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The Ingenious Engineer of 2020
The engineer of 2020 “will aspire to have the ingenuity of Lillian Gilbreth, the problem-solving capabilities of Gordon Moore, the scientific insight of Albert Einstein, the creativity of Pablo Picasso, the determination of the Wright brothers, the leadership abilities of Bill Gates, the conscience of Eleanor Roosevelt, the vision of Martin Luther King and the curiosity and wonder of our grandchildren.”
Illustration by David Moyers

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Fiscal year 2003-04 can be summed up in three words: commitment, innovation and results. The highlights are showcased in the Alumni Association’s annual report.
Lindbergh’s First Plane

I read your article about Charles Lindbergh’s visit to Grant Field in “A Walk Through Tech History” (Summer Alumni Magazine) and I must share my own Lindbergh story.

My father, William Oscar Parsons, helped build Charles Lindbergh’s first airplane. Daddy joined the Army in World War I and was stationed at Souther Field, an Army flight school in Americus, Ga. He married my mother, Mable Peters, an Americus girl, in 1919 and settled there.

After the war, a small airplane factory started at the airfield and they made the “flying Jenny” airplanes. Sometime during the early 1920s, Charles Lindbergh came to Americus with a “barnstorming” group — pilots who did barrel rolls and loop-the-loops. This was exciting to watch and I remember seeing some daredevil feats when I was 3 or 4 years old.

Mr. Lindbergh wanted to buy an airplane. The owner of the factory, Mr. Wyche, agreed to build the plane. A cot was set up in one of the hangars and Mr. Lindbergh moved in to await the finished plane. My daddy said his part was to prepare and install the motor in the plane. My grandmother, Anny Lou Peters, sewed the linen panels that covered the airplane skeleton. The linen was then coated with a finish that contained banana oil. My grandmother also fixed lunches for Mr. Lindbergh.

Daddy said Mr. Lindbergh was “a quiet, shy man who did not mix with the other fellows who were working on his plane. Often he took his lunch to the top of the water tower and ate it there all alone. He seemed to be a world apart from us.”

Finally the plane was finished and rolled out of the hangar and onto the field. Mr. Wyche said, “Mr. Lindbergh, here is your plane.” Someone wound the propeller, but Mr. Lindbergh made no effort to get into the plane and fly off into the wild blue yonder.

It was the end of the day and all the workers were ready to go home, including my father. When everyone had gone home except an elderly black man named Zack, Mr. Lindbergh asked him to turn the prop and then he did take off. I heard that this was his first solo flight. This is the story my father told me later in life.

As for me, I am married to a Ramblin’ Wreck, John E. LaRowe, Arch 52. I was a nurse at Georgia Tech from 1949 to 51 and the head nurse from 1959 to 65.

Glendal P. LaRowe
Gainesville, Ga.

FeedBack

The Game has Changed

In a report to the Board of Regents, Chancellor Thomas C. Meredith outlined fundamental assumptions about the role of state funding in the planning and operation of the University System of Georgia.

The assumptions were that the level of state support would continue to follow full formula guidelines — providing X amount per student; “low” tuition would encourage Georgians to earn college degrees; access — to local campuses, to specific disciplines, for underprepared students and the financially needy — for all Georgians was important; and teaching quality must be supported significantly — for example, the back office operations must be up to par.

These assumptions no longer apply. Georgia has suffered from declining tax revenues that have forced the state to reduce support of important programs, including higher education. In the past three years, the University System has absorbed $382 million in reductions in state funding. Georgia Tech’s portion has been significant.

In fiscal year 2006, which begins in July 2005, the state will not support full formula funding. So the game has changed. The Board of Regents, and subsequently all of the universities, have to respond to an environment where less state financial assistance is the reality. This has implications for tuition, access and support.

If we want to maintain the quality of higher education in Georgia, things will change. Tuition will rise significantly. Admission policies will change to control the growth of the student population. Privatization may occur with traditional university functions. And more changes will come.

Georgia Tech is an exceptional place. But if you don’t invest and reinvest, then we can expect decline. As alumni, the Institute needs our support today more than ever.

Glendal P. LaRowe
Gainesville, Ga.

Glendal P. LaRowe
Gainesville, Ga.

ViewPoint
Entrance Exam

I always enjoy receiving my *Georgia Tech Alumni Magazine*. Thanks for always providing such interesting and thoughtful stories. I especially enjoyed the Summer edition and the article "A Walk Through Tech History." I tried my hand at the 1888 entrance exam and now I desperately want to check my answers. Can you help?

Mandy McDaniel, ID 99
Fort Valley, Ga.

We received several requests for the answers, but while the 1888 entrance exam has survived the years, the answer sheet did not, says Robert C. McMath Jr., vice provost for undergrad-uate studies and academic affairs, and co-editor with James E. Brittain of "A Documentary History of Georgia Tech's Beginnings."

Wartime Campus

I enjoyed "A Walk Through Tech History" in the Summer issue of the *Alumni Magazine*. Tech played an interesting role during World War II in the training of Navy and Marine Corps officers. I was one of the trainees at Tech in the Navy's V-12 Officer Training Program, graduating in 1946 and receiving my commission as an ensign.

Besides a full academic schedule set by the school, the Navy included other activities with particular emphasis on physical training. Yes, we had those "drownproofing" exercises developed by Freddy Lanoue that were particularly appropriate for the Navy trainees. Among the exercises he taught us was how to fall backward from the high dive with our eyes closed and how to survive in the water with our hands and feet tied. No one will ever forget those dreaded sessions in the pool.

Tech continued to have its regular sports program and the trainees were a big part of it. Under coach Bobby Dodd, Tech won the Southeastern Championship in 1943 and 1944 and won bids to the Sugar Bowl in 1944 and Orange Bowl in 1945. We had a social life too: Sammy Kaye and Les Brown brought their "big bands" for a couple of dances. The fraternities were all active. There was a full campus life at Tech even in wartime.

When the program began in 1943, Tech had 1,900 servicemen, Navy and Marine Corps V-12, NROTC and the Army ASTP. The Army withdrew its program in March 1944 because of its need for additional troops to prepare for the invasion of Normandy in June. The Marines ended its program in March 1945. The Navy continued its program of about 400 trainees until June 1946.

By fall 1945, veterans began returning to study under the GI Bill but the student population was overwhelmingly still in Navy uniform. The graduating class in June 1946 was only 365, with 74 civilians, about 20 percent. The total enrollment of all classes at that time was about 1,400.

The Navy V-12 Program was a great success for both the student trainees as well as the colleges that participated.

LeRoy E. Day, AE 46
Rockville, Md.

Those Good Ol' Days

I'm not one to write letters to the magazine. But I do have a keen appreciation for good writers, for interesting subject matters and for tasteful presentations. So I feel compelled to express appreciation for the Summer 2004 edition of the *Alumni Magazine*.

I have lived through a good part of Tech's history since my enrollment there in 1942 and graduation in 1945. I was in the Navy V-12 Program during those years and was trying hard to master the required academic work as well as the Navy training.

My goal was to graduate with a bachelor's in chemical engineering by the date set by the Navy for my transfer to midshipman school. To achieve that goal, I had to complete three years of college in two calendar years. So there was little time to think about the earlier history.

Nevertheless, I experienced some of the colorful parts of Tech's history: the dependable shriek of the power plant's mighty whistle; the comical-but-pathetic meandering of our beloved Sideways around the campus; the mystical existence on campus of the legendary George P. Burdell; a fine part of the reign of the revered Dean George Griffin; some of the glory days of Bobby Dodd and his winning teams; and the frequent retreats of "Ramblin' Wrecks" to the Varsity for a break from study and a late-night snack.

There was a rush of nostalgia for those good ol' days as I read your latest edition. Everything about the magazine was extremely well done.

C. Edwin Hodges, ChE 45
Falmouth, Maine

As Good As It Gets

The Summer *Georgia Tech Alumni Magazine* is as good as it gets! I love the Georgia Tech history and I wrote an article for you about the Ramblin' Wreck in the Winter 1992 *Alumni Magazine*.

My father, Preston Stevens Sr., and uncles were also Tech men. Coach W.A. “Alex” Alexander fetched Dad from the train in 1916 and pledged him in Kappa Sigma. He and Alex were at the Cumberland slaughter — 222-0 — as was probably George Griffin. They were close friends in the same class.

Dad said he was on the "scrub team." Alex was either a star or coach by then.

Preston Stevens Jr., Arch 52
Atlanta

Best Edition

Congratulations on publishing the best edition of the *Georgia Tech Alumni Magazine* (Summer 2004). I actually read the whole thing. Great job.

John G. Gaines, ChE 40
Prairie Village, Kan.

Accurate Quote

The quote by Georgia Secretary of State Cathy Cox ("Vulnerable Votes," Summer 2004 *Alumni Magazine*) — “Throughout Georgia history, a majority of election fraud cases have involved paper” — is 100 percent accurate. As examples, I looked at the elections of 1804, 1836, 1880 and 1904. All election fraud occurred with paper ballots.

Beth Logan, EE 86
Allentown, Pa.
Georgia Tech ranks as one of the top 10 public universities in the nation for the sixth consecutive year and the eighth time in the past decade, according to U.S. News & World Report rankings. In the 2005 release of "America’s Best Colleges," Georgia Tech is placed at 41st among all universities, public and private.

The School of Industrial and Systems Engineering retains the No. 1 position for the 14th consecutive year. In addition, every program in the College of Engineering was ranked in the top 15, with three others also ranked among the top five in the country.

“I am continually impressed by our ability to perform at such a high level across every single program in engineering. That is tough to do year after year,” says President Wayne Clough. “This has been a difficult year for higher education in Georgia, and I'm pleased that we were able to maintain high rankings.”

The College of Management moved up two slots to 34th among business schools and placed three of its programs in the nation’s top 15. For the second straight year, Tech’s co-op program was ranked as one of 11 “Academic Programs to Look For” under internships and co-ops.

Tech’s peer assessment — the school’s perceived quality among other universities — placed it in the top 25 of all universities with a score of 4.0. But variables like faculty resources, class size and faculty-to-student ratios pushed Tech into lower rankings. “We’ve done an excellent job maintaining our overall position in a difficult environment,” Clough says. “We’re one of the top research universities in the nation with a consistently outstanding engineering program and a business school that is on the move. For the first time ever, we have three business programs ranked in the top 15. That shows considerable progress in a very competitive arena.”

Another top ranking for Tech is the generosity of alumni donations. The percentage of Tech alums contributing to the Institute is the highest among any public university in the top 50.

“...I think that says a lot about this institution and our graduates,” Clough, the first Tech alumnus to become president, says. “They feel good about what they learned here. They’ve been successful in their professional lives. And they believe in the vision we have for the future of Georgia Tech. We’ve done some amazing things with their financial, professional and emotional support, and we wouldn’t be where we are without our impressive alumni base.”

Tech Alumnus Tyler Brown Killed in Iraq

A former Student Government Association president and the son of the current Georgia Tech Alumni Association board of trustees chairman was killed in action in Iraq on Sept. 14. Tyler Brown, Mgt 01, HTS 01, died when his unit was ambushed by insurgents in the Iraqi town of Al Ramadi, according to an Army spokesman.

The Army 1st lieutenant was the son of Sally and Carey Brown, IE 69, and brother of Brent Brown, Mgt 96. Twenty-six-year-old Tyler Brown was buried with full military honors at Arlington National Cemetery on Sept. 28.

“Tyler Brown was a great leader and a great patriot. His sacrifice exemplifies the extraordinary tradition of Tech alumni serving our country over the years. It’s a sad day for his family, Georgia Tech and the country,” says Joseph P. Irwin, IM 80, president of the Georgia Tech Alumni Association.

Brent Brown told the Atlanta Journal-Constitution, "He died for the country he loved, doing what he wanted to do. He lived well and died a hero. He lived life to the fullest, he truly did. He became a role model to me."

The Brown family has established a scholarship fund in Tyler's name. Donations may be made to the Georgia Tech Foundation.

Tyler Brown served as SGA president during the 1999-2000 academic year. His father also had served as student body president while at Tech. A member of Kappa Alpha and ROTC at Tech, Tyler was deployed to Iraq from South Korea with the 2nd Infantry Division in August.

“As student body president he was committed to inclusion. Tyler went to great lengths to include students who had never even thought of being involved in student government,” Dean of Students Gail DiSabatino says. “As I talked with some older students and young alumni recently, they attributed their start in becoming involved on campus to Tyler.

“Tyler was an excellent leader. He cared greatly about Georgia Tech, his family and his country. These values will be his legacy. He made a difference in many people’s lives, including mine,” DiSabatino says.

His brother-in-law, Walker Houk, told the Atlanta Journal-Constitution, "I think in 26 years he touched more lives than most people do in their entire life."
WREK On the Air

Georgia Tech student radio station WREK is broadcasting from new studios in the Student Center Commons, formerly the campus bookstore. The station made the move on July 27.

The student-operated station had broadcast for years from the cramped confines of the Human Resources Building, but after the bookstore moved to Technology Square last spring the Institute allocated 1,330 square feet for the station. The excitement of the move was tempered by a realization that the antiquated analog equipment — some of it more than 30 years old — had to be replaced by an up-to-date digital format.

A fund-raising effort raised about $43,000, far short of the estimated $150,000 necessary to purchase equipment.

“That’s where our alumni literally rolled up their sleeves and went to work,” Rosemary Wells, chair of the radio communications board, says. “Two former chief engineers, Jim Evans (EE 74) and Thomas Hildebrandt (CS 03, MS CS 04), contributed hundreds of hours of work, which allowed us to drop about $40,000 worth of labor charges. They were there any hour of the day and night. They pulled wires, they installed the telephone system, they rebuilt some equipment, they even built some equipment from scratch. Without their commitment, we wouldn’t be on the air.”

Former general manager Glenn Sirkis, IM 74, says even more help is needed to provide a digital link from the studio to the transmitter.

Tech graduate student Richard Cross, left, listens as alumnus Thomas Hildebrandt makes the first broadcast from WREK’s new studios in the Student Center Commons.

GTRI Celebrates 70 Years

The Georgia Tech Research Institute celebrates 70 years of research this year. Originally called the Engineering Experiment Station, the organization was chartered by the Georgia Legislature in 1919 to support the state’s industry with high-quality engineering research, develop its natural resources, industries and commerce and assist with national programs of science, technology and preparedness.

Funding became available and work began in 1934, with a trio of engineers, a $12,000 budget, lots of ingenuity and entrepreneurial engineering know-how.

Renamed the Georgia Tech Research Institute in 1984, it is the nonprofit applied research arm of Georgia Tech, supporting more than 200 clients including federal, state, local and international government agencies, industrial firms, academic institutions and private organizations.

GTRI now employs more than 1,200 researchers and support staff and brought in $134.9 million in research awards during the 2003 fiscal year. GTRI also is one of the few research and development institutes in the country that is still affiliated with a university, offering real-life work experience to about 250 graduate and undergraduate students each year.
Georgia Tech opened its $45 million Campus Recreation Center in August.

The CRC features an enclosed Olympic swimming pool and diving well, a leisure pool with a 184-foot water slide, current channel, hot tub and sun patio, a three-story climbing wall and a cafe that overlooks the leisure pool. Two floors were added above the pool to allow for six basketball courts, exercise studios, a roller hockey rink and an elevated jogging track. The renovations increase the indoor recreational space to about 300,000 square feet, three times more than the old facility.

“The Olympics provided us with a great swimming and diving facility, but there was one big problem — it wasn’t enclosed. That meant that we could only use the pools four or five months out of the year,” says Mike Edwards, director of Campus Recreation.

The restrictions meant Tech’s swim team had to find someplace else to practice during the fall and much of the spring semester. It also meant that Tech couldn’t host swim meets. Now that renovations are complete, Tech is scheduled to host both the ACC swimming and diving championships next February and the NCAA men’s swimming and diving championships in March 2006.

The leisure pool is a departure from traditional university recreation centers. “Not everybody’s a competitive swimmer,” aquatic manager Debbie Dorsey says. “The leisure pool gives noncompetitive swimmers a way to participate and offers graduate students with families a place to play.”

The fitness area features treadmills and elliptical bikes with TVs imbedded in each one and more than 15,000 pounds of weights, according to Jon Hart, GIT FIT manager for Campus Recreation. Four racquetball courts and one squash court are adjacent to the fitness floor as is the three-story climbing wall.

“We had many freshmen wander in here with their parents over the summer who were amazed at our new facility,” Edwards says. “They say it’s wonderful that they’ll be able to come here to take their minds off the stresses of being a student.”
Hybrid Vehicle

Ford Motor Co. president Nick Scheele, second from left, joined Georgia Tech President Wayne Clough, right, on campus Aug. 17 to give a preview of the 2005 Ford Escape Hybrid, billed as “the world’s cleanest, most fuel-efficient SUV.” Scheele also met with students who work on Tech’s FutureTruck, a standard Ford Explorer that the team transformed into a hybrid gas/electric vehicle to compete against other universities over the summer. Tech’s team took third place in the finale of the five-year FutureTruck competition series in June at Ford’s Michigan Proving Ground. Later Scheele toured the Ford Environmental Science & Technology Building and fielded questions from engineering students.

Olympic Medal

Eric Giddens, Biol 98, who competed in kayaking at the 1996 Olympic Games in Atlanta, coached his wife, kayaker Rebecca Giddens, to a silver medal in the women’s kayak single category at the Summer Olympic Games in Athens. He is the son of Don Giddens, dean of the College of Engineering. Rebecca Giddens, a Georgia State University alumna, was the women’s K-1 world champion in 2002 and the bronze medalist at the 2003 world championships and finished seventh at the 2000 Olympics in Sydney. She is a five-time U.S. national champion and a four-time USA Canoe/Kayak Athlete of the Year. She also coaches the U.S. junior kayaking team. The Giddens live in San Diego.
The Sam Nunn School of International Affairs at Georgia Tech suspended its study abroad program in China after Tech associate professor Fei-Ling Wang was detained by Chinese state security agents and charged with espionage.

After visiting officials at Fudan University in southern China on July 25, Wang, who teaches in Tech’s School of International Affairs and directs the study abroad program, was returning to Shanghai when he was arrested.

“I was searched and put in solitary confinement for four days in a windowless room somewhere in southwest Shanghai,” Wang says. “I was denied water and food at times and my sleep was routinely interrupted and deprived.

“I was interrogated by six officials from the Shanghai State Security Agency but they refused to identify themselves. My interrogators threatened to put me in jail for 10 years and demanded a confession of my ‘crimes against China’ and my ‘ties with U.S. intelligence agencies.’ They tried endlessly to trick me and force me to confess that I had somehow endangered Chinese state security, that I was working for the CIA, FBI or the Defense Intelligence Agency and that Tech’s exchange programs had evil purposes other than education.”

Wang’s wife reported him missing after he failed to return to Atlanta on the planned day. She contacted U.S. diplomats, who asked Chinese officials of his whereabouts, but they refused to answer.

Wang was born in China but is a naturalized U.S. citizen.

“The state security police think that Chinese-Americans are ‘not really Americans’ so they think they can manipulate and abuse them with no fear of retribution,” Wang says. “I was scared at times, fearing for my physical safety and even my own life, and I was very concerned about what they would do to my relatives, friends and colleagues in China.”

Wang thinks he was detained because of his research of hukou, the Chinese household registration system.

He says his interrogators were surprisingly well informed about his research and mentioned it frequently throughout his detention.

After two weeks of confinement, Wang was deported on Aug. 9 and barred from returning to China for five years by the Chinese Foreign Ministry.

Georgia Tech and the U.S. State Department continue to investigate the incident, while Wang has filed a formal appeal of his deportation with the Chinese government.

In a letter to his peers at three Chinese universities, Wang wrote:

“The Sam Nunn School of International Affairs at the Georgia Institute of Technology has been running an eight-week-long summer program in China studying Chinese political economy since 1996. It has contributed considerably to the mutual understanding and cooperation between Americans and Chinese.

“Unfortunately, recent events and discoveries have forced us to painfully recognize that we do not have adequate academic freedom and personal safety in China to continue our program. It is therefore my deep regret to inform you that we have decided to suspend our summer program in China.”

Wang says he remains hopeful that the summer abroad program in China can be resurrected.

“I believe the Chinese political leadership has the courage and wisdom to sufficiently address and correct the mistakes and abuses of the Shanghai state police,” he says, “I remain hopeful because of China’s epic reform and development in the past two decades and am still optimistic about the future of that great nation.

“I am a proud American, a proud Chinese-American,” he says. “I also love China with my heart and soul and I believe that small reactionary elements cannot stop the train of history. Freedom is ringing louder in China every day.”
Ovarian Cancer Institute Relocates to Georgia Tech

When Georgia Tech hired geneticist John McDonald as chair of the School of Biology, he brought the Ovarian Cancer Institute with him.

The institute’s new home on the Tech campus officially opened Sept. 8 and is the center of research for development of a simple diagnostic blood test to detect ovarian cancer in its earliest stages, as well as find more effective therapies to treat the disease and diminish its rate of recurrence.

Every year more than 27,000 women are diagnosed with ovarian cancer, but only about one-third of them survive more than five years. Because there is no diagnostic test for ovarian cancer and no obvious symptoms manifest until late in its development, about 75 percent of cases are detected at Stage 3 or later when it has spread throughout a woman’s abdomen. At that late stage, extensive surgery and chemotherapy are required, with no assurance of lasting success.

If the disease is diagnosed and treated at Stage 1 when it is confined to the ovaries, the survival rate is about 85 percent.

Researchers at the institute, headed by McDonald, are working with doctors, including noted Atlanta gynecologic oncologist Benedict B. Benigno of the Southeastern Gynecologic Oncology Group, to solve the diagnostic problem. The partnership provides scientists and researchers with access to a significant number of high-quality tissue samples, complete with medical histories.

“On average our practice performs at least one surgery each day for ovarian cancer. The result is a continual stream of high-quality and documented tissue samples for our broad research agenda,” Benigno says. “We are searching for ‘markers’ that will lead to an affordable diagnostic test, as well as developing much more refined chemotherapy approaches based on new molecular profiles of ovarian cancer subtypes that may respond differently to treatment.”

The OCI Laboratory draws on the combined expertise of scientists and bioinformaticists from major Georgia universities and colleges. This multidisciplinary approach means that researchers with different backgrounds and approaches can apply their expertise to the same sample and compare results to rapidly gain new insights and understanding.

OCI, which was previously located at the University of Georgia, includes researchers from Tech, UGA, Georgia State University, Emory University, the Medical College of Georgia in Augusta and Clark Atlanta University and includes the fields of biochemistry, medical chemistry, molecular biology, molecular medicine, genetics, nutrition, statistics, mathematics, bioinformatics, computer science and veterinary medicine.

“By weaving together a variety of disciplines into a tight network of world-class researchers we have the opportunity to rapidly advance the science associated with ovarian cancer.”

By weaving together a variety of disciplines into a tight network of world-class researchers we have the opportunity to rapidly advance the science associated with ovarian cancer.”

GT

John McDonald heads the Ovarian Cancer Institute at Georgia Tech.
With one foot in academia and the other in the marketplace, Georgia Tech's VentureLab advances the commercialization of innovative technology and helps faculty and students launch high-growth companies.

By T.J. Becker • Photos by Gary Meek

Georgia Tech was a great exporter of talent for many years. Even though Atlanta was a commercial hub, its lack of high-tech jobs forced graduates to migrate to other regions.

Hal Calhoun, a managing director at the Silicon Valley venture capital firm Menlo Ventures, earned his doctorate in electrical engineering from Tech in 1993.

“I would have liked to have stayed in Atlanta, but at that time, there were very limited choices for jobs in the high-tech community,” Calhoun says.

Today it’s a different story. Atlanta’s technology base is beginning to take off. “Georgia Tech is playing a big role in that,” says Calhoun, referring to the Institute’s efforts to stimulate technology transfer and entrepreneurial activity.

GTronix, launched in 2002, is a perfect example. GTronix is commercializing an analog semiconductor technology developed in Paul Hasler’s lab at Tech’s School of Electrical and Computer Engineering. The company’s technology platform can provide enhanced functionality for wireless devices while dramatically reducing power consumption.

In July, GTronix closed on a significant round of seed funding from Menlo, which has $2.7 billion under management but doesn’t often invest in such young companies.

“Granted, we fund companies at all stages of maturity,
but this is as early as it gets," Calhoun says. Yet GTronix's strong market potential — lowering power consumption by orders of magnitude — helps offset the risk inherent in an early-stage company, he says.

GTronix is the product of VentureLab, one of Georgia Tech's newest tactics for advancing technology commercialization. A unit within the Office of Economic Development and Technology Ventures, VentureLab helps faculty and students create high-growth companies from innovations developed through Tech's $375 million research program.

"Part of Georgia Tech's overall mission is to be a hotbed of innovation and innovation implies commercialization — taking discoveries into society where they can have impact," Provost Jean-Lou Chameau says. "Although a work in progress, VentureLab is making us much more proactive in moving research from the laboratories to the community."

VentureLab staff members scout the campus for promising technologies that might otherwise remain in the lab because researchers are too busy to tackle commercialization or don't know how to begin the tech-transfer process.

"We have one foot in academia and one foot in the marketplace," says Steve Derezinski, VentureLab's director. "We meet with faculty and graduate students on a regular basis so they understand what's required to form a company. And we look at the marketplace to determine if there's real potential for the technology."

In addition to determining the best route for commercialization, VentureLab helps faculty identify the right marketplace and where to enter it. "The last thing you want to have is a great platform and then scatter it everywhere," says Young Kim, Phys 87, a former VentureLab staff member who is now GTronix's CEO. "You need to focus on a specific market opportunity."

That kind of market research doesn’t come cheaply, so the Georgia Research Alliance VentureLab, the umbrella organization for Tech's VentureLab, helps support technology validation and prototypes. Grants of up to $50,000 are available to assess market demand and awards of up to $100,000 are available to develop a working prototype.

In another key service, VentureLab matches faculty members with experienced entrepreneurs and managers who can drive the commercialization process forward. In some cases, these VentureLab fellows may become a company's first chief executive.

Professional management makes a big difference in a company's growth, says Madhavan Swaminathan, a professor in the School of Electrical and Computer Engineering. Swaminathan and four other researchers in Tech's Microsystems Packaging Research Center are commercializing an integration technology for radio frequency passive components used in wireless telecommunications products. With help from VentureLab, they formed Jacket Micro Devices in 2002.

VentureLab grants helped JMD prove its concept by building prototypes to test and qualify the technology. Yet the startup gained real momentum when VentureLab fellow Jim Stratigos, EE 74, MS EE 80, joined JMD as its chief executive in February.
“As soon as Jim came on board, we got our funding,” says Swaminathan, explaining that the researchers had been trying to win institutional capital on their own for nearly two years. One month after Stratigos joined their company, JMD received term sheets and closed on funding in June.

“We are technologists, and venture capitalists invest in a business, not a technology,” Swaminathan says. “Jim helped us strategize better and convey our strategy to investors — that made all the difference.”

JMD is now a member of Tech’s Advanced Technology Development Center, a sister entity under EDTV that helps Georgia entrepreneurs launch and build successful companies.

In fact, ATDC originated the VentureLab concept in 2001, recognizing that faculty needed a special support mechanism for commercialization.

“Faculty members either weren’t pursuing commercialization or they weren’t able to build companies to a point that they were ready to move into ATDC,” says Wayne Hodges, vice provost of EDTV. “We believed that the earlier we could get involved, the greater the chance that faculty startups would be sustainable.”

ATDC statistics already reflect an uptick in technology transfer. Compared to 14 percent of previous ATDC companies that were founded by a faculty member, 19 percent of current ATDC companies have a faculty founder. And whereas 12 percent of previous ATDC companies licensed intellectual property from Georgia Tech, 22 percent of current ATDC companies are licensees.

In addition to GTronix and JMD, two other VentureLab startups — Stheno Corp. and Orthonics Inc. — closed on institutional funding this summer. Together, the four companies received more than $6 million in venture capital.

**ATDC Expansion**

Beyond VentureLab, EDTV has been working on other initiatives to strengthen Georgia’s entrepreneurial environment. ATDC opened a satellite operation in Warner Robins in 1991, followed by offices in Savannah in 2002 and Columbus in 2003.

In August 2003, ATDC moved its headquarters to Technology Square, Georgia Tech’s new multibuilding complex in Midtown. This change of venue gives both the incubator and its member companies unprecedented visibility.

ATDC’s previous headquarters on 10th Street isolated the incubator from the community. Now it’s in the thick of things, next door to the Georgia Tech Hotel and Conference Center, which makes it easy for ATDC members to participate in technology-related events held there and easier to interact with customers and investors. ATDC can partner better with its sister organization, the Economic Development Institute, which is just a couple of blocks away. And its new proximity to the College of Management raises ATDC’s profile with students, the next generation of entrepreneurs.

“By being in Technology Square, we’re in a targeted area for exposure,” says Bird Blitch, ISyE 97, co-founder of BroadSource, a provider of telecommunications management software. “Businesses revolve around people. Employees like working here, customers like coming by here.”

BroadSource joined ATDC last summer and has been
flourishing. It has strengthened its senior management team and closed on $5.7 million in funding. And though BroadSource did not emerge from VentureLab, “Georgia Tech has played a key role in who we are,” Blitch says, noting that about half of BroadSource’s employees and its entire management team are Tech alumni.

Technology Square improves the ability of ATDC members to interact. There are 18 startups on a single floor. The proximity sparks synergy in a variety of ways, from problem solving to psychological support.

“If you’re having a bad day, but then see someone down the hall get funding, it gives you hope,” says Tripp Rackley, ISyE 92, chairman and CEO of BroadSource. “Collaboration is one of the things that drives entrepreneurship and Tech Square fosters a collaborative environment unlike anything I’ve ever seen in other cities.”

Image is also important for a high-growth company, Rackley adds. “But you have to walk a fine line. You don’t want to be in the Taj Mahal, but you don’t want to be in a space that looks like someone’s basement.”

ATDC’s physical space at Tech Square appears polished and professional without going overboard, he says. “When you walk into ATDC, it gives you a feeling of success.”

Bolstering Biotech

In spring 2003, EDTV opened the ATDC Biosciences Center, a unique facility geared to provide special equipment and resources for bioscience startups.

This satellite incubator is located in the Ford Environmental Science & Technology Building, a new research center that’s part of Tech’s Life Sciences and Technology Complex. Because it is housed in a major research building, the ATDC Biosciences Center breaks down physical barriers. Its location enables entrepreneurs and university faculty — individuals who are typically isolated from each other — to work together.

For example, Stheno Corp. is an ATDC company that is commercializing a chemical-detection technology to find impurities in pharmaceutical processing and production lines. Formed with VentureLab assistance, Stheno’s technology was developed in Andreas Bommarius’ and Rick Trebino’s labs, and the two professors serve as Stheno’s scientific advisers.

“Our offices are just a short walk from their labs, which makes it easy for them to stay involved,” says Bill Edens, Stheno’s CEO.

Being close to other biotech entrepreneurs has helped Edens solve a number of problems. When a machine shop delayed Stheno’s order for a month, putting project deadlines in jeopardy, an ATDC member suggested an alternative supplier — one that specialized in smaller orders and wouldn’t bump Stheno for a larger order.

“Now when I start to look for vendors or suppliers, it’s my normal procedure to walk the halls and ask for referrals,” says Edens. “It’s a huge time saver.”

Stheno, admitted into ATDC this summer, came onto VentureLab’s radar screen when Edens, who was completing a master’s degree at Tech, won second place in a business plan competition sponsored by the College of Management. In addition to winning a $30,000 service package, the award ticked off a chain of support. Stheno was accepted into the VentureLab program, which helped the startup secure a Small Business Innovation Research grant from the National Science Foundation and prompted William Oakes, AE 59, one of the competition’s judges, to become an early investor.

“When you’re putting together a business, there are a variety of resources you need,” Edens says. “It’s not simply a matter of assembling pieces, for you must first find those pieces. Georgia Tech has made it possible to get the resources we needed.”

Continuing Momentum

This summer ATDC received an Excellence in Economic Development award from the U.S. Commerce Department’s Economic Development Administration.

“Although ATDC is recognized as a leader in incubator circles, the EDA award represented broader recognition that we’re helping create high-paying technology jobs,” says Tony Antoniades, ISyE 91, ATDC’s general manager. “The award gives us more visibility on a national front and outside of incubator circles.”
Other positive indicators in Georgia Tech’s quest to encourage high-tech entrepreneurs include:

Greater investment in ATDC companies with a Tech connection (either through a faculty or alumni founder or a licensing agreement). In 2003, venture capital for these companies totaled $50 million, up from $17.2 million in 1999 and $5.5 million in 1998.

Invention disclosures, issued patents, startup formations and licensing deals have all been increasing, reports Tech’s Office of Licensing Technology.


“Research dollars are directly correlated with startup activity,” says JMD’s Stratigos. “The more Georgia Tech is able to attract research dollars, the better it is for the technology startup community.”

Entrepreneurial-minded faculty is an important aspect of technology infrastructure. Hodges says Roger Webb, chair of the School of Electrical and Computer Engineering, is a strong advocate of technology transfer. A number of VentureLab companies, including JMD and GTronix, stemmed from technology developed in ECE labs. Four ATDC companies among the top 25 venture-capital deals in Atlanta for 2003 — Nexidia, CardioMEMS, EGT and Lancope — originated from ECE research.

“Roger really understands the commercialization process and encourages those faculty members who want to participate,” Hodges says.

In addition to leading to jobs for graduating students, faculty startups provide a good opportunity for existing students to work on technology, Webb says. “Part of Georgia Tech’s mission is economic development, and faculty commercialization of the products of faculty research is one way to foster economic development.”

Tech has evolved from an undergraduate center to a graduate research institute, Webb says. “That’s been important in attracting research dollars and faculty to do that research.”

And though VentureLab is still in its infancy, the program is already winning kudos as an important mechanism for technology transfer.

“VentureLab is one of the big reasons I came to Georgia Tech,” says professor Barbara Boyan, a GRA eminent scholar who is commercializing new biomaterials for spinal disc repair.

Steve W. Chaddick, EE 74, MS EE 82, senior vice president and chief strategy officer for CIENA in Atlanta, says, “We have an incredible opportunity with VentureLab. What makes a technology school great is not just the quality of the faculty, but also the economic impact it has on the region.”

With greater funding and support, Chaddick, who has invested in VentureLab companies, believes the organization could triple its impact and turn out 10 companies a year instead of two or three.

Simplifying the process for licensing intellectual property would also help.

“Technology has a shelf life and that shelf life is shorter than it was five years ago,” Stratigos says. “Today it’s measured in months rather than years.”

Yet there are reasons for caution, says George Harker, director of OTL and assistant vice provost of EDTV. For one thing, the Institute has a certain amount of risk, such as recouping patent costs, which aren’t cheap.

OTL performs a “balancing act” among a variety of stakeholders.

“We’re not trying to squeeze the last nickel out of a deal, we just want to make sure everyone, including the university and faculty who may not be joining the new company, gets a fair deal,” Harker says. “I want investors to make money because I want them to come back and fund more companies.”

OTL and VentureLab regularly work on new procedures for improving communications and the commercialization process.

“We want to create a smooth process on both sides,” Hodges says. “For investors and companies interested in licensing our technology, we’re trying to create an easier path into the university — along with an easier path for faculty to take their technology into the community.”
Here’s a quick look at three Georgia Tech-affiliated startups in various stages of advancing toward commercial success — Orthonics, a current VentureLab member, Qcept Technologies Inc., VentureLab’s first graduate, and EG Technology, an ATDC graduate.

Launching Orthonics

Formed in December 2003 through VentureLab, Orthonics is developing novel biomaterials for spinal disc repair and regeneration that incorporate several Georgia Tech technologies including research from the lab of Barbara Boyan, a professor and Georgia Research Alliance eminent scholar.

“Orthonics would not exist if weren’t for VentureLab — at least not in its present form,” says Steve Kennedy, a VentureLab fellow who now serves as Orthonics’ chief executive.

Launching any new company is difficult, but biotech startups have particular challenges. “It takes a long time to get to market and a lot of money,” Kennedy says.

Commercializing a medical device — the classification that Orthonics falls under — typically takes three to five years and $25 million in funding. For drugs, the time frame and investment requirements are even greater.

That means traditional bootstrapping isn’t a possibility and investors are a must. Before a startup can even hope to attract investors, it must have proof of concept.

“One of the biggest services VentureLab performs is providing pre-seed capital that allows you to prove your technology and be taken seriously by investors,” Kennedy says.

Orthonics has received two VentureLab grants totaling $150,000, which led to funding from Viscogliosi Brothers LLC, a New York-based venture capital and merchant banking firm that focuses on the musculoskeletal and orthopedics industry.

Boyan, who was involved in faculty commercialization at other universities, says VentureLab was a key factor in her decision to join Tech in 2002. “The whole technology transfer phenomenon here is refreshing.”

Boyan’s office is in the Parker Petit Institute for Bioengineering and Bioscience, next door to Orthonics’ location in the ATDC Biosciences Center.

Boyan also counts VentureLab fellows as a big plus. “I had to be the person that ran my company before,” she says. “And no one can do it all. Something has to give and usually that means your research program. VentureLab allows me to do what I do best — be the scientist and professor. I didn’t have to change my lifestyle.”

Qcept Technologies

Qcept Technologies Inc., VentureLab’s first graduate, is developing surface measurement solutions for semiconductor manufacturers.

The company’s technology, which rapidly inspects and measures uniformity and chemical variation on semiconductor wafers, was developed by Steven Danyluk, a professor in the School of Mechanical Engineering and director of the Manufacturing Research Center.

“VentureLab helped validate our legitimacy as a high-tech startup,” says Bret Bergman, Qcept’s president and CEO.

Although Danyluk was highly respected in academic circles, this was the first time he had commercialized technology, Bergman says. In the last six months Qcept has closed on $4 million in second-round funding, expanded its board of directors, recruited semiconductor industry veteran George Deltoro as senior vice president of engineering and shipped its first commercial product.

Revenue will be under $500,000 this year, but Bergman expects that figure to triple in 2005. Qcept’s initial product is a tabletop wafer inspection system for lab and preproduction inspection.
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The “holy grail,” says Bergman, is to incorporate Qcept’s technology into production line systems, which will generate higher revenue.

Admitted to ATDC in June 2002, Qcept has benefited from ATDC membership in a number of ways, such as the ability to attract seasoned talent like Deltoro.

“One of the most important intangible benefits is ATDC’s camaraderie — being around other startups as you go through ups and downs,” Bergman says.

An entrepreneur who has worked with five previous startups in Boston and the Silicon Valley, Bergman moved to Atlanta in 1997.

“I’ve never seen an incubator of this quality in any region I’ve worked in,” he says. “When customers or investors come to visit us at Technology Square, they’re very impressed by the professional image — we don’t look like a hayseed organization. That gives large, well-heeled companies the confidence to do business with you.”

EG Technology

A recent ATDC graduate, EG Technology improves digital-video transmission by boosting bandwidth efficiency in the “last mile” — the point when data moves from the network backbone and into the home. Using advanced compression techniques, EGT’s digital encoders enable network operators to deliver more channels in a given amount of bandwidth — essentially “pumping up” thin pipes to yield higher capacity and lower costs.

Although EGT predates VentureLab, its origins represent the kind of matchmaking that occurs within ATDC halls.

Early in 2000, serial entrepreneurs Bill Hogan, Phys 78, and Greg Nicholson began looking for a new technology to commercialize, and ATDC introduced them to Nikil Jayant, a professor in the School of Electrical and Computer Engineering and a GRA eminence scholar.

The three men discovered that they had been working on the same problem, only from different perspectives. Joining forces, they launched EGT in October 2000 and the company was admitted into ATDC three months later.

Hogan, EGT’s chief operating officer, praises ATDC’s peer-learning network. “Even if they’re in different industries, startup companies experience similar problems. ATDC provides an environment where interaction can take place and entrepreneurs can help each other.”

ATDC membership was especially helpful in EGT winning its first round of funding, Hogan says. “Otherwise, as a startup, you’re selling yourself and a concept.”

EGT began shipping commercial products in September 2003. Today the company has sold more than 500 video encoders in seven countries with a number of repeat customers. Hogan says the company will soon launch new products and should generate $8 million to $10 million in revenue this year. GT
President Wayne Clough heads the “Engineer of 2020 Project” by the National Academy of Engineering’s Committee on Engineering Education — an effort to envision the future, predict the roles of engineers and characterize the Ingenious Engineer of 2020.
Nobody knows what the future holds, but let’s say it turns out to be a nightmare — a world ensnared in a treacherous global war. In 2013, terrorists explode a bomb in Washington, D.C., instantly killing the president of the United States, key members of his administration and a number of world leaders. The U.S. populace awakens to realize the lull in terrorism on its mainland since Sept. 11, 2001, was illusionary.

That horrifying possibility was studied as a viable scenario by the National Academy of Engineering’s Committee on Engineering Education chaired by Georgia Tech President Wayne Clough.

It was one of several scenarios considered by the NAE committee as it sought to posture engineers in a realistic near future. In addition to a world caught in global conflict, other scenarios envisioned the optimistic future of a world inspired by the next scientific revolution, a world confronted with devastating natural disasters triggered by climate change and the world of 2018 coping with breakthroughs in biotechnology that yield enormous benefits to humankind on one hand and, on the other, insurers threatening a worldwide pandemic.

The dramatic, mind-expanding landscape of scenario-based planning exercises moderated by futurist Peter Schwartz, co-author of “The Art of the Long View,” was part of a two-year effort by the committee to discover a new vision for engineering and the role of the engineer in 2020. Schwartz, co-founder and chairman of Global Business Network, is known for developing strategies for alternative perspectives of the future.

In a globally interconnected world that is shaped socially, politically and economically by accelerated technological innovation that has become a seamless and indispensable part of everyday life in 2020, the engineer would seem to be in his element.

Even so, Clough says the NAE aspires for engineers of 2020 to be more than competent technicians. That world will need ingenious leaders — ingenious engineers. The opportunity arises for colleges and universities to prepare Renaissance engineers — analytical, business savvy leaders who are effective communicators, creatively inventive and endowed with practical ingenuity.

Educating future engineers requires a comprehension of the kind of future they will inherit. Those conclusions were drawn in part from scenario-based planning.

“IT sounds simple, but it’s profound once you do it. You’re trying to predict the future,” Clough says. “Everybody who has tried to do it got it wrong.”

Clough recalls that in 1977 IBM founder T.J. Watson thought the world might need five or six computers at most, while Ken Olsen, founder of Digital Equipment Corp., could foresee no reason anyone would ever need a computer in his home and Bill Gates was overheard to say in 1981 that “640k of memory ought to be enough for anybody.”

The planning exercises required the committee to create a variety of scenarios that could occur, none of which might occur. “As you think through those, it causes you to develop a much more flexible approach to your strategy,” Clough says.

It also eliminated the need for a consensus view of a single future and opened thinking that considered multiple possibilities and stimulated “vigorous discussions and debate” among some of nation’s top engineering and scientific minds.

“Engineering historically responded after the fact to changes in society and changes in the nation and the notion was that somehow we would catch up to those changes,” Clough says. “That mode might not work anymore.”

The first phase of the NAE initiative promoting engineering education reform, “The Engineer of 2020,” was completed in May.

The second phase, now underway, evaluates engineering education and how to prepare students for a future fraught with social and ethical issues ranging from global competition, personal privacy, transgenic food, instant communication and fantastic technological breakthroughs.

Clough says it is imperative that engineering education anticipates the future rather than reacts to the past.

“You want to prepare engineers for life, not for a job,” Clough says. “Clearly you want them to do a job, so you can’t ignore the fundamentals. At the same time, you want to teach them a way of thinking and to broaden their education.

“The education we provide engineers must prepare them to move beyond merely fulfilling a technological function and become leaders who make wise decisions about technology and set policies that foster innovation.”

In its executive summary, the committee says future engineers should be broadly educated, ethically grounded individuals who see themselves as global citizens, capable of being leaders in business and public service.

For the engineering profession to take the initiative in defining its future, the committee said it must foster a vision,
Dramatic Approach
Tech freshmen solve problems like engineers

A group of eight freshmen biomedical engineering students assemble in a “war room” in the Whitaker Building to determine what recommendation they will make to a congressional committee on the scientific validity of a discrimination charge based on genetic profiling.

Welcome to BME 1300 and a world of problem-based learning. In their first semester in biomedical engineering, the students are introduced to unsolved problems on the cutting edge of science, says Wendy Newstetter, director of learning science research in biomedical engineering.

Don Giddens, dean of the College of Engineering, says it has been unusual to offer engineering courses to freshmen. Traditionally, students spend their freshman and sophomore years doing the required math and science coursework and their junior and senior years in their engineering fields, he explains.

The course is engaging, he says. Giddens got firsthand experience when he facilitated a problem-based learning team that was working on an assignment to determine how to protect the nation’s blood supply against mad cow disease.

“It was a real issue and it was topical,” Giddens says.

Newstetter says problem-based learning is taught at both the graduate and undergraduate levels.

Each class is limited to nine students and 10 teams work on the same problem simultaneously, she says.

Women make up 50 percent of the classes.

“Problem-based learning models real world environments where the problems are messy, open-ended, ill-constrained and have no structure to them.”

For example, one problem concerns treatment for Huntington’s disease, a degenerative brain disorder for which there is no effective treatment or cure.

“Your group has been hired by a venture capital firm for investment advice. They are evaluating three companies that are each developing different treatment strategies for Huntington’s disease. One is developing a fetal tissue implant strategy, another a stem-cell implant strategy and a third a gene therapy strategy. The venture capital firm only has enough capital to invest in one of these three companies. Your job is to advise this firm on which strategy has the greatest potential for success.”

In addition to making a recommendation for investing in one of the companies based on an understanding of the genetics of Huntington’s disease, the students were required to give the pros and cons of each treatment strategy and a detailed explanation of how the chosen strategy could fight the disease.

“They are given a problem and, because they are freshmen, they don’t have any expertise in this area. So any expertise that they develop, they have to do by themselves,” Newstetter says.

“They work in teams. They have to solve three problems every semester. There are a lot of components to this. They develop inquiry skills. We give them no resources to solve these. They must find all of the resources themselves. They have to go out and do all of the research on their own. They learn very early on how to use academic databases to become very good at doing research.

“What we are trying to do is train them to solve problems like engineers,” Newstetter says. “They love it.”
transform engineering education to achieve its vision, build a clear image for new roles for engineers in the minds of the public and prospective students, accommodate innovative developments from nonengineering fields and focus the energies of the different disciplines of engineering toward common goals.

“If the United States is to maintain its economic leadership and be able to sustain its share of high-technology jobs, it must prepare for a new wave of change,” the committee says. “Innovation is the key and engineering is essential to this task, but engineering will only contribute to success if it is able to continue to adapt to new trends and educate the next generation of students so as to arm them with the tools needed for the world as it will be, not as it is today.”

During the past generation, the engineering profession has experienced gut-wrenching change. A generation ago, a typical engineering career might have followed a linear trajectory characterized by upward mobility and advancement. An engineering graduate might start with technical work, move to creative design work and on to technical manage-
ment and general management — all in one company.

Phil Condit, CEO and chairman of Boeing, who participated in an “Engineer 2020” workshop, says that was typical of his generation.

“When I started my career, we were signing time cards every day,” Condit says.

But no more, he says. For the vast majority of engineers, the days of spending a lifelong career with one company are long gone. Engineering graduates today are told that a typical work pattern could involve six or more career changes — often lateral changes, not advancements.

Condit advises engineering graduates to adopt career strategies accordingly.

“Don’t plan your career,” Condit says. “Understand where you are. Get those basic skills and then stay open to opportunity. As I look back, I could not have predicted the path I took. Second, follow your passion. Do what excites you. To sort of follow a path that says, ‘I think this particular area will have the highest salaries or this area is going to have the biggest rewards’ is not where success will come. It will come because you follow your passion. It is to do something that really excites you. And you are always looking for opportunities.”

Condit says it is important that engineering reflect diversity. “It is diversity that makes a business rich. It is an important attribute. One of the jobs we have to do is make the engineering profession exciting. People tend to go where they see opportunity. If we look at the opportunities, the things that technology can bring to us and put forward that broader view, I think we can attract a very broad, a very diverse set of people into engineering.”

The engineering profession should conduct a broad public relations campaign aimed at a young audience, Condit says. “We’ve got to be in grammar schools talking about the excitement of engineering.”

Clough says engineering education needs to be more creative.

“We’ve got to think more than just in terms of a fixed curriculum. There are areas where we want to have an interdisciplinary approach. Sometimes we can do that easier than we think. If you look at the names of our departments at Tech, you can see change going on — electrical engineering has become electrical and computer engineering, chemical engineering is now chemical and biochemical engineering. It is becoming interdisciplinary,” he says.

A somber reality is that engineering school enrollments in the United States have been dropping for the past several years and are down about 20 percent from the 1980s. Although Georgia Tech has successfully bucked that trend, the majority of colleges and universities have not. That does not bode well, Clough says.

“The United States is headed for a train wreck if we don’t do something about it,” he warns.

U.S. engineering education stands to be marginalized if the nation is passive, Clough says. The country must produce engineers who are decision makers who understand technology and innovation.

China and India, each with populations of more than 1 billion, are emerging economic competitors, Clough observes.

India, the No.1 outsourcing destination for Western companies, churns out 290,000 computer-literate engineering graduates a year, joining more than 2.1 million working engi-
Tech High Begins Inaugural Year

By Maria M. Lameiras

Georgia Tech alumni have been instrumental in creating Tech High, an Atlanta charter school designed to prepare students for careers in engineering science and technology.

The shuttered SciTrek in Atlanta is the temporary home for the 120 freshmen who make up the inaugural class of Tech High, which is a partnership between the Tech High Foundation and the Atlanta Public Schools and draws its student body from districts within the city limits.

Students who go through the math, science and technology-heavy curriculum to graduate from Tech High will be primed to enter college, technical school or the technical work force at a highly skilled level, according to school organizers.

Kelly McCutchen, Mgt 89, executive vice president of the Georgia Public Policy Foundation, says the organization has been working with Atlanta Public Schools and the Technology Association of Georgia for three years to make the charter school a reality.

"These are kids from all over the city of Atlanta and, as a charter school, we by law have to admit everyone who applies. We have 120 ninth-graders right now. If we go over 150, students are selected by lottery. We suspect there will be a waiting list by next year," McCutchen says. "All students will follow the same college-prep curriculum. Our belief is that all kids can be successful if you have high expectations."

Alan Gravitt, Phys 67, and William Daly, EE 82, MS EE 83, are math and science teachers at Tech High.

"I taught public school for seven years, then I was in research and development for 23 years. Now I'm in my third year back teaching and the idea of a project-based science, math and technology program where the students are interested and have a strong work ethic is superb," Gravitt says.

"Our expectations are going to be high and this is going to take students who are ahead and push them forward while students who are having problems are going to be helped and motivated to excel. We want these students, when they walk out of Tech High, to walk into Georgia Tech or Morehouse or Emory or any other Georgia institution and be ready to start."

The freshman class is using about 17,000 square feet at SciTrek, which closed its doors in August. By 2006, the school, which will add a freshman class each year, will need about 50,000 square feet to accommodate the expected student body of 600, according to school leaders.

Once the current freshmen reach their junior and senior years, they will have opportunities to pursue research in conjunction with Georgia Tech and other technical schools and colleges.

"We have some professors who will be working with students on research and we have mentors and tutors who are Georgia Tech students," McCutchen says. "Once we get the program started, we will focus on replicating it around the state."

As a public-private partnership, the school receives public funds of about $5,200 per student per year from the Atlanta Public Schools, about half the amount of other public schools, and therefore must accept all students. It has raised almost $2.6 million from industry and private donations for facility improvements, technology enhancements and enrichment opportunities for the students. Industry support for the school has come from companies such as Noro Moseley, Scientific Atlanta, EarthLink, UPS, Coca-Cola Co. and Southern Co.

Don Chapman, Mgt 61, chairman of the board of the Tech High Foundation, says he could not be more pleased with the school's start.

"We drew students from all quadrants of the city and that is important. As we grow we will see how we do, but if we can do this in inner-city Atlanta, it can go to the national level. We can replicate this and spread the idea," Chapman says.
neers, according to India’s National Association of Software and Services Companies.

China has a population of 1.5 billion people, according to the New York Times Magazine in its July cover story, “The Chinese Century.” The magazine reports that China has 17 million university and advanced vocational students (up more than threefold in five years), the majority of whom are in science and engineering, China will graduate 325,000 engineers this year — five times as many as in the United States, the magazine says. China’s economy is the world’s sixth largest, with a gross domestic product of about $1.4 trillion.

“We live in a world where global competition is increasing at a very rapid rate — where the Internet is causing things to happen much more rapidly,” Clough says. “The Internet is one of the global economic forces that is changing the world.”

T.L. Friedman, in “The Lexus and the Olive Tree,” defines globalization as the “inexorable integration of markets, nation-states and technologies to a degree never witnessed before — in a way that is enabling individuals, corporations and nation-states to reach around the world farther, faster, deeper and cheaper than ever before the spread of free-market capitalism to virtually every country in the world.”

The world’s economy has been tightly linked by technology. The Internet and a global telecommunications network are creating a new order in which services and information can be provided on one side of the globe and delivered instantly to satisfy demands on the other side, the NAE committee says.

While the United States remains the world’s top producer and a net exporter of high-technology products and ranks among the global leaders in research and development spending, changes in the ongoing economic work force make the future outlook uncertain, according to the National Science Foundation in May.

“The United States is in a long-distance race to retain its essential global advantage in science and engineering human resources and sustain our leadership in science and technology,” says Warren M. Washington, National Science Board chair.

The United States ranks 17th among nations surveyed in the proportion of its 18- to 24-year-olds earning natural science and engineering degrees. In 1975, it ranked third.

Clough says it is clear the United States cannot compete in this economic climate by offering the same old solutions.

“Competition is good and always has been good for this country,” Clough says. “What’s happening in India and China by and large is good. Their middle classes are beginning to develop.

“We in the United States have to recognize those facts and prepare for that future. The advantage of our global competitors is at the end of the spectrum where the processes and products have been standardized and become routine. Our opportunity is at the other end of the spectrum with creative, innovative, high-end products and services that offer higher value. We need to build an economy based on innovation.”

If one side of the coin is competition, the other side is collaboration, Clough says.

“We can find ways to work with India’s engineers and China’s engineers to our benefit,” Clough says. “If the world is going to operate on 24-hour business cycles in the future by shipping information from time zone to time zone, let’s find the best partners we can find in what we do — in India, China, Korea and Europe. There’s a new model out there. We have to develop it and use it to our advantage.”

On the academic front, Clough says through a program with GE Energy, Tech is delivering mechanical engineering degrees over the Internet to Bangalore, India. Tech is also working to establish collaborative programs with universities abroad.

“If we develop collaborative approaches with certain universities in India, China and Europe, we can do things from a research standpoint we could not do by ourselves,” Clough says. “It’s the same relationship we have with Emory University and that works very well. We need to find out how to successfully compete and how to use their growing strengths to our advantage.”

The NAE committee in its report states, “Engineering, through its role in the creation and implementation of technology, has been a key force in the improvement of our economic well-being, health and quality of life.”

The prospect of exciting new developments expected to come from such fields as biotechnology, nanotechnology and high-performance computing make the year 2020 a time of new choices and opportunities, the committee reports.

“The years between the present and 2020 offer engineering the opportunity to strengthen its leadership role in society and to define an engineering career as one of the most influential and valuable in society and one that is attractive for the best and the brightest,” the report says.

“What attributes will the engineer of 2020 have?” the committee report asks rhetorically.

That engineer “will aspire to have the ingenuity of Lillian Gilbreth, the problem-solving capabilities of Gordon Moore, the scientific insight of Albert Einstein, the creativity of Pablo Picasso, the determination of the Wright brothers, the leadership abilities of Bill Gates, the conscience of Eleanor Roosevelt, the vision of Martin Luther King and the curiosity and wonder of our grandchildren.”

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New York Times Magazine

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Fall 2004 • GEORGIA TECH
Bill Goodhew, IM 61, received a Sears Tower developing kit for his 12th birthday and has been hooked on photography ever since.

Goodhew’s hobby has taken him throughout the United States, to Iceland, the Galapagos Islands and, most recently, on a photo safari to Kenya, where he shot wildlife with his Canon 10D in the Masai Mara and Samburu game reserves and Lake Nakuru National Park.

His goal was to capture the “big five” — lions, leopards, hippos, rhinos and elephants. He got those photos and along the way acquired an added appreciation for his life in America and a firsthand lesson in Darwin’s theory of survival of the fittest.

These days Goodhew, an Atlanta resident, former CEO of Peachtree Software and currently a vice president of Intelligent Systems, works exclusively in digital photography. He took some 5,000 photos in Africa, but in his tent at night Goodhew would delete the ones he didn’t think were top-notch. “I didn’t have a computer with me. I had 6 gigabytes of storage, so I reviewed all the pictures and culled a lot of them. I came home with probably 2,000.”

His favorite photographs were the hardest to get.

“The leopard in the tree is probably my favorite. Leopards are very elusive and hard to photograph. We only saw three of them. They stay hidden in the trees and are obviously well camouflaged. It’s real difficult to get a clean shot,” he says.

On one outing during the two-week trip, Goodhew and the fellow photographers in his group spotted the leopard.

“I waited three hours for it to wake up. I was ready to throw a rock,” he jokes, explaining that after being patient so long, he only had a short time to get his shots. “Three minutes after she woke up, she yawned and climbed down out of the tree.”

He also documented a hunting lesson with his camera. A mother cheetah caught a baby gazelle, but didn’t kill it. Instead, she took it to her three cubs to chase and catch over and again until the gazelle was finally killed and eaten.

“That was one of the most fascinating things I saw,” Goodhew says.

He also likes a photograph he took of a type of antelope called a dik-dik.

“They’re lunch for everybody cause they’re so tiny. They are gone in a flash and often all you get is the back of them. They scurried and then looked back. One of the things that’s kinda cool about that picture is if you blow it up, you can see the reflection of the savannah behind me in one of the eyes of the dik-dik.”

After his trips, Goodhew analyzes the photos and sometimes enhances them. “With Photoshop you can diddle around with it and get a very good photo,” he says.

Most of his photos from Africa were so clear that no diddling was required. Every tick in the fur of a lion is visible, which is amazing considering the majority of Goodhew’s
photographs were shot from a truck with his camera perched on a beanbag.

“It’s a wonderful place. The animals don’t even know you’re there. If you get out of the truck, you look like lunch. If you don’t get out of the truck, you look like a truck,” he says.

One cheetah was so used to trucks on the scene that it jumped on top of one to get a higher perch to look for prey. Rhinos, however, aren’t so fond of the tourist transports. Goodhew says when a mother rhino eyed the vehicle as a threat to her baby, the guide knew enough to start the engine and move on.

“Rhinos are very dangerous. They are very belligerent and can knock a truck over. But getting pictures of them with their young is real challenging and fun,” Goodhew says.

Four million wildebeest migrate in East Africa each year and Goodhew was on hand for the seasonal event.

“They mill around like nobody’s in charge and suddenly they decide to cross the river. They don’t look at the other side for a way to get out,” says Goodhew, who was fascinated as he witnessed a couple of wildebeest being swept down the river and killed by crocodiles and another caught by a lioness on the bank.

While the male lions sit around and wait for their mates to bring dinner, other males spend their time wrestling for dominance.

“Giraffes do a dominance process called necking,” Goodhew says, explaining that he photographed two males tussling by twisting their necks around each other and jabbing with their short horns.

He also photographed giraffes splaying their front legs apart in order to drink from a river and impalas standing on their hind legs to eat leaves from trees. “I learned a lot,” Goodhew says.

In order to capture the breathtaking photos, Goodhew and his group would wake before dawn, eat breakfast and leave camp on the safari trucks at daylight.

“Technically we stayed in tents. There’s a concrete floor and the walls are made of a pipe frame. There are two double beds and a bathroom made of stone,” Goodhew says, noting that guests were instructed to ensure that their tents were secure before leaving for the day. “Monkeys get in there and make a mess.”

Creatures were nearly constantly in his viewfinder by day and as he lay in bed at night, he could hear the sounds of lions and elephants outside the camp. Goodhew wasn’t frightened.

“There is an electric fence around the camp. I assume it works. One guy got up one morning and there was a big pile of elephant poop outside his tent,” he says.

The human hosts treated their guests well. “The log structures for the dining room are very nice. It’s not the Ritz-Carlton, but no one would complain about the accommodations. The food is not the Varsity, but there was lots of seafood and chicken and lots of vegetables.

“On the human side, Kenya is one of the more well-off...
The grey crowned crane is anything but dull.
countries in Africa. Yet out of 30 million people, there are only 3 million jobs. There may be only one person in an extended family who has a cash-paying job. AIDS is a big problem. So are tuberculosis and diabetes. Fifty-five percent of the population live below the poverty level of $1 a day. You get a real appreciation for this country,” he says.

Goodhew also developed an appreciation for Iceland during a trip there in 2000, when he brought back 185 rolls of film. The slides he produced from that trip are bulkier than the digital images from Africa, but just as brilliant.

“Iceland is relatively new in geologic terms,” Goodhew says, explaining that a now-serene glacial pool was created from a catastrophic event.

“They had an incredible glacial event in 1893. A volcano 100 kilometers long all underneath the ice erupted. The whole thing blew. It increased the land size tremendously, but it killed a fourth of the population and 90 percent of the plant and animal life and left a layer of ash all over the island. There are all these places in Iceland where the land is strange. It’s weird looking because a volcano put it there,” Goodhew says.

He describes Iceland as a barren but beautiful land. Goodhew photographed a “lonely country church” as he traveled from the glacial pools of the southern coast to the northwest corner of the country to photograph puffins.

“The only place to stay up there is a building that was once a reformatory for bad boys. There are teeny little rooms with bunk beds.”

Goodhew says the lack of creature comforts was worth the trip.

“Puffins have never been hunted there so you can get very close. There are zillions of them.”

The Galapagos Islands, which Goodhew visited in 2002, provide some of the best sites in the world to get up close to birds and land and sea creatures. Most of the islands are part of the Ecuadorian national park system and the species that live there have no fear of humans toting cameras.

“They’re completely tame,” Goodhew says, adding that human visitors are instructed to stay on trails or step around the tortoises, iguanas and birds that may block their path.

Although the Galapagos are protected today, remnants of generations of human stops at the islands remain. Ships
Goodhew came upon this "lonely country church" that breaks up the barren Icelandic landscape during his journey from the glacial pools of the southern coast to the northwest corner of the island.
often laid anchor off the coasts so crews could look for fresh water.

“Only one of the islands has water,” Goodhew notes, explaining that the sailors infested the Galapagos with unwanted inhabitants. “Rats, donkeys and goats are terrible pests there.

“(Man) nearly made the tortoise extinct in the 1500s and 1600s. Their carapaces can be six feet long. The sailors would flip them over on their backs and drag them down to the beach. The tortoises could live without water or food for months and the ships would have fresh meat.”

Goodhew says scientists at the Ecuadorian Darwin Research Station have been trying in vain to get a Galapagos tortoise by the name of Lonesome George to pair up with a similar species.

“They’ve been trying to get Lonesome George to mate for 30 years,” Goodhew says. “He’s the last of his species.”

Goodhew’s adventures have whetted his appetite for more nature photography excursions around the world. He already has booked a trip to Antarctica for February 2006.

Because he will be so far away from a photo shop, Goodhew plans to take along some film “just in case all the digital stuff craps out.”

He has found, however, that the silicon chips that store his photographs are quite resilient.

“I have even had them go through the washing machine.”
When YKK Corp. of America president and CEO Alex Gregory needed to make changes in the Macon, Ga., manufacturing operations of subsidiary YKK USA, the small-town bred, Georgia native went out and met with workers on their schedule to explain what was happening.

Beginning at 3 a.m. on two different days Gregory met with employees in groups of 50, spending an hour with each group fielding questions on the decisions the company had to make to remain viable in the face of overseas competition.

“The apparel market for goods made in the United States is shrinking. The figure quoted for the amount of imported merchandise is as high as 96 percent. We have 12 plants in Macon and the reason why we are still in business in Macon is because we’ve successfully diversified in other-than-apparel markets, and we’ve made the effort to remain competitive,” says Gregory, TE 70, who became president and CEO of YKK Corp. of America in January 2002.

Recently Gregory was named the first non-Japanese group officer of the Tokyo-based worldwide manufacturer of sewn products fasteners and architectural building products.

Keeping jobs in Macon is also important to Gregory on a personal level. He remembers a phone call he received in December 1975 from his father, Edward Alexander Gregory Sr., telling him they were closing the Eatonton, Ga., cotton mill his father had worked at most of his life.

“He was 55 years old and he died two days later. It killed him,” Gregory says.

In 2003, Gregory lowered wages and cut benefits for all employees, including himself, and made the tough decision to discontinue producing some yarns in Macon because it was much less expensive to buy the material than produce it.

Gregory has taken to heart the company philosophy created by YKK founder Tadao Yoshida, who said a business must foster a “cycle of goodness.”

Yoshida believed that the continual creation of innovative ideas and inventions and the resulting business expansion would bring prosperity to con-
sumers and trading partners, thus benefiting all society.

“...In all decisions we make, we think of the stakeholders,” Gregory says. “The employees, the communities, the customers, these are all stakeholders.”

With this thought, Gregory and his team created the “Competitive YKK Macon Initiative,” his plan to keep YKK’s Macon plants open and profitable.

“I went down and met with the mayor, the county commission chairman and our employees before we announced anything and they appreciated that,” Gregory says. “I also wanted our employees in Macon to understand the challenges we face now. Our customers are making sourcing decisions, whether to buy from the United States or Asia, and we need to be as competitive as possible to keep them in this hemisphere. YKK has a strong presence throughout Asia, but we want to be competitive here,” he says.

“I feel an obligation to the communities we are in and especially Macon. I was the first person hired there before the first plant was built. That is when YKK began manufacturing in the United States and the Macon plants grew to 2.5 million square feet and the largest zipper production capacity in the world. That factory in a forest is a dream our founder had and there are a lot of us who want that not only to survive, but to thrive.”
per went up, which we use in many of our zippers, we would just affix a surcharge to our customers. Now our customers would laugh at us if we tried to do that. The consumer is benefiting from all of this, but the manufacturers and suppliers are being squeezed, sometimes to death.”

As the textiles market tightens in the United States and moves increasingly offshore, YKK is strengthening itself in other areas. While its zippers hold pants up, the company’s other products are holding buildings up. The company’s aluminum products division — YKK AP America, which produces extruded aluminum architectural products and has a plant in Dublin, Ga. — accounts for two-thirds of its global revenue.

“We had the sources for dealing with metals to go into our zippers, so it was a natural progression for YKK to move into this business. Most people think these businesses would be totally separate, but they have similar origins.

“Architectural products are a huge part of YKK’s business, although to date sales in the United States are in the commercial realm — office buildings, schools and nonresidential construction. We are currently looking at the very stable, growing residential market. YKK Japan has already diversified into both commercial and residential products.”

In the past, YKK America sought to be viewed as an American company though it had Japanese ownership, however now it embraces its global roots. YKK consists of companies in 66 countries, but Gregory says he wants the 15 companies in the region to think and act as one.

“If we have a problem with a customer, sometimes the organization gets in the way and I don’t want that. YKK has a presence in 66 countries around the world,” Gregory says.

“I was just sending an e-mail to a customer in Germany who was having a problem with YKK Europe, but the way I look at it, if you are having a problem anywhere with YKK, it’s my problem.

“I am unique in my position as the only non-Japanese group officer in this company,” he says. “The question everyone always wants to ask is how did Alex Gregory, a textile engineer from Eatonton, Georgia, become CEO of YKK Corporation of America? I’m not even sure I know the answer to that.”

That journey began in Eatonton, where Gregory grew up working summers in the cotton mill with his father.

“When the time came to go to college, I applied for textile engineering at Tech and my mother tells me that is the only application I sent off. That was all I knew and that’s what I wanted to do,” Gregory says.

After graduating in 1970, Gregory served three years in the Navy before returning to Georgia with his wife for a visit in the summer of 1973. Facing his release from active duty, Gregory hoped to find a job closer to home and on a visit to his wife’s hometown of Macon, he heard of a Japanese company coming into the area that needed a textile engineer.

“I met with them and the interview did not go really well,” Gregory recalls. “They were speaking philosophically, and at that time I couldn’t relate to that.”

Yoshinori “Kenny” Kitano saw something in Gregory, however, and asked him to meet with him again at the com-
company’s headquarters in Lyndhurst, N.J., after Gregory returned to duty in Pennsylvania.

“I spent the day with Mr. Kitano and I loved him. I knew I could work for this man, so I committed to go to work with YKK,” Gregory says.

Gregory started work in September 1973 and, except for a stretch from 1984 to 1991 when Gregory went to work with The Myrick Co. as vice president of international services, has spent his career with YKK.

“I worked for a brilliant man in Macon at YKK for 11 years and being around his brilliance I didn’t know what my own capabilities were. I needed to do something else to find myself. I loved the company, but I needed to do something else to appreciate that,” he says.

When he was approached by YKK’s president in 1991 to return to the company, he was at first hesitant.

“I worked providing real estate services for Japanese companies and I had remained very close to YKK. I was having dinner with then-president Nick Tsukobawa, and he showed me a reorganization chart. I saw a blank near the top and asked him if he had anyone in mind for that position and he said, ‘Yes, you.’ I was shocked. I never thought I’d go back because people don’t often go back into Japanese companies when they voluntarily leave. I was very happy working with Mr. Myrick, but sometimes things change by way of evolution,” Gregory says. “After three months of serious thought, I decided to come home to YKK.”

In 2002, when Gregory was named president and CEO of YKK America, it sent shock waves through the company.

“I remember people couldn’t imagine a non-Japanese person running a Japanese company, and furthermore, I honestly had no aspirations of becoming president. But it happened because the owner of the company, Tadahiro Yoshida, son of founder Tadao Yoshida, made it happen. He said, ‘Alex is going to be president, make it work.’ I’m sure it was not any one thing that qualified me for the job, but a history of appreciation for the company philosophy, the corporate culture, the work ethic,” Gregory says. “There must have been some purpose for Mr. Yoshida wanting to put me, as an American, in this job, but no matter who was in the job they would have faced the same challenges and have had to make the same adjustments I had to make.”

Gregory says he learned many lessons at Tech, the most important of them perseverance.

“I was not the best student, but I persevered and I learned a lot. Tech is as much about character building as it is anything,” he says.

That lesson has served him well, he says. He retired from the U.S. Navy Reserve in 1998 as a commander after 28 years and has spent the majority of his career with one company. He also has studied tai chi and kung fu, has gained a functional knowledge of written and spoken Japanese and is now studying Spanish.

“Not quitting was the thing I learned at Georgia Tech and so many times it has served me well,” he says. “One of my kung fu instructors taught me about the value of incremental progress. He said, ‘It’s amazing what you can accomplish if you simply don’t quit.’

“When I was on the plane the first time going to Japan in 1973, I started studying Japanese. My Japanese now is nowhere near fluent, but I have learned the 2,000 basic kanji and I speak pretty good functional Japanese, enough to travel by myself and pleasantly surprise taxi drivers and sushi chefs in Japan. Now when I go to Mexico and Central America, I can’t yet do that in Spanish and I feel awkward and very much like the ‘stupid American.’ I’m going to do better than that so my two children and my precious granddaughter, Emma, will be proud of me.” GT
Getting Results
Fiscal year 2004 marked by commitment and innovation

Georgia Tech Alumni Association
Annual Report 2003-04

Accomplishing the Alumni Association’s mission involves four parts: engaging alumni, communicating, gathering and managing information, and fund raising. These drivers are supported by the Alumni Association’s steadfast focus on commitment, innovation and results.

“In order to be successful, we have to innovate constantly in terms of the services we provide,” says Joseph P. Irwin, IM 80, executive director of the Alumni Association. “It’s a philosophy that’s critical to our ongoing efforts to engage more alumni, raise money for the Institute and communicate with the Georgia Tech community in a professional manner.”

Changes in the Alumni Association bylaws set to take effect next year will reflect the current operating structure and practices and the environment expected in the future.

The following highlights of fiscal year 2003-04 exemplify the first two imperatives — commitment and innovation — as key elements of a process that accomplishes the third, results.

Commitment

The 57th annual Roll Call began July 1 with a $7.5 million goal. Georgia Tech’s chief source of unrestricted funds, Roll Call dollars help capitalize on the very best opportunities to advance the Institute.

At the annual Phoenix Dinner, 85 members of the Burdell Society ($25,000) and Phoenix Circle ($10,000) levels of Roll Call giving were honored for their generosity. The affair was hosted by Alumni Association President Tom Gay and his wife, Oggie, along with President Wayne Clough and his wife, Anne.

In February, phonothon fund-raising efforts exceeded one of the yearly goals early by securing 12,336 donors. The final number of donors passed the 13,000 mark.

Successful completion of the 57th Roll Call was celebrated with the annual Presidents’ Dinner. The black tie evening of dinner and dancing was held June 11 at the Georgia World Congress Center and attended by 600 invited guests.

The second annual Gold & White Honors event on March 18 recognized members of the Tech community for their outstanding service on behalf of alumni and the Institute. Honorees and their awards were: Brittany Robinson, Outstanding Young Alumnus; Joe E. Hill
and Roland M. Toups, Dean Griffin Community Service Award; Robert McMath Jr., Howard J. Morrison, Edward K. Reedy, Jack Thompson and June Weitnauer, Honorary Alumnus designation; and Lawton “Mac” Nease, John C. Staton Jr. and H. Hammond “Buck” Stith Jr., the Joseph M. Pettit Alumni Distinguished Service Award.

**Georgia Tech clubs** started the year by renewing their ties to the Institute through a timeless tradition: football. During the 2003 season’s first three games alone, clubs nationwide hosted more than 50 game-watching parties.

Fifty-three clubs signed on to participate in the **Club Scholarship Program** with a goal of raising $123,000 for freshmen.

Clubs demonstrated commitment to their communities on **Team Buzz Day** Oct. 18. The event, held in conjunction with student activities on campus, involved 350 alumni representing 30 clubs nationwide in a variety of community service projects.

**Leadership Georgia Tech**, held Oct. 23-24, was attended by 87 officers from more than 70 clubs throughout the United States.

The Alumni Association co-sponsored **FASET**, an orientation for freshmen and their parents. Nearly 2,200 new Tech students attended the program and received souvenir mugs and rat caps.

Student organizations were off to a good start in 2003-04 with kickoffs for the Student Foundation and Student Alumni Association attended by more than 50 and 60 participants, respectively.

September’s **Family Weekend** was packed with fun and useful information. Events included a tailgate party, tours of Technology Square and Atlanta and sessions describing Tech programs, faculty and student life. The 1,620 participants included Next Generation families — alumni and their high school-age children. For second-generation Tech freshmen, the weekend was capped by a Legacy Lunch, attended by 100 first-year students and their families.

**Homecoming**, the single largest collection of activities on the Alumni Association calendar, was held Oct. 2-4. The weekend’s centerpiece was Technology Square, the eight-acre expansion of the Tech campus in Midtown. Buzz Bash, the get-together for all other reunion classes, attracted nearly 1,000 alumni to the West Stands for an evening of food, music and fireworks. A capacity crowd attended a tailgate party on the quad-rangle.

**Technology Square’s grand opening** Oct. 23-24 was marked with a block party that included food and entertainment and tours of the multibuilding complex. The Alumni Association, which played an important supporting role in development of the project both as an organization and through key alumni, provided assistance for marketing and coordinating the opening events.

Thirteen was a lucky number for the George C.

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**Message From the President**

The length of a shadow cast by a university is proportionate to the stature of its alumni. We alumni of Georgia Tech are the proof of the pudding, so to speak, and really it is you — through your achievements, involvement and support — who give our great institution its stature. It has been an honor to serve as president of the Georgia Tech Alumni Association for fiscal year 2003-04.

The exceptional success of the Roll Call, which surpassed its $7.5 million goal, speaks to your generosity and commitment. Nearly 28,000 of you contributed to this annual drive that is Georgia Tech’s largest source of unrestricted funds. That makes a real difference. Because every dollar the state gives is earmarked, President Wayne Clough can use the unrestricted funds to meet Georgia Tech’s greatest needs.

Homecoming is always a spectacular event, but this year it received national recognition. The Council for the Advancement and Support of Education gave our popular Homecoming celebration, Buzz Bash, a gold medal.

It was a proud occasion when alumnus Michael Arad’s design was chosen over 5,200 others for the World Trade Center memorial. And Joe Byrd, a 1938 grad, funded a Georgia Tech memorial at the plaza entrance of the Wardlaw Center honoring four of Tech’s military heroes who received the Medal of Honor.

We have 75 Georgia Tech clubs nationally whose members stay connected to Tech. Club officers led in supporting Roll Call. The clubs support academics and athletics at Tech and raise scholarship funds to sponsor local students bound for the Institute.

We made major changes to the bylaws of our Alumni Association. It had been almost 20 years, and we have changed from the volunteer-driven organization of 1985 to the mission-driven Association of today.

The Alumni Association also went through the process of refining its brand and clarifying its message. The new brand features an image of the Ramblin’ Wreck but stresses the real brand — “Georgia Tech Alumni.” You are what we are about.

L. Thomas Gay, IM 66
President
Griffin Pi Mile Road Race.
That was the most-ever number of sponsors donating cash or products for the 5K race, which was held in March and drew 386 runners.

The 21st annual Georgia Tech Alumni Career Conference in April drew 1,000 alumni to the Cobb Galleria for the opportunity to meet with employers from 62 companies.

The second annual “Up with the White and Gold: An Evening to Honor Georgia Tech’s Finest” was hosted by Student Ambassadors in April. Awards were presented to faculty, staff and students in appreciation for their contributions to Georgia Tech.

Student recruiting is one way that alumni aid Georgia Tech. Alumni volunteers across the country attended about 140 college fairs and spoke with an estimated 12,000 potential Tech students.

This spring Alumni Relations worked with the Georgia Tech Admissions Office to send representatives to 10 out-of-state accepted-student receptions to help recruit potential Tech freshmen who were making their final college decisions.

Georgia Tech Ambassadors hosted 27 campus tours for legacy students interested in attending Tech. The Ambassadors participated in 100 events during the fall, including Game Day Friday campus tours of the new Campus Recreation Center, Technology Square and Chandler Stadium.

The Student Alumni Association hosted its annual exchange program with the Georgia Power Georgia Tech Club. Alumni and students participated in the monthlong program, which allows students to get a firsthand look at the working world.

The Georgia Tech Alumni Executive Network, formed in 2002 to provide networking and educational opportunities for alumni with a minimum of 15 years of experience, continued to attract large audiences at its monthly meetings. The program also includes three geographic-based small groups designed to assist alumni with senior-level employment searches.

More than 500 alumni sought the services of the Career Development office this past year. Services include career counseling and assistance with resume writing, networking, interviewing skills and industry research.

Data entry operations processed an average of 235 biographical and address updates a day and delivered 700 constituent lists to users across campus and clubs, a 75 percent increase over last year.

Electronic communications have become an integral part of informing and communicating with alumni and supporters of the Institute. During the year more than 600 electronic mailings regarding events, special benefits and news were distributed using the more than 45,000 e-mail addresses the Association has acquired. ParentNews e-mail updates now reach 7,700 parents. The listserv has grown 600 percent since 2001.

Information and ongoing contact with Georgia Tech also were provided to alumni through publications created by the Communications department. Tech Topics was published four times during the year and mailed to all alumni, plus friends, faculty and staff. The Georgia Tech Alumni Magazine, also published quarterly, went to Roll Call contributors. The electronic newsletter BUZZWORDS was prepared monthly and available online as well as by free subscription to alumni and other Tech supporters.

The Living History department recorded more than 50 oral history interviews with Tech alumni, conducted presentations on Tech
history and produced videos, including a special documentary for the Class of 1953 reunion.

Space rental in the Alumni/Faculty House received a significant boost with production of a brochure accompanied by a marketing push. Proceeds from rental of the space for meetings, receptions and other events are earmarked for maintenance of the 90-year-old structure. By the end of October, revenue from Alumni/Faculty House event space rental surpassed the total from all of last year. End-of-year numbers topped 150 percent of the projected goal.

**Innovation**

Following months of study and alumni feedback, the Alumni Association adopted a new brand presentation. The logo features “Georgia Tech Alumni” as the centerpiece, the Ramblin’ Wreck and the tag line “Honoring Yesterday — Building Tomorrow.” The six-month phase-in of the new branding will provide the Association with a unified, consistent look.

Alumni Association senior staff has taken the first steps in an effort to significantly enhance alumni data collection and population of information within the database. Dubbed “Data Monster,” the project’s collaborators include the Georgia Tech Foundation, Athletic Association and Georgia Tech’s Development and Communications offices. The Association is fully engaged in the continuous acquisition and management of its database and enhancement of the critically important resource is a mandate. A business plan has been developed to outline additional resources for the process and to map performance measures and objectives.

Throughout the year, the Alumni Association’s Web site has been upgraded and improved, reflecting a growing preference among alumni for electronic communication.

Alumni Relations and Database Management created “Georgia Tech on the Move,” a membership solicitation tool notifying club officers when an alumnus has moved to their area.

A three-tier corporate-support business development program has been instituted for the Association. Each of the three levels — advertising, endorsed products and affinity partners — carries specific conditions and benefits. The new program is expected to enhance the sponsorship and advertising revenue streams for the Alumni Association to offset costs of alumni programming and to allow a more disciplined management of the business partnerships.

During the year the Alumni Association signed partnership agreements to provide alumni with new benefits. A contract with Kaplan Education Centers will bring $12,500 a year to the Alumni Association and a $100 royalty for each alumnus who enrolls in any Kaplan class. An agreement with O’Brien Investment Group allows the firm to market and conduct retirement seminars to alumni. A three-year pact with Washington Mutual will provide alumni with certain discounts and benefits when purchasing or refinancing a home. The Alumni Association will receive an annual affinity fee of $12,500 along with $9,350 in advertising revenue each year.

**Feedback** is an important tool in the Alumni Association’s commitment to high-quality, innovative products and services. Club members and participants in selected tours were among the alumni surveyed this past year.

**Focus groups** were conducted with young alumni to identify their interests and ways in which the Alumni Association may better serve them. Other young alumni focus groups examined the perspectives of Roll Call donors and non-donors.

A Young Alumni Advisory Committee Conference was organized to explore new ways of engaging that particular constituency. In addition, a committee comprised of representatives from each Alumni Association department was created to advise the young alumni group and help increase involvement.

**A Young Alumni**
Roll Call set two records with a final tally of $7,510,289 from 27,973 donors. Roll Call is Georgia Tech’s largest source of unrestricted funds.

Career Networking Night was held in February and included a panel discussion by alumni entrepreneurs. The first Young Alumni Networking Roundtables were held in July and in October, with more than 85 alumni in attendance at each program.

“Georgia Tech: Innovating Here and Now” was the title of the first regional alumni event, held at the Georgia Tech Hotel and Conference Center in February. The evening event was attended by 632 alumni and featured a panel of faculty members discussing their cutting-edge research.

The Alumni Association and College of Management joined forces to host networking events in July and December. More than 100 alumni participated in each event.

The Women’s Advisory Committee launched a quarterly speaker series with a networking breakfast for alumnae, as well as hosted its first social activity.

The Greek Alumni Council was formed to provide alumni guidance for the campus Greek system. At organizational meetings, 20 fraternities and sororities were represented.

The Industry Expert Series, designed to provide alumni with a new forum for networking and business education in a particular industry or profession, was launched this year. The first program, held in October at Technology Square, was designed for alumni in construction or real estate. A program in March targeted alumni who are lawyers. The year wrapped up with a program for alumni in the financial services industry.

The Student Alumni Roundtable discussion. The event drew 50 participants.

A Board of Trustees Mentoring Program was formed this spring with 50 alumni and 50 students participating in the inaugural event.

Real world advice on careers and networking were the topics at the first Student and Alumni Roundtable discussion. The event drew 50 participants.

The Senior Success Series concluded in March. Participants in the eight-part series numbered 348. Student Appreciation Day, conducted with assistance from the Alumni Association, brought 5,000 students together for a festival and concert in April.

A “Gettin’ Out” party was held April 23, the last day of classes for graduating seniors. Organized to welcome seniors into the Alumni Association, the free event featured barbecue, beverages and music and attracted 300 students.
Results

Roll Call’s final tally was $7,510,289 from 27,973 donors, both records. The number of Leadership Circle donors increased by 6.7 percent while matching gift contributions grew by 9.3 percent over last year. Young alumni giving was especially strong: The classes of 1990-2002 increased their Roll Call donor numbers by 12.5 percent and the classes of 1998-2002 increased by 20 percent. The number of parent donors also grew, by more than 47 percent, as did the dollar amount from that group, by more than 15 percent.

Overall Homecoming attendance at Alumni Association-sponsored events increased over last year, with participation by more than 47 percent, as did the dollar amount from that group, by more than 15 percent.

Buzz Bash 2003 received accolades from national professional organizations. The Council for the Advancement and Support of Education awarded the event a gold medal for alumni programs. The International Special Events Society recognized Buzz Bash with a nomination for “best special event of the year.” The annual alumni Homecoming activity was one of three nominees selected from 15 submissions. In January and February alone, nearly 7,000 alumni participated in Alumni Association programs, events and club activities. The Alumni Association Web site averaged more than 80,000 user sessions each month.

The Georgia Tech Student Foundation allocated $13,000 to seven student organizations on campus. The Parents Fund provided $25,000 to install additional emergency call boxes on campus. The “Ten for Tech” fund-raising campaign has generated 1,000 new donors from direct-mail solicitations and 800 new donors from phonathons. The Club Scholarship Program completed the year with $150,000 awarded to 107 students, with an average award of $1,400.

Parent volunteers raised $20,000 in fall phonathons. Publications ad sales finished the year with a total of $198,417.

Alumni Communications earned three honors in district CASE competition. The Georgia Tech Alumni Magazine feature “Architecture of Atlanta” received an award of excellence. The magazine and Tech Topics each received special merit awards.

Merchandise sales generated $87,685 in revenues for fiscal 2004. A new product, a Georgia Tech Fossil watch, sold 70 units during its first week, netting royalties of $787.

The Alumni Association’s partnership with Liberty Mutual insurance finished the year $7,000 above its $10,000 goal.

The Career Conference generated more than $81,000 in revenue and, for the first time, sponsors for the breakfast and workshops generated an additional $3,500.

The Georgia Tech Alumni Travel program, which offered 25 tours to more than 25 countries, surpassed both its tour revenue and travel-insurance revenue goals. The number of alumni and friends traveling in fiscal 2004 surpassed that of fiscal ’03.

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### Table: Statement of Ownership: October 2004

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Joseph P. Irwin
Publisher
Making Ideas Happen
ECE professor looks at big picture to integrate technologies

By Maria M. Lameiras

Whether the project is creating an unmanned helicopter to keep pilots safer in a war zone or making sure the hamburger bun coming out of the industrial oven is perfectly browned, Georgia Tech professor George Vachtsevanos is taking ideas and making them happen.

“I look at myself as the integrator, the person who brings together the technologies and the people who practice them and I have followed that through my career,” says Vachtsevanos, who joined Tech’s School of Electrical and Computer Engineering in 1984 as a professor. Since then he has established the school’s Intelligent Control Systems Laboratory.

“My driving force is to always look at the big picture — how to integrate different technologies,” he says. “The interdisciplinary concept for us is not that we are jacks of all trades, but the underlying approach which suggests looking at complex systems and processes to see where you can control them. We develop the intelligent tools to do those things, building on top of what we have already into new technologies.”

In April Vachtsevanos received the Class of 1934 Outstanding Interdisciplinary Activity Award from Georgia Tech.

“Georgia Tech offers a unique environment that promotes working with other disciplines,” Vachtsevanos says. “That has been my biggest thrill here. I know I can pick up the phone and call another professor and say, ‘Let’s pull a team together to get this done,’ and it will happen. If it were at another institution I do not believe we could have done 1 percent of what we have done as a team here.”

Vachtsevanos has collaborated with neurologists seeking technology that will help patients who suffer seizures, cardiologists working with patients who have heart arrhythmias, military engineers working to improve the reliability of jet aircraft, meat processors who want to ensure that their boneless chicken is completely bone-free and commercial bakers seeking perfect consistency for the fast food industry.

“You may ask, ‘Where is the link? How do all of these things gel together?’ The underlying theme of them all is intelligent control systems,” Vachtsevanos says. “The theme I have pursued for many years is to look at..."
combining classical techniques in systems control with new areas of research like artificial intelligence. These are things I felt could be married. You take elements from the classic domain and the modern domain and take advantage of the benefits of both.”

In August, Vachtsevanos traveled to Fort Benning in Columbus, Ga., for the final demonstration of a fully autonomous, unmanned helicopter developed in cooperation with aerospace engineering researchers.

“When a helicopter is supposed to fly as an unmanned vehicle, with no pilot, that vehicle must behave the way a manned vehicle behaves. You must capture the pilot’s experience and expertise in the control system. If a pilot encounters an emergency, such as a big wind gust, that pilot knows how to maneuver so he will not crash,” Vachtsevanos says.

“If you have an unmanned vehicle, the instruments, sensors, computers, communications and controls have to mirror that kind of a response and that is when the intelligent component comes into play. We have to consider how we see and perceive things. That is why we put sensors on the outside of the vehicle, so it can see buildings and other obstacles as it approaches them.

“Major advances in software have given us the ability to design and implement very sophisticated software algorithms that capture the essence of the pilot’s brain. We were then able to design and build custom processors we put on board that have the ability to pick up and analyze the information from the instrumentation in order for it to execute as if it had a pilot on board,” he says.

Although the thrust for the current research is in military applications, Vachtsevanos says there is unlimited potential for the technology. “This could be utilized in other application domains such as homeland security, patrolling borders, rescue operations, sending the vehicle into an area with hazardous conditions — we see this as a dual-use technology for civilian use as well as military use,” he says. “This is an excellent example of an underlying technology that has been adapted using intelligent control systems. You are relying on both classical and new technologies combined in the best way possible to solve very complex problems.”

For 12 years, Vachtsevanos and his group have participated in research of a very different and chaotic kind of system — the human brain.

“We have been working with neurologists and researchers focusing on how to detect and control epileptic seizures. Our method is to look at the brain as a system we can interpret and it will tell us what we need to know,” he says. “The neurosurgeon implants electrodes in the patient’s brain and we monitor the brain’s activity before, during and after a seizure. When that seizure comes on, we can develop a systems approach on how to detect or predict a coming seizure and stop it before it starts.”

Vachtsevanos and his colleagues hold several patents for technology to detect seizures and the technology has been licensed to NeuroPace, a West Coast company that has built an implantable device and is conducting clinical trials on its effectiveness.

“The preliminary indicators show that indeed they can stop a seizure using some of the technologies developed at Georgia Tech from our software applications,” Vachtsevanos says. “In our case, the same electrodes used to monitor the brain activity pick up indicators and process those raw signals, extracting the useful information that the person will have a seizure, then the device injects an electrical signal into the brain and stops the seizure from happening.

The same technology could be adapted for use in addressing other neurological disorders such as Parkinson’s and Alzheimer’s diseases, he says.

“Some of the generic aspects of the technology can flow into other areas. We are now working with cardiologists to look at and analyze cardiac signals of people at risk for cardiac disease. Cardiac arrhythmia is a major cause of death for people who have suffered a heart attack and we want to see if there are signals that suggest which group of people are more at risk for cardiac arrhythmia,” Vachtsevanos says. “The common denominator is that intelligent systems techniques can be used.”

The same sensors that pick up the electrical activity in the brain and heart are used for vibration sensing on the unmanned helicopter or other military and industrial critical systems to detect flaws in the machinery.

“The underlying method is to take a raw signal and analyze it to see what and where the information is. You start with raw data and use the technology to produce information and from that information you migrate into knowledge,” Vachtsevanos says. “Most of the effort goes into digging the important data from the raw data. We have to make sure we are looking at the right things and then determine what those indicators are telling us.

“If it is the brain, we have to be sure the signal is telling us a person may suffer a seizure. If it is on a helicopter and you see an indicator on the control panel, I want to know if the problem is in the engine or a crack in the rotor. If it is in food processing, I want to know there is a problem before the buns are too burned and I want it to tell me there is a bone in the chicken before it ends up at McDonald’s.”

Vachtsevanos says his work would not be possible without the technological advances of the past few years.

“For decades the focus has been on the process, but not on the product — computing, imaging, sensors. Our emphasis is to control not only on the basis of the process, but on the basis of the product,” he says. “If you can get data that is telling you why something is happening, you can fix it before it happens. Intelligent control systems people are trying to close the loop. We have been introducing things that will do things a little smarter than we have done them before.”

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Mati Chessin, a first-year graduate student in mechanical engineering, gives his impression of the famous photo of Albert Einstein sticking out his tongue. Chessin won first place in an Einstein look-alike contest held during grand opening festivities for the new Student Center Commons. The photo of Einstein was taken March 14, 1951, at the astrophysicist’s 72nd birthday party when a UPI photographer was trying to coax him into smiling one more time. Instead Einstein rewarded the photographer with this now-famous expression.