of Europe’s rivers.”
Insider’s Japan, Sept. 19-Oct. 1, Odysseys Unlimited
Venture to a land of delicate art and bustling commerce, of rich traditions and dizzying modernity on a small group tour, limited to just 24 guests. The 13-day journey features the highlights of Tokyo and Kyoto, engages you in local life, and takes you off the beaten path to the lovely historic cities of Takayama and Kanazawa.

Bangkok to Bali (Eastern & Oriental Express), Oct. 21- Nov. 2, AHI
Experience an exotic kaleidoscope of colors, sounds, cultures and ancient histories in Thailand, Malaysia, Singapore and Indonesia. Visit elaborate temples, palaces and shrines throughout these exciting lands, and celebrate the golden age of travel for three nights aboard the legendary Eastern & Oriental Express Train.

National Parks and Lodges of the West, May 23-June 1, Orbridge
Enjoy spectacular scenery and overnight stays in extraordinary landmark park lodges that are destinations themselves on this 10-day journey tracing the historical paths and natural splendors of the Old West. See and learn about the storied sights and monuments of four of our most magnificent national parks, traveling with an expert expedition leader in a private motor coach.

Alaska Passages (Regatta), July 14-24, Go Next
Discover Alaska’s rugged beauty while cruising on the elegant Oceania Cruises Regatta. From Seattle, sail north to the picturesque Alaskan ports of Ketchikan, Wrangell, Juneau, Skagway and Sitka, marvel at the magnificent Hubbard Glacier, and return to Seattle via the lovely city of Victoria, B.C.

If you don’t see a Georgia Tech Alumni Trip here that you’re interested in, go to gtalumni.org/travel for the full list of more than 30 adventures.
The Leadership Circle is the cornerstone of Roll Call, Georgia Tech’s annual fund. By becoming a member of the Leadership Circle, you help ensure Tech’s prominence and adaptability in an ever-changing world.

Join one of our leadership giving clubs and enjoy benefits such as a limited edition tie or scarf and an invitation to the annual President’s Dinner, Celebrating Roll Call.

A tradition of leadership has evolved at the Georgia Institute of Technology over many generations ... we hope you’ll join us.

“*We believe Georgia Tech is a great place to capture a high return. Roll Call giving at the Leadership Circle level enables your gift to grow exponentially as it benefits so many on campus.***”

– ANGELA G. MITCHELL PTCH ’04 AND JAMES L. MITCHELL CE ’05 (GEORGIA TECH ALUMNI ASSOCIATION BOARD OF TRUSTEES)

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The Perfect Pairing: Student and Mentor

Laura Giglio, EE 10, MS ECE 11

Go to gtalumni.org to find out how you can support Tech and its students.

Three Georgia Tech alumni share their stories about what it means to be a Mentor Jacket.

We’ve all been there. We know how tough Georgia Tech can be. Even more intimidating is the prospect of finding a job once you get out. But you’ve done it successfully, and you probably have a ton of great insights to share with current Yellow Jackets who are in the thick of this exciting and scary phase of life.

That’s where Mentor Jackets comes in. Mentor Jackets is a one-to-one mentoring program sponsored by the Georgia Tech Alumni Association and the Georgia Tech Student Alumni Association. The program partners current SAA members from all colleges, degree levels and backgrounds with Tech alumni from Atlanta and around the world.

Mentor Jackets is thriving, with more people signing up to participate each year. This year, we expect more than 1,200 alumni-to-student pairs as the popular campus-wide, nationally recognized program continues to grow. Here are three success stories from last year that prove the commitment from our mentors are well worth their time and effort:

Mentor-Student Pair No. 1: Maximizing Limited Time Together

Mentor: Anu Parvatiyar, BME 08
Student: Elizabeth Morris, BME 14
Communication method/frequency: Less than once per month, in-person and via email
Challenge: “Initially, the idea of being a mentor this year was a bit daunting because my schedule involved month-long trips abroad and constant domestic travel in the interim,” Parvatiyar says. “Having been a mentor before, I wanted to do justice to the partnership. From the outset, we decided what our goals were, how often we could meet and what we should expect from each other.”

Mentoring need: Says Parvatiyar: “As a graduating senior, Elizabeth mainly wanted to focus on her job search, choosing a job offer and what to expect in the real world. When she had specific questions outside of my own experience, I typically helped her connect with someone in my network. I made a commitment to respond to her emails within 48 hours with the understanding that when she emailed it was for an important reason.”

Advice for other mentors: “Sometimes a student needs more input, insight and involvement from a mentor, which can be rich and fulfilling for both mentor and mentee when they go into the partnership prepared for that,” Parvatiyar says. “However, a strong investment up front to understand each other and our goals can lead to a strong, if less frequent, mentoring relationship. I’m proud to see where Elizabeth is going to go, and looking forward to watching her—and our partnership—evolve as she starts her career with Emerson.”

Impact: “The fact that both Anu and I were very busy and we discussed this up front took a lot of pressure off both of us,” Morris says. “I was able to set goals and focus on what I really wanted to get out of my senior year. I was able to lean on her when I needed her the most, but we both were able to maintain all of our other responsibilities too!”

Want to join Mentor Jackets and make a huge difference in the lives of current Yellow Jackets? Learn more and register at www.gtmentorjackets.com.
Mentor-Student Pair No. 2:
Making a Difference from a Distance

Alumni Mentor: David Rowley, MS EE 81, from Kokomo, Ind.

Student: Angelique McCoy, ECE undergraduate

Communication method/frequency: Phone call once every two weeks with intermittent emails

Challenge: “The distance between us; we were never able to meet in person,” Rowley says.

Mentoring need: Says Rowley: “Angelique, like many of her fellow students at Tech, was facing a lot of challenges. The biggest thing I could give her was encouragement and to help her find the positive in every situation. For example, she needed to find a way to make some money and I encouraged her to ask about getting paid for research she was already planning to do during the spring semester. I told her if she didn’t ask, the answer would be no. She was able to make that work out.”

Advice for new mentors: “You can make an impact more easily than you think,” Rowley says. “I sometimes thought I wasn’t making a positive impact when Angelique’s projects didn’t go the way we hoped. But we worked through obstacles together, such as when she didn’t get a tutoring job she had worked hard for, but ended up landing a much more fun job at a summer camp helping kids build Lego projects. It has been great to hear her boundless enthusiasm for what she was doing and I think Angelique will easily get through future bumps in the road.”

Impact: "Even though we have never met in person, my mentor and I have been able to form a great connection," McCoy says. "He has gone above and beyond to stay connected to me. He even thought enough to check on me during the snowstorm last semester. He’s always optimistic and gives great advice, and he always communicates when he says he will. He helps me with any issue or subject that I bring up—classes, resumes, research, etc. David is just an all-around great person and role model.

Mentor Student Pair No 3:
Great Challenge, Great Friendship

Mentor: Sonny Chaffin, ChE 68, MS NE 69

Student: Zhong Chen, MS CSE 13

Communication method/frequency: In person and almost every week

Challenge: "My first mentee was not only an international student from China, but also a graduate student in computer science and engineering," Chaffin says. “Sure, there was the regular stuff about resumes, job interviews, career goals, etc., but he mainly wanted to know about America. We quickly got to the stage where he felt comfortable asking what English words meant. The most fun part was when he asked me to help him get his U.S. driver’s license!”

Mentoring need: “Despite our differences, I quickly got to know Zhong very well and soon realized that what he really wanted to learn were things I could easily teach him!” Chaffin says. “Sure, there was the regular stuff about resumes, job interviews, career goals, etc., but he mainly wanted to know about America. We quickly got to the stage where he felt comfortable asking what English words meant. The most fun part was when he asked me to help him get his U.S. driver’s license!”

Advice for other mentors: Says Chaffin: “I was initially disappointed when I first found out I had been paired with an international student, but it could not have been a more fun and rewarding experience for both of us. We remain great friends, and even though he has moved on to a job at Microsoft, we still Skype together every week.”

Impact: “My mentoring experience with Sonny was just unforgettable,” Zhong says. “Sonny is someone I will always talk to before I make any big decisions. Most important, he has helped me understand the professional and academic culture in the U.S. and has helped me with my own personal and professional growth.”

MENTOR JACKETS
BY THE NUMBERS

1,132
Alumni-student mentoring pairs during 2013-14 academic year

64
Different majors represented by students from all six colleges

42
States where mentors live

23
Countries outside of the U.S. where mentors live
KUDOS!

The Alumni Association’s Networks and Affinity Groups depend on volunteer leadership to organize gatherings, fundraisers and community service projects. Here are a few leaders who deserve thanks for all of their hard work.

Fred Carlson, CE 01, MBA 04, recently completed his term as the president of the Tampa/Suncoast Network, and led the charge for the network to be the best in the country. He increased the Roll Call participation levels this year to a record high, and it was through his leadership, energy and commitment to excellence that helped the Suncoast Network gain great strides in programs and volunteer participation. Fred will remain active on the network’s board and supportive board director. Thank you, Fred, for being a great role model for the GT family!

Alex Munoz, MGT 88, stepped in and did a tremendous job breathing life back into the Atlanta Intown Network. It needed a president who could guide it back to relevance while creating a vision for what it could become, and Alex provided exactly that. He was able to recruit and secure a core group of leaders who helped build the framework for the Network’s initiatives. Under his leadership, the group established marquee events, such as Night at the Symphony and the Tennis Invitational. Bravo, Alex!

Gaurav Nagle, AE 07, MS AE 09, greatly increased alumni activity for the Northern California/San Francisco Alumni Network by organizing monthly social activities such as happy hours, brunches, hikes and Tech football game viewings. He’s also led efforts that have left a lasting impact, including annual Accepted Student Meet-and-Greets, Student Sendoffs and alumni educational programs. Gaurav has inspired many Bay Area alumni to get more actively involved in supporting Tech and he’s improved the visibility of the Network in the region. We thank him for all his hard work and dedication!

The Georgia Tech Student Alumni Association (SAA) and Georgia Tech Student Foundation (GTSF) took home top national awards for their programs at the 2014 CASE ASAP National Conference in St. Louis last month. The Council for Advancement and Support of Education (CASE) is a professional association for educational institutions, and its Affiliated Student Advancement Programs arm helps support student organizations and initiatives.

The SAA won the Outstanding Internal Program award in the student alumni association category for its successful Dinner Jackets program. Dinner Jackets gives SAA members a chance to break bread with alumni, faculty and staff, and discuss life after college. Volunteers host the dinners, which can range from home-cooked meals to a night out at a restaurant.

Meanwhile, the GTSF also won the Outstanding Internal Program award, but in the student foundation category. Its Investments Committee Mentorship Program teaches the basics of investing in the stock market, researching companies and managing a portfolio. After students complete the program, they may join the committee to help manage the Foundation’s endowment fund.

(Garrett) Above, from L to R) Darshan Patel, GTSF CEO accepts the award for the Foundation’s Investment Committee Mentorship program, while Ria Banerjee, SAA VP-operations, and Harrison Obiorah, SAA committee chairman, accept the award for Dinner Jackets.

Two Tech Student Programs Rank No. 1 in the Nation

The Alumni Association’s Networks and Affinity Groups depend on volunteer leadership to organize gatherings, fundraisers and community service projects. Here are a few leaders who deserve thanks for all of their hard work.
“My team and I are working smarter and saving money after earning our project management certificates. We immediately applied information from the first class and are seeing major changes even to this day. As a business owner, I have the satisfaction of knowing we were trained by the best.”

Matt Rawlins
President, Rawlins Mechanical
2013 Project Management Certificate
Have a new job or other news to share? Email details to ramblinroll@gtalumni.org.

1950s

Darryl Aubrey, ChE 55, was elected mayor of North Palm Beach, Fla., for a second term. He served on the Village Council for eight years prior, held management positions with Exxon Chemical Company, taught as a tenured professor of management at Sacred Heart University and served as vice president of Chemical Systems.

1970s

William Randall “Randy” Moore, Mgt 76, was named dean of the Upper School at Oak Mountain Academy in Carrollton, Ga. He retired from the Coweta County School System.

Robert Osattin, Cls 75, retired from the technology department at the Cox Media Group on Feb. 28. CMG manages the media properties of Cox Enterprises, which includes the Atlanta Journal-Constitution, where Rob worked since 1974.

Stefan Stein, EE 77, has been named a Super Lawyer by Florida Super Lawyers. He is a shareholder for GrayRobinson, PA.

Rod Westmoreland, IM 74, was recognized on the 2014 Financial Times “Top 400 Financial Advisors” list for the fifth year straight. He is a private wealth advisor in the Private Banking and Investments Group at Merrill Lynch. He lives in Atlanta.

Shealy receives Lifetime Achievement Award for work in snow sports epidemiology

Jasper “Jake” Shealy, Psy 63, received the National Ski Areas Association (NSAA) 2014 Lifetime Achievement Award, recognizing him as one of the most influential and important names in ski safety over the last 40 years. The NSAA said that “through Shealy’s expertise and his passion for research, his work has helped save the skiing and riding public hundreds of millions—if not billions—of dollars from injuries prevented.”

Beginning in 1973, Shealy served as a professor of Industrial and Manufacturing Engineering at the Rochester Institute of Technology (RIT) in Rochester, N.Y. He rose up the academic ranks quickly at RIT, finally serving as chairman of the school’s Industrial Engineering department from 1992 through 2000. Since 2001, he has served as professor emeritus. During that time, Shealy set a high standard for some of the most important ski injury research conducted to date, working closely with equally respected peers Carl Etlinger, MS, and Bob Johnson, MD, in Vermont. His research data provided the ski industry with invaluable insights into the causation, mitigation and prevention of ski injuries, leading to the development of mechanical innovations for ski and snowboard gear designed to reduce injuries. He was co-editor of several volumes of the Ski Trauma and Safety journals, and remains one of the most distinguished pillars of snow sports epidemiology in the world.
Savoy Magazine recently named three Tech alumni among its “2014 Top 100 Most Influential Blacks in Corporate America.” They include: 1. Ralph Cleveland, ME 86, global head of customer operations for AIG Property and Casualty Insurance; 2. Jerome Hamilton, IE 91, MS IL 02, vice president of Lean Six Sigma, Corporate Quality & Acquisition Integration at 3M; and 3. Bob Stargel, EE 83, vice president of global nonwovens for Kimberly-Clark Corp. and chair of the Georgia Tech Alumni Association Board of Trustees. Savoy selected all three as exceptional examples of African-American achievers, influencers and executives facilitating global change through their leadership.

Out & About

1. Kumar S. Rajan, ChE 97, and 4-year-old future Yellow Jacket Kiran wore matching Tech hats while strawberry picking in Shelton, Conn. 2. W. Wayne Wilbanks, BC 70, has traveled to Lom, Bulgaria, for the past seven years to volunteer for a local orphanage. Here he poses with Zoiko, one of the many kids in need with whom he’s formed strong bonds. 3. Members of the Georgia Tech San Antonio Alumni Network, led by Amy Avery, CE 01, proudly show off their renderings of the Tech Tower at a painting party, one of the group’s favorite events. 4. Though he’s now living in GB (Great Britain), Daren Pietsch, ME 91, displays his GT ties through the decal on the back window of his Audi. He only wishes it were a little bit bigger (the decal, not the car). 5. Members of the Hampton Roads GT Alumni Network get their grape with friends from Virginia Tech at a wine tasting event that helped raise scholarship monies at both schools. 6. Tech President G.P. “Bud” Peterson got out and about this summer. He toured the state of Georgia, and here he speaks with parents, alumni and friends at the Augusta GT Alumni reception. 7. The Northern California/San Francisco GT Alumni Network gets ready to run before their Ghost Pi Mile event this past April. 8. Accepted Student Meet and Greets, like this one hosted by the San Diego GT Alumni Network, are a great way for alumni to connect with potential new Yellow Jackets.
Have a new job or other news to share? Email details to ramblinroll@gtalumni.org.

1980s

Kelly Barrett, IM 86, has been elected as a board director for the Girl Scouts of Greater Atlanta. She is vice president of internal audit and corporate compliance for Home Depot.

Jimmy Etheredge, IE 85, was recently appointed to managing director of Accenture’s Atlanta office. He will also continue as Accenture’s North America senior managing director of the products operating unit.

Andre’ Jarboe, CE 82, earned his 20th U.S. Patent on May 20. The patent, for controlling content and media, allows devices to share content, media and parental control settings without having to manually request and register with a rights authority or individually set parental controls. Andre’ is the director of information technology at AT&T.

Ken Klaer, IE 81, joined Comcast Cable as senior vice president, premises technology. He was formerly a part of the service provider video technology group at Cisco Systems.

Scott B. Pantaleo, ME 82, was named a TAPPI Fellow for 2014. TAPPI is the leading association for the worldwide pulp, paper, packaging and tissue and converting industries.

1990s

Hugh R. Gaston, ChE 98, is promoted to vice president of operations of Acumen Physician Services, which develops and delivers intuitive software tools to assist nephrologists in the practice of medicine. He joined Acumen in 2009 as a former director of client services.

Tywanda H. Lord, IE 96, was selected to participate in the 2015 class of Leadership Atlanta. She serves as the deputy chair of Kilpatrick Townsend’s Diversity Council and as a member of the State Bar of Georgia Diversity Steering Committee.

Victoria Selfridge, IE 97, was named vice president of Corporate Communications at Ent Federal Credit Union. She formerly served as Ent’s director of marketing.

2000s

Bronwen Halstead Nussloch Garner, IA 03, joined the internal medicine residency program at Duke University after her graduation from the Medical College of Georgia. She lives in Durham, N.C., with her husband, David.

Chris Meyer, EE 05, MBA 11, has been named engineering director of the west region at ExteNet Systems. He and wife, Suzanne, Arch 05, M Arch 09, will be relocating to San Francisco.

Christopher R. Moriarty, Bio 07, was awarded the Doctor of Osteopathic Medicine Degree from Georgia campus—Philadelphia College of Osteopathic Medicine. He will continue his medical training in a traditional internship at Peconic Bay Medical Center in Riverhead, N.Y.

2010s

Morris L. Gavant, HS 76, was inducted as a Fellow, the highest honor bestowed to a radiologist, into the American College of Radiology (ACR) in April. He is a partner physician at Advanced Radiology in Baltimore and an active staff physician at Baltimore Washington Medical Center, where he was formerly chief of the radiology department. Over his career, he has specialized in emergency radiology, body imaging, neuroradiology and MRI. Gavant received his medical degree from Emory University School of Medicine in Atlanta, and completed his residency and fellowship at the University of Tennessee. ACR Fellows demonstrate a history of service to the College, organized radiology, teaching or research. Approximately 10 percent of ACR members achieve this distinction.

David W. Hogan, Mgt 10, was recently promoted to the rank of Captain in the U.S. Marine Corps. He is currently deployed with the 22nd Marine Expeditionary Unit.

Jeremy Kobus MS IA 11, MBA 12, was appointed as the director of the Millennium Gate Museum of History (The Gate) in Atlanta.
A portion of the proceeds collected from the transportation costs will be paid to the Georgia Tech Alumni Association.

Another benefit from the Georgia Tech Alumni Association

Preferential **YELLOW JACKET** treatment

* Minimum of a 55% discount on all interstate relocations.
* Free Full-Value Coverage up to $50,000.
* 15% discount on all Georgia and Florida intrastate moves.
* Guaranteed on time pick-up and delivery.
* Personalized attention from start to finish.
* Top rated drivers will be assigned to all Yellow Jacket shipments.
* Sanitized air-ride vans.

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Contact Tom Larkins (The Ramblin’ Relocator) for details on this program 1-800-899-2527 or e-mail him at tom.larkins@atlanticrelocation.com

* A portion of the proceeds collected from the transportation costs will be paid to the Georgia Tech Alumni Association.
1. Elizabeth Dixon, Mgt 05, and her husband, Brett, welcomed Robert “Bo” Ford on June 17. The family, including big brother James, lives in Marietta, Ga.

2. Gail Littlewood Garcia, Mgt 00, and her husband, Adrian, welcomed son Daniel Adrian on Dec. 23, 2013. They reside in Houston.


4. Erika (Geist) Hamrick, ME 96, and her husband, Spencer, welcomed daughter Leighton Marie and son Colson Cline on April 7. Erika is a regional sales manager for Caterpillar Marine. They live in Weston, Fla.

5. Kristin Hitt, IA 09, and her husband, Nathanial Hitt, Mgt 09, welcomed son Kevin Alistair on June 2. The family lives in Sterling, Va.


8. John “Bo” R. Rankin, IE 02, and his wife, Becky, of Winter Garden, Fla., welcomed daughter Addison Pearl on Nov. 5, 2013. Looking on in the photo is her big brother Shea.
Ever wanted to meet an astronaut?

Now you can.

As a Georgia Tech alumni you’ve got astronauts, CEOs, and distinguished engineers in your alumni family. Our brand new alumni portal will allow you to easily connect with grads from any year. Even the ones who’ve been to space.

Register today at

login.gtalumni.org
1. Christopher Collins, ME 07, and Rhonda Sadler, Psy 06, STC 06, on March 29 in Atlanta at the Carter Center. Christopher is an engineer for Jordan and Skala Engineers and Rhonda is an attorney. They live in Atlanta.

2. Joe DiDia, Mgt 11, and Vida Jemec, PFE 11, on April 26. Joe is a senior housing trader at HavenBrook Brokers and Vida is a catalog account sales manager at WIKA Instruments. They live in Atlanta.

3. Bobby Fiorentini, Mgt 10, and Christi Nesmith, ME 10, on April 27 at Park Tavern in Piedmont Park. Bobby is a consultant at Manhattan Associates and Christi is an engineer at Lockheed Martin and a MBA candidate at Georgia Tech. They live in Smyrna, Ga.

4. Evan Harrison, AE 13, and Caitlin Collins, BCh 12, on May 24 in Clemson, S.C. Evan is working on his master's and PhD degrees in Aerospace at Tech and Caitlin is an ophthalmic technician at Georgia Retina. They live in Smyrna, Ga.

5. Ryan Hodge, ME 11, and Rachel Douglas, IE 10, on Nov. 9, 2013, in Atlanta at the Historic Academy of Medicine at GT. Ryan is a supply coordinator at Phillips 66 and Rachel is a quality engineer at MD Anderson Cancer Center. They live in Houston.

6. Mitchell Scates, Mgt 10, and Mallory Necessary, CE 10, on March 29 in Atlanta. Mitchell is a service manager at Rush Truck Center and Mallory is a transportation engineer at Kimley-Horn and Associates Inc. They live in Atlanta.

Jahi Word-Daniels, Mgt 12, and Shaday Woolcock, Mgt 11, on July 12 in Marietta, Ga.

Have a new job or other news to share? Email details to ramblinroll@gtalumni.org.
Meehan named 2016 president of the Society of Petroleum Engineers

D. Nathan Meehan, Phys ’75, senior executive adviser at Baker Hughes, was selected as the 2016 president of the Society of Petroleum Engineers. Meehan, who works in Houston, will take office as president-elect this fall. Prior to Baker Hughes, Meehan was president of CMG Petroleum Consulting, vice president of engineering for Occidental Oil & Gas, and general manager of exploration and production at Union Pacific Resources.

New York
Gilbert & Sullivan Players
H.M.S. Pinafore
Ferst Center
September 12 at 8 pm

Bourne Poetry Reading
featuring Richard Blanco & Jericho Brown
Kress Auditorium
September 25 at 7:30

VarietyTech/Let’s Try This!
Dean Dull Theatre
September 25–October 3

Sybarite 5
Free string quintet concert
Ferst Center
October 9 at 7 pm

Poetry: Ron Smith & Seth Michelson
Kress Auditorium
October 16, 2014

Yellow Jacket Marching Band
Ferst Center
October 31 at 7:30 pm

GT Orchestra
Ferst Center
November 4 at 7:30 pm

GT Symphonic & Concert Band
Ferst Center
November 6 at 7:30 pm

DramaTech
Student Directed One-Act Plays
Dean Dull Theatre
November 7-22

GT Jazz Ensemble
Ferst Center
November 11 at 7:30 pm

Poetry: Denise Duhamel & Malachi Black
Kress Auditorium
November 13, 2014

GT Glee Club
Ferst Center
December 1 at 8 pm

School of Music Holiday Concert
Ferst Center
December 2 at 7:30 pm

details and more events at arts.gatech.edu
404-894-2787


Wester Joseph Constantin, IM 49, of Baton Rouge, La., on June 14. WWII.


John Lewis Hancock, ChE 48, MS ChE 49, of Germantown, Tenn., on May 16. Army. WWII.

James Albert Hand, Cls 47, of Salem, Ore., on June 11. V-12 Navy College Training Program, Georgia Tech. WWII. Pastor. Professor of religion and department chair, Willamette University.


Bert Kavy, Cls 47, of Ossining, N.Y., on June 14. President, Congregation Sons of Israel. President, Scarborough School.

John G. “Jack” Kearney, ME 43, of Buchanan, Va., on June 6. Army (2nd Lt.). Founder, Kearney Industries; Sematco Incorporated.


Paul Grant Beswick
ARCHITECTURAL PHOTOGRAPHER

Paul Grant Beswick, Arch 70, of Marietta on April 24. Trained in architecture at Georgia Tech, Beswick worked as an architect for several years before finding his calling as an architectural photographer. He photographed national landmarks, such as Monticello and Mount Vernon, and many state capitols. Beswick was a member of the American Institute of Architects. In 1994, he received an award for his photographs in the AIA Guide to Architecture of Atlanta. He was also known for his work photographing interiors and southern gardens for several popular publications. According to loved ones, he lived a full life: traveling, skiing, playing golf and capturing amazing places with his photography. He died after a valiant fight with multiple sclerosis.
Joseph Samuel Perrin, Cls 45, of Tucker, Ga., on April 4. Founder and Chairman of the School of Art and Design, Georgia State University. WWII. Army Air Corps. Professor of Art, University of New Hampshire. Clarkson Community Center, President, Atlanta Arts Festival. Atlanta Civic Design Commission. Chairman, MARTA Arts Council. Underground Atlanta. Designer, West Lake Marta Station. Curator. Art featured in the High Museum of Art, the Coca Cola collection, Mead Collection, the Georgia Museum of Art, the Carter Presidential Center and the Metropolitan Museum Recife, Brazil.

Donald Ravitch, Cls 48, of San Francisco, Calif., on May 27. President and chairman, Sherman Clay and Company.


Winslow M. “Mac” Schneider, Cls 42, of Birmingham, Ala., on June 26. District engineer, BellSouth/AT&T. Granddaughter: Joni Lakin, Psy 03.

David Ernest Shefka, Cls 44, of Kinston, N.C., on June 3. WWII. General Electric.


James M. Cantrell Jr., ME 57, of Murfreesboro, Tenn., on April 30. Air Force. Meteorologist, National Guard.

Thomas “Pete” Fletcher, ME 51, of Atlanta, Ga., on May 14. Southeastern regional supervisor, U.S. Department of Housing and Urban Development.


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**1950s**


Charles Alfred Allen, IE 54, of Grayson, Ga., on June 18. Army, Owner, Allen’s Turf & Tractor.


James Logan Bellamy, EE 46, of Scotts Valley, Calif., on June 1. Bellamy was an aerospace engineer who considered his greatest professional accomplishment the five Mizar satellites currently orbiting the earth. Bellamy joined the U.S. Navy in 1944 and was stationed in Hawaii at the end of WWII. Bellamy earned an electrical engineering degree in 1946 from Tech, where he was a member of Kappa Alpha Order fraternity, the same fraternity as his son and grandson. Bellamy earned a master’s degree in electrical engineering from Cornell University in 1950 and did graduate work at Stanford University during the 1960s. He began his career as an aerospace engineer working for North American and Daino-Victor, followed by 35 years at Lockheed Martin designing antennas for satellites. Among his many interests, he was a published author of scientific material; a playwright; an actor in community theatre; a farmer; a breeder of goats, dogs and cats; and a wine maker.

Thomas Dewey Weaver Jr., CE 47, of Raleigh, N.C., on June 1. Navy. WWII. President, D.J. Rose & Son. Member, Board of Directors of Peoples Bank. Board of Trustees, N.C. Wesleyan College. Founder, Rocky Mount Academy.

John Dewey Weaver Jr., CE 47, of Raleigh, N.C., on June 1. Navy. WWII. President, D.J. Rose & Son. Member, Board of Directors of Peoples Bank. Board of Trustees, N.C. Wesleyan College. Founder, Rocky Mount Academy.

David Ernest Shefka, Cls 44, of Kinston, N.C., on June 3. WWII. General Electric.

James M. Cantrell Jr., ME 57, of Murfreesboro, Tenn., on April 30. Air Force. Meteorologist, National Guard.

Ervin Michael Combs, IE 57, of Huntsville, Ala., on March 24.

Robert M. Dinnat, Arch 53, MS CE 58, PhD CE 70, of Charlotte, N.C., on April 7. Navy. WWII. Associate Technical Director, Army Corps of Engineers Construction Engineering Research Lab.


Bobby Eugene Joyner, CE 58, of Fairburn, Ga., on June 1. Aviation Constructors.


Charles Reynolds Kernan Jr., MS ME 53, of Wilmington, N.C., on June 10. Army Air Corps. WWII. Pilot, Civil Air Patrol.


Marvin Perlman, Text 53, of Dunwoody, Ga., on March 21.

Amos Eugene Qualls, Cls 57, of Fayetteville, Tenn., on March 24. FERC.


David Arthur Schulz, CerE 55, of Panama City, Fla., on May 30. Research engineer. Union Carbide. Amoco. BP.

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**Tom Coleman**

**POLITICIAN AND BUSINESSMAN**

Tom Coleman, IM 50, of Savannah, Ga., on June 4. Coleman is remembered as a devoted public servant to the Savannah community. Coleman was a leader at Georgia Tech, where he served as captain of the football team. After graduating from Tech, he became a physics teacher and football coach. He later joined the U.S. Army and served as an infantry captain during the Korean Conflict and in the U.S. Army Reserves. Coleman started a successful construction company, Bonitz of Georgia, where he was chairman of the board for 60 years. Coleman served on the Savannah City Council, as chairman of the Chatham County Board of Commissioners, and as a state senator representing Georgia's 1st district. Coleman was a state senator for 14 years before retiring in 1995. Former Gov. Zell Miller appointed Coleman to an at-large seat on the University System of Georgia Board of Regents. At the request of former Gov. Roy Barnes, Coleman left the Board of Regents to serve as state commissioner of the Georgia Department of Transportation. Coleman is a past member of the Board of Trustees of the Georgia Tech Athletic Association, the Georgia Tech Athletic Hall of Fame, and Savannah Area Hall of Fame, as well as past president of the Rotary Club of Savannah, past chairman of the board of Savannah Area Chamber of Commerce and past vice chair of the Union Mission. He is survived by many loved ones, including son James Patrick Coleman Sr., IM 77.


Harvey “Hobby” Banks Wright Sr., Cls 58, of Jackson, Miss., on June 2. Ophthalmologist, Laurel Eye Center. Medical staff president, South Central Regional Medical Center.


John Jacob Owen III, AE 69, MS AE 73, MS OR 77, MS IE 92, PhD IE 93, of Smyrna, Ga., on May 7. Consultant. Photographer. Artist.

George “Paul” Reid, EE 60, of Holmdel, N.J., on May 5. Engineer, Bell Labs (Lucent). Member, Telephone Pioneers of America.

Jack E. Robertson, AE 60, of Huntsville, Ala., on May 24. Wyle Labs.


Harold Frank Ford Jr.  
WWII HERO, ENGINEER AND BUSINESSMAN

Harold Frank Ford Jr., ME 49, of Auburn, Ala., on April 29. Ford was a decorated soldier and WWII veteran. At age 20, Ford arrived in Gambach, France, with the U.S. Army to attack German troops weakened after the Battle of the Bulge. In 1945, Ford and 25 other men were captured as prisoners of war. His family was notified that he was missing in action and a possible casualty of war. He was held in a German camp for three months, during which time he lost 60 pounds, weighing just 110 pounds at 6’3”. Ford was honored for his service with the Purple Heart Medal, American Theater Service Ribbon, Combat Infantry Badge, European African Middle Eastern Service Ribbon, World War II Victory Ribbon and Good Conduct Medal and Crossed Rifles Badge. In 2011, U.S. Congressman Dennis A. Ross presented him with a WWII Ex-POW Medal in Brandon, Fla. After the war, Ford earned a degree in mechanical engineering from Georgia Tech and worked for 30 years for steel supplier L.B. Foster Co., where he retired as executive vice president of the east region. He enjoyed golf, genealogy and historical road trips. In 2001, Ford wrote a book about his war experience, titled When Our Hearts Were Young and Free.
1970s

Steven Hodges Becker, Cls 79, of Sylva, N.C., on April 13. Army (Sgt. 1st Class). Spirit Moving Service. Distance Learning Studio and Information Technology Services department, Western Carolina University.


1980s


Jerry E. Kirkpatrick, ME 80, of Acworth, Ga., on May 6. Owner, Kirkpatrick Engineers.


J. Owen Forrester

FEDERAL JUDGE AND ONE-TIME “AMERICAN BANDSTAND” HOST

J. Owen Forrester, IM 61, of Atlanta, on July 1. Forrester was a U.S. District Senior Judge who was appointed to the federal bench in Atlanta by President Ronald Reagan in 1982. Following 23 years as a trial court judge in the Northern District of Georgia, Forrester took senior status in 2004, according to his obituary in the Daily Report. While a student at Tech, Forrester was better known for his passion for music than his expertise in the law. According to a profile in the Alumni Magazine, Forrester hosted a weekly TV show called Dance Party and a jazz and classics radio show. He even once filled in for Dick Clark on American Bandstand in Philadelphia. After graduating from Tech in 1961, Forrester studied at Emory University’s School of Law and joined the U.S. attorney’s staff in 1967. In 1972, Forrester became the head of Atlanta’s Office for Drug Abuse and Law Enforcement.
Raymond A. Jones Jr.
BUSINESSMAN AND EDUCATION CHAMPION

Raymond A. Jones Jr., CE ’49, of Atlanta on June 26. Jones spent his career at J.A. Jones Construction Company, the company his grandfather established in Charlotte, N.C., in 1890. He was a director of the company’s numerous national subsidiaries and retired as executive vice president of the Charlotte headquarters. In Atlanta, he was president of the Peachtree Hills Apartments Corp., chairman of Mark III Inc. and chairman of Technology Park.

Jones served in the Army before graduating from Georgia Tech, where he was a member of Sigma Chi fraternity and studied civil engineering. He also completed the Executive Program at the University of North Carolina. Later in life, he endowed the Chair of Civil Engineering at Tech.

According to his obituary, he had a lifelong interest in education, serving on the Board of Trustees of the Georgia Tech Foundation, as vice chairman of the board of Pfeiffer College in North Carolina, and as a trustee of the Charlotte Country Day School.

Carolyn Shapiro, ME ’80, MS ME ’83, of Portland, Ore. On June 3. Professional engineer. Esco Corp. Engineers Without Borders.

Edward Courtenay Sloan, CE ’85, of Atlanta, on June 12.

1990s


Christopher LaBelle, MS MoT ’98, of Alpharetta, Ga., on June 12. Project manager, Scientific Atlanta.


2010s

Daniel Thomas Mitchell, Mgt ’11, of Decatur, Ga., on May 24. IT analyst, Atlanta Gastroenterology Associates.

Friends


Mike D. Hurst, of Lawrenceville, Ga., on May 31. Teacher, GCPH.


Mykola “Mike” Marchenko, of Sugar Hill, Ga., on June 13. IBM. Mathematics professor, Georgia Tech.


John “The Colonel” Lance, of Pensacola, Fla., on April 25. AT Member. Football and Basketball player (Captain), Georgia Tech. Army (Distinguished Service Cross, Legion of Merit with one Oak Leaf cluster, Bronze star with two Oak Leaf clusters, Air Medal with six Oak Leaf clusters, Air Medal with six Oak Leaf clusters, Purple Heart, Vietnamese Medals).


Leola Collins Thomas, of Atlanta, on March 23. The president’s office at Georgia Tech.

Mary Roley “Lynn” Toups, of Largo, Fla., on June 7.

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Matt Moulthrop, MBA 04, crafted this turned bowl from the wood of an American elm tree that stood for more than 100 years and had covered the Basil Garden at the Tech Alumni House. The Association salvaged the wood after the massive elm was severely damaged by a storm in 2007. Today, this beautiful work of art resides permanently at the Alumni House.

Many consider Matt’s grandfather, Edward Moulthrop, the father of modern wood turning. A professor of architecture and physics at Georgia Tech in the 1940s, Ed taught himself how to craft exquisite wood-turned bowls and eventually dedicated his career to the art. His work is featured in collections and museums worldwide, including the Metropolitan Museum of Art and Smithsonian.

Both Ed’s son, Philip, and grandson, Matt, have continued his considerable design legacy. Matt was the only of Ed’s five grandchildren to attend Tech. Like both his grandfather and father, he tried his hand at a “practical career” and wound up back in the workshop turning wood bowls.

Over the years, three generations of Moulthrop men have created and gifted large wood-turned bowls to the Institute, including one from each on display in the Scheller College of Business.

**Time Machine**

- **5 years ago, in 2009,** Georgia Tech wins a $12 million National Science Foundation Award to develop a supercomputer.

- **10 years ago, in 2004,** Michael Arad, Arch 99, wins the design competition to create the World Trade Center Memorial in New York City.

- **25 years ago, in 1989,** the Board of Regents approves the addition of the College of Sciences, College of Computing and Ivan Allen College of Management, Policy and International Affairs.

- **50 years ago, in 1964,** Georgia Tech withdraws from the Southeastern Conference.

- **75 years ago, in 1939,** the Harrison and Howell residence halls, now used for the Freshman Experience Program, are built on East Campus.

- **100 years ago, in 1914,** Walker “Big Six” Carpenter joins Tech’s football team; in his senior year he helps lead the Jackets to their first national championship.

- **125 years ago, in 1889,** LW “Chip” Robert Jr., the namesake of the Alumni House and the first recipient of GT’s Alumni Distinguished Service Award, is born.

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Have a Tech artifact to share? Send mail to Editor, Georgia Tech Alumni Magazine, 190 North Ave. NW, Atlanta, GA 30313, or contact us by email at publications@gtalumni.org.
I am the third of four daughters raised by Charlie and Mattie Love. I was born in a public housing project in Meridian, Miss., and am the product of Meridian’s segregated public school system—where I excelled academically.

Whatever I am today, I owe to my mother and father who are both unlettered math prodigies. In fact, my first undergraduate degree came in mathematics from Millsaps College, and I had originally imagined a career in medicine. But, instead, architecture and design became my life’s work. There was just something incredibly alluring about the process of creating on a grand scale.

I headed straight to Georgia Tech to study, and as a 21-year-old freshman, I was given the opportunity to intern with an architectural firm. I worked 30 hours per week while attending classes as a full-time student. I will forever be indebted to a wonderful southern gentleman who had little common in with me, did not look like me, but was willing to take a chance on me. That firm had never had a female professional until I arrived.

Early on, I learned that architecture is a challenging and grueling field of self-expression that demands accuracy, creativity and perseverance. The social, economic, gender and racial barriers were obstacles that I had to overcome to succeed. In a recently desegregated environment—and as a woman—I needed to perform at a level of excellence in order just to be taken seriously by teachers, students, critics and employers.

I did not realize that I was a member of an underserved community until I was an adult, so I equated underserved to be the antithesis of undeserving.

And throughout my career, I have chosen to work for others, where I am most needed and appreciated. I was fortunate to be tapped by the late Maynard H. Jackson, Congressman John Lewis, Ambassador Andrew Young, my neighbor Dr. Michael Lomax and many others to apply my experience and penchant for thoroughness and hard work to serve Atlanta—in projects such as the revitalization of Sweet Auburn—and wherever I could be most effective. It goes without saying that Dr. King’s beloved community will always require the sweat equity from those to whom much has been given.

At the architecture firm I share with my husband, William J. Stanley, I have learned that materiality and style do not a fine castle make. We believe that design solutions that address a community’s social and functional needs are more long lasting and appreciated. We visit our structures often to determine whether or not they have achieved the lofty goals we set forth for them; this is a true testament of good design and social impact.

We believe our firm and our work stand as beacons to young and up-and-coming architects and designers that prove high-quality educational, research, transit and ecclesiastical facilities are birthrights. We appreciate design awards but understand that the delight and impact of those who use our facilities mean much more.

Ivenue Love-Stanley recently accepted the prestigious 2014 Whitney M. Young Jr. Award from the American Institute of Architects for her career-long dedication to bringing design to underserved communities and making design education inclusive and available to all. She was the first African-American woman to graduate from Tech with an architecture degree.
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