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Mapping the Mysteries of Life
Genomic computing could guide scientists toward the Fountain of Youth. "We are on the precipice of an exciting era in which the rate of discovery and the rate of application of that discovery will be faster than any time in the history of mankind. I don't know if that will be for good or for ill, but it certainly will be exciting," says Tech's Gary Schuster.
By Kimberly Link-Wills

Making A Contribution
Ron Peterson has never let his crippling disability deter him from his goal.
By Neil B. McGahee

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Extraordinary Accomplishments
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The priceless scrapbook of alumnus Charles Seward — the grandson of Lincoln's secretary of state, William Seward, was found in a Chattanooga trash container. Filled with historic memorabilia, its ownership is now in dispute.
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Cover: An American flag taped to the campanile is a solemn symbol during Georgia Tech's memorial service to honor the thousands who lost their lives in the terrorist attacks in New York, Washington, D.C., and Pennsylvania. See story on page 8. — Caroline Joe Photo

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Max Hammond Killed In Terrorist Hijacking

A dear high school and college friend of mine was killed aboard United flight 175. His name was Carl Max Hammond Jr., and he graduated from Georgia Tech in 1987 with a degree in physics.

He had started working for a research firm near Boston about a year ago and was on his way from Boston to a conference in Los Angeles when terrorists hijacked the plane and slammed it into the World Trade Center.

I don't know much about Max's activities after he left UCLA (where he earned a doctorate in physics), but I wanted him to be remembered in any information issued about Tech alumni involved in this tragedy.

Nancy Holt McGinnis, IE 86
Lilburn, Ga.

Hammond was the first Tech alumnus confirmed to be among those killed in New York, Washington, D.C., and Pennsylvania on Sept. 11. President Wayne Clough honored Hammond during his remarks at a campus memorial service on Sept. 14 (page 8).

Disappearance Article Interesting, Amazing

Thank you for the article about Joe Morse in the GEORGIA TECH ALUMNI MAGAZINE (Summer 2001). It was interesting, to say the least. It is amazing how a person can disappear from the face of the earth without a trace. We who read the article want to help in any way we may. Putting his picture on the cover will let thousands of people see it, and remember his picture when looking at strangers. If anyone knows of any other way we may help, they only have to let us know.

The magazine is excellent. Keep up the good work.
William Crane Sr., Cls 50
Winston-Salem, N.C.

Anyone with information that could be helpful in finding Joe Morse is asked to contact the Georgia Tech Police Department at (404) 894-9966 or FBI Special Agent Neil Rabinovitz at (404) 679-6237.

No Excuse for Delay

I was both saddened and surprised when I read "The Disappearance of Joe Morse." I was saddened because my heart goes out to Joe's family for the pain, desperation and helplessness they must feel. It is a story that likely has no happy ending — if it has an ending at all.

I was surprised because I had never heard of Joe Morse. I find it very disturbing that he has been missing for well over a year, but the ALUMNI MAGAZINE waited until now to run the story. I thought about the stories that have appeared in this magazine during the past year but could think of none that should have been given priority over that of a missing Georgia Tech student. Tech's alumni base — especially those who reside in Atlanta — should have been informed within two months of Joe's disappearance. Doing so would have increased the probability of finding him.

Continued on page 6

North Avenue Momentum

The shock, dismay, and sadness we all feel after the terrorist attacks on our country transcend our daily routines. It's a reminder of how precious life is and how fleeting it can be.

We've lost a lot. Let's show our strength by helping each other. Georgia Tech students, faculty, staff and friends expressed their grief at a huge remembrance ceremony at the campanile (page 8).

For the first time, Tech is hosting 15,000 students. It's an example of the kind of momentum we feel these days and something that is both pleasing and challenging. It's pleasing because it really tells the story that your degree from Tech is more valuable in the marketplace than ever. It's challenging because even with our spending on infrastructure — housing, parking, classrooms, labs and more — there's still a great deal of work to be done.

President Wayne Clough's strategic planning meetings make it clear the future is very bright for your alma mater. "Defining the Technological Research University of the 21st Century" is the vision. And what a vision it is: a student-focused education, a diverse community, an enhanced research enterprise, outreach through economic development and facilities expansion and improvement.

For a glimpse at the Alumni Association's year, check out our annual report (page 29).

Football season is here too — Homecoming is near and I encourage you and your family to join us. We have some new and exciting things that are worth checking out. Want to know more about entrepreneurialism, jazz or Handel's "Messiah," or global security in the 21st century? We have a presentation for you.

And, of course, Buzz Bash is back and will be bigger and better than ever. So come on back to North Avenue. Check the Web site at www.gtalumni.org for all the details and to register.

Joseph P. Irwin
Executive Director
Georgia Tech Alumni Association
the chance that Joe, or information about his disappearance, could have been uncovered. I'm sure that other readers, in addition to myself, are very interested in knowing why this inexcusable delay occurred.

Christopher S. Davis, IE 93
Atlanta

We too are saddened by the disappearance of Joe Morse. As the article relates, it is an incident that has troubled Georgia Tech administrators and law enforcement officers from the start. As a quarterly publication, we seldom publish articles that would be called "hard news."

What made Joe Morse's story compelling was the one-year anniversary since he disappeared and the circumstances surrounding his disappearance. The story was further made poignant by the heartrending details Joe's parents shared. The length of time that Joe had been missing was one of the crucial elements that made the story important to tell. It is our fervent hope that Joe will return and be reunited with his parents.

Hubbell Rare Breed

Some people are born to lead. Admiral Lester Hubbell was that kind of person. After receiving my commission from Officer Candidate School in Newport, R.I., in 1962, I reported to the USS Yosemite in Newport. Les Hubbell was the captain and commanding officer.

The best story I remember about him was when the Yosemite went to San Juan the previous year. Capt. Hubbell stood on the beach and challenged the enlisted crew to throw him into the water. He was a former football player for Georgia Tech and had a black belt in karate. Regardless, I thought that it was a reflection of a man who had the panache to allow his men to treat him as one of their own and yet maintain his authority. His smile made my day.

I spent nine years on active duty in the Navy. I'm a Yankee like the admiral.

There are those few people we meet who make us feel better about ourselves. Admiral Hubbell was one of that rare breed.

Edward C. Auble
West Chester, Pa.

Lester E. Hubbell, IM 38, was a retired Navy rear admiral. A native of Teaneck, N.J., he was a member of Sigma Phi Epsilon fraternity at Tech. He died of cancer on June 16, 1995.
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A Day of Ren
Three days after suicide terrorists killed thousands in attacks against America on Sept. 11, Georgia Tech students, faculty and alumni jammed the Campanile Plaza to remember the innocent victims.

Among those victims was Carl Max Hammond Jr., Phys 87, of Nashua, N.H., who perished aboard United Airlines flight 175, which terrorist hijackers crashed into the World Trade Center. He is the first alumnus whose life was known to be taken.

C. Michael Gann, IM 85, of Roswell, was Atlanta's first reported casualty. He was at a conference on the 106th floor of the first tower struck. He called his wife, Robin, twice— to tell her what had happened and then to say goodbye; smoke was everywhere and he didn't think he would make it.

"We will never forget what we saw and what we experienced while we watched," President
Wayne Clough told the crowd. "We have come together today in sorrow and in remembrance of the lives of those who were killed in acts of terrorism in New York, Washington and Pennsylvania. 

"In a larger sense, all of us were diminished by those horrible, violent acts, and we are here today to stand shoulder to shoulder with each other and to reaffirm the bonds that hold us together as a community — a Georgia Tech community and a human community," Clough said.

"We were stunned by the horrific handiwork of those who live in the darkness. Today we respond by affirming our goal to create a community that lives in the light."

The campus remembrance service was organized by Chris Kavanaugh, undergraduate student president.

More on the indelible mark this national tragedy has made on Georgia Tech alumni, faculty, staff, students and their families — and the names of any other alumni who died in the disaster — will appear in the Winter Tech Topics. GT
Technology-Driven Renaissance
Campus crosses the freeway

Midtown Atlanta's technology-driven renaissance was revved up Sept. 6 with a groundbreaking ceremony for Technology Square, Georgia Tech's $180 million, eight-acre complex that will be home for the DuPree College of Management, the Global Learning Center and a new center for executive education. Technology Square will also include a 250-room hotel and conference center, a bookstore and retail and restaurant space. Construction of the complex, which connects with Tech's main campus via the Fifth Street bridge, is scheduled for completion in July 2003. The bridge will be widened to add broader sidewalks and create an enhanced, pedestrian-friendly gateway to the campus. "Midtown is undergoing a renaissance," President Wayne Clough said at the ceremony. "Georgia Tech is a participant in this renaissance, not only because we are a major institution in the community, but because — as a research university — we're a magnet for innovators and entrepreneurs and a driver of high-tech development." GT

Breaking ground are (below, left to right) Hilton Howell, chair, University System of Georgia; Georgia Lt. Gov. Mark Taylor; Atlanta Mayor Bill Campbell; Georgia Tech President Wayne Clough; Susan Mendheim, president and chief executive, Midtown Alliance; and Buck Stith, Georgia Tech Foundation.

Caroline Joe
A High Five for Athletics

Yellow Jacket sports teams enjoy one of their most successful years ever

Last year was very successful for Georgia Tech varsity sports teams, with 12 of 16 teams playing in postseason and seven nationally ranked in end-of-the-season polls.

The baseball team finished with a 41-20 record and played in the NCAA regional tournament. Nine players were selected in the Major League baseball draft including third baseman Mark Teixeira, who was drafted fifth overall by the Texas Rangers.

The men's basketball team, led by first-year coach Paul Hewitt, posted a 17-13 record and returned to the NCAA tournament for the first time since 1996. Hewitt was named Atlantic Coast Conference Coach of the Year and center Alvin Jones was selected to the All-ACC first team.

The men's tennis team ended its season with a 17-7 overall record and was invited to the ACC tournament for the fourth time in five years.

The women's tennis team received a second consecutive bid to the NCAA tournament and finished the season ranked No. 26. Long jumper Clayton Porter, freshman hurdler Montrell Pearson and sophomore high jumper Keith Schuler finished third in their events at the ACC indoor and outdoor track championships. The women's team finished third overall at the ACC indoor championships and fifth at the outdoor venue. Sprinter Alysha McClinton and long jumper Mishanta Reyes won individual ACC championships.

The Tech volleyball team finished the regular season with a 25-8 record and earned a bid to the NCAA tournament for the first time since 1996. Kyleen Bell was named first team Verizon Academic All-American.

Athletics director Dave Braine is proud of the progress made in all Tech sports but made it clear that he expects more. “The overall goal for all 17 sports is to have them ranked in the top 25 in the country,” he says. “Last year softball, women's basketball and men's track didn't make it but all the rest did. We will field a women's swim team this year, so it will be tough for them to achieve the goal this early in the program, but I think we're well on our way to achieving it in all other sports.” GT
10th anniversary is something to sing about. Who better to do the singing than José Carreras? The acclaimed Spanish tenor headlines the anniversary season of the Robert Ferst Center for the Arts with a Jan. 25 performance.

Andrea Hoffer, acting director of the Ferst Center, says the occasion calls for a big star. "Jose Carreras was like pie in the sky. But he said he'd do it. He's only doing three engagements in the United States during the year."

Hoffer also is excited about kicking off the anniversary season with the Dance Theatre of Harlem on Oct. 12. "It was a difficult date to get. They had to rearrange their routing to do it."

The anniversary season includes performances by jazz musician Diane Schuur on Oct. 27; Sandra Bernhard on Nov. 3; classical musicians Katia and Marielle Labeque on Dec. 5; Penn & Teller on Jan. 11 and 12; The Parsons Dance Company on Feb. 23; "Rigoletto" by Teatro Lirico D'Europa on March 1; and Rockapella on March 23.

The Callaway Foundation helped turn the vision for a Georgia Tech Theatre of the Arts into reality when it donated $3.75 million of the $7.5 million needed to construct the center. Ground was broken in December 1989. The theater officially opened on April 13, 1992, with a performance by pianist Andre Watts.

The center was later renamed for Robert Ferst, ME 38, treasurer of the Georgia Tech Foundation for nearly 30 years. He established the Robert H. Ferst Scholarship Fund in 1987 and was awarded the Joseph M. Pettit Alumni Distinguished Service Award. After Ferst died in 1991, his widow, Jean, made a $500,000 donation to the theater. GT

Ticket information may be obtained by calling the Ferst Center box office at (404)894-9600 or by visiting www.ferstcenter.gatech.edu.

Georgia Tech’s enrollment on campus has jumped to 15,000 — and its enrollment at satellite campuses totals nearly 500 more students. There were 15,073 students attending Tech’s main campus as of mid-September — 10,710 undergraduates and 4,363 graduate students, says Barbara Hall, associate vice president for enrollment services. Another 498 students enrolled in such off-campus programs as Georgia Tech Lorraine in Metz, France, Georgia Tech Regional Engineering Program in Savannah, distance learning, study abroad and foreign exchange, Hall says. Tech’s comprehensive enrollment reached 15,571. Of this total, 11,043 are undergraduates and the remaining 4,528 are graduate students. GT
**Langmuir Award**

Tech Professor Mostafa El-Sayed wins high honor in chemistry

Georgia Tech chemistry professor Mostafa El-Sayed has won the 2002 Irving Langmuir Award in Chemical Physics. The $10,000 prize was established in 1964 by the General Electric Foundation as a memorial to and in recognition of the accomplishments of Irving Langmuir, a chemist at the General Electric Research Laboratory in Schenectady, N.Y. Langmuir produced more than 200 scientific publications, 63 patents and won the 1932 Nobel Prize for chemistry.

The Langmuir prize is given in even-numbered years by the American Chemical Society and in odd-numbered years by the American Physical Society to a person who has made an outstanding contribution to chemical physics or physical chemistry within the 10 years preceding the year the award is made. It is considered the highest honor attainable within each society.

El-Sayed was recognized for his work using short-burst lasers to study the transportation of electrons within different materials, including semiconductor and metallic nanoparticles and photosynthetic systems.

"I feel so honored to receive this award," El-Sayed says. "I am especially pleased because it is given for a body of work rather than one specific thing."

"I came to Georgia Tech specifically because they allowed me to create the laser dynamics lab. Seven of the 10 years I have spent conducting this research have been here at Tech."

The award will be conferred at the national meeting of the American Chemical Society in Orlando, Fla., next spring.

**Chameides Named Acting Chair**

William Chameides, Regent’s professor and the Smithgall chair in atmospheric sciences, is serving as acting chair of the School of Earth and Atmospheric Sciences. Chameides was appointed acting chair following the death of Glen Cass from cancer on July 30.

A member of the Tech faculty since 1980, Chameides served as director of the School of Earth and Atmospheric Sciences from 1989 to 1994. He was promoted to Regent’s professor in 1995 and named to the Smithgall chair in 1998.

**Popular Invention**

Aleksander Szlam, EE 74, MS EE 80, founder and CEO of eShare Communications Inc. in Norcross, Ga., will be featured in a documentary about little-known inventors and their popular inventions to be aired in October on The Learning Channel.

The one-hour show will feature the inventors and their inventions, which are widely used in daily life, but often not thought about.

Szlam is inventor of the predictive dialer, an automated dialing system, and is holder of 46 patents and has 150 pending for his inventions. Other inventions to be featured on the show include the hot-air hand dryer, the leaf blower, Muzak, voice mail and the parking meter.
Worldwide Attraction

Georgia Tech’s global prestige draws international students

Georgia Tech’s focus on becoming a global leader in technology education and research is attracting top students from throughout the world.

International students make up approximately 40 percent of graduate students and 50 percent of doctoral students at Georgia Tech, according to Tech’s Office of International Education.

The overall enrollment of international students totals 2,482, an increase of 361 over last year, the largest international enrollment in Georgia Tech’s history, says Harvey Charles, director of OIE. About 85 percent of that number are graduate and doctoral students, while 15 percent are undergraduates.

"Over the last four years there has been a precipitous increase in the number of international students coming to Tech compared to the past 20 years," Charles says. "I think this is a reflection of Georgia Tech’s significant investment in making the Institute a world-class institution in terms of research and teaching."

Charles says the level of research and the quality of the faculty contributes to the "inordinate" number of international students who choose Tech for their graduate and postgraduate studies.

"The large number of international graduate students at Georgia Tech is a reflection of the growing international reputation of the Institute," Charles says. "National statistics on recipients of doctoral degrees show that a much larger percentage is awarded to international students in the physical and natural sciences relative to other fields.

"The fact that Tech is a technological institution and has a large number of graduate international students is therefore, in part, a reflection of this national phenomenon."

The top 10 countries sending students to Tech are India, 494; China, 389; Korea, 339; France, 183; Turkey, 93; Thailand, 72; Taiwan, 65; Pakistan, 46; Germany, 45; and Indonesia, 34.

DuPree’s Diva

Georgia Tech’s DuPree College of Management Dean Terry Blum is a diva. Blum was named as one of "15 extraordinary professionals who are impacting Atlanta through their work, their spirit, their generosity and their leadership" by Business to Business magazine in its "Divas 2001" listing published in July.

Joining Blum in donning the diva crown were Georgia’s first lady, Marie Barnes, state Rep. Karla Drenner, retired CNN executive vice president Gail Evans, radio station WNNX program director Leslie Fram, Mirant CEO and president Marce Fuller, BellSouth’s Margaret Greene, WSB-TV anchor Monica Kaufman, Kaiser Permanente president Carolyn Kenny, Coca-Cola’s Ingrid Saunders Jones, state Supreme Court Justice Leah Ward Sears, philanthropist Linda Selig, UPS senior vice president of human resources Lea Soupata and interior designer Jill Vantosh. Rounding out the list was Tech neighbor and Varsity president Nancy Simms.
British Open Champ

Puggy Blackmon’s vision for David Duval duly fulfilled

By Furman Bisher

N o one person, beyond his father, has had a stronger influence on the life and progress of David Duval, the golfer, than Puggy Blackmon. Coach. Mentor. Counselor. Teacher. All the above, and then some.

When Blackmon was a club pro in Jacksonville, Fla., Duval, CSL 93, was a developing junior, playing around the club where his father, Bob, was the pro near Ponte Vedra. “I saw him as a kid and you could tell he was something special,” Puggy says. “He could really play.”

So it was that when Blackmon came to coach the golf team at Georgia Tech, he kept the kid in mind. “I was one of the few who knew anything about him,” he says. Soon, Duval became a Yellow Jacket and the story of coach and student moved into another chapter. One thing led to another and, in July, to the pinnacle — British Open champion.

“This is the year,’ I’d told him,” Puggy says. “But this was beyond my expectations. I thought the PGA Championship, played, you know, in a familiar atmosphere, would be his first major.”

After Royal Lytham, Duval flew to Canada to play in that ill-advised skins game, then to California for the “Folly at Bighorn,” by which time he was exhausted with The International coming up in Colorado. Enter Puggy Blackmon again.

“I flew out and met with him,” he says. “I felt really good about him. I never saw him hitting it any better. I’m really impressed with him right now. Winning the British Open could be the missing piece of the puzzle.”

Blackmon came to Georgia Tech as its first full-time golf coach. Golf had been treated like a stepchild previously, the “coach” more a caretaker who drove the van and signed the motel bill. The program was treated with such indifference that Larry Mize, who would later win a Masters, left after three years. It was Charlie Brown, a vigorous and highly successful alumnus, who was responsible for Puggy, and you can call Brown the godfather of golf at Georgia Tech and you wouldn’t be wrong.

Soon champions and championships began to develop. The Yellow Jackets won ACC championships. Matt Kuchar won the U.S. Amateur championship. Today, four former Blackmon protégés play the PGA Tour, Duval, Stewart Cink, Michael Clark and Tripp Isenhour. And you might add a fifth, Briny Baird, who was around until he developed an aversion for academics.

Puggy (William, if you insist) Blackmon has since moved on to South Carolina, but he hasn’t lost touch with his old Tech grads. In fact, he was located recently caddying for Michael Clark in the oppressive heat of the Buick Open.

Clark won a tour tournament last year, but isn’t having the best of it this time around. The coach didn’t make it to the British Open, but was with Duval in spirit and by overseas telephone.

He was aware that Her Majesty’s subjects found Duval somewhat of a personality puzzle. Such words as “dour” and “robotic” were used to describe him in his dark and somber presence.

“Sort of a tease that doesn’t come off too well,” Puggy says.

When the championship was completed, they were surprised when a warm and charming Duval came forth. They couldn’t realize that when he pulls on his dark cap, adjusts his dark shades and gets on his game face he’s like a fighter pilot climbing into his cockpit.

Duval had indulged some in the tour experience while still at Georgia Tech. In the U.S. Open at Medinah in 1990, he checked in with three first rounds of even par, with his coach on the bag. Then as a junior, he led the BellSouth Classic at Atlanta Country Club after three rounds. Each time, the fourth round was his Jonah.

“I’ve often said that he has the upper body of Nicklaus, the lower body of Norman and the determination of Hogan,” Puggy says. “I think he has the talent to challenge Tiger.”

However cold the facade, Duval is not without a sense of humor. On first making contact after the British, Blackmon opened with the greeting cliche, “How are things going?”

Said David, “Well, I did win the British Open, y’know.”

Furman Bisher is senior sports columnist at the Atlanta Journal-Constitution.
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Mapping the Mysteries of Life

Ponce de Leon never found the Fountain of Youth. Of course, Ponce had never heard of genomic computing, which is helping scientists fit together the missing pieces in the puzzle that is human life.

“We are on the precipice of an exciting era in which the rate of discovery and the rate of application of that discovery will be faster than any time in the history of mankind. I don’t know if that will be for good or for ill, but it certainly will be exciting,” says College of Sciences Dean Gary Schuster.

A groundbreaking development in the field of genomics took place in June 2000, when Celera Genomics of Rockville, Md., trumpeted the news around the world that it had completed a working draft of the entire human genome sequence. Launched in 1990, the Human Genome Project is jointly coordinated by the U.S. Department of Energy and the National Institutes of Health.

Goals for the Human Genome Project, expected to be completed in 2003, are to identify all the approximately 30,000 genes in human DNA; determine the sequences of the 3 billion chemical base pairs that make up the DNA; store the information in databases; improve tools for data analysis; transfer related technologies to the private sector; and address ethical, legal and social issues.

Schuster, who served as a moderator for a genomic computing program hosted by the MIT Enterprise Forum in Atlanta in May, says history shows us that scientific discoveries have been for both good and ill.

“In early human history, man harnessed fire,” Schuster says. “We used fire to warm our houses and light the night. But we also used fire to burn down cities.”

The sequencing of the human genome will give birth to scientific advancements that will give man incredible power, Schuster says.

“That power, just like fire, will be used for good and lives will be improved, health will be improved, people will be able to avoid the dreaded diseases we face today. Birth defects could be avoided or corrected. Who would trade that for the potential ills?”

Mark Braunstein, chairman and CEO of Patient Care Technologies and a participant in the genomic computing forum, sees the potential for remarkable medical breakthroughs.

“Genomics offers the prospect of actually understanding the basic functioning of life and, with that knowledge, gaining the means of curing and even reversing disease processes.

“No technology being pursued today, and I would say no technology likely to be pursued by mankind, has more potential than genomics,” Braunstein says. “Some even speculate that through genomics mankind will literally discover the Fountain of Youth and life expectancies of 150 years or more will become commonplace.”

Schuster says the Fountain of Youth remains elusive. Anti-aging advancements are likely, but don’t expect to see wrinkle-free centenarians running marathons anytime soon. “We’re still a very long way from extending human life expectancy beyond its natural limit.

“Everybody talks about how much longer
lives are, but that's because people are not dying young any longer. Children are not dying of cholera anymore. The average life expectancy has gone up considerably, but people are still dying of old age at about the same time.

"I think it very unlikely within the next 40 or 50 years that we're going to understand the biology and biochemistry of aging well enough to be able to manipulate it," Schuster says. "I think it is likely that we're going to see increased life spans because of the availability of replacement parts, whether those are artificial hearts or whether those are grown from stem cells."

Schuster also anticipates great advancements in the treatment of cancer. "Within the next five to 10 years, we're going to develop genetic engineering tools that will allow the control of the rate of cell growth. Therapies of the future will be much more directed toward the cancer cells and much more specific."

He believes chemotherapy and cancer surgeries such as mastectomies will one day be relics of the past. "Within the next 40 or 50 years, a lot of the medical procedures that are common today will be viewed as barbaric as blood letting was."

The importance supercomputers will play in the drug-development and disease-eradication processes is a matter of some debate. Peter Farley, CEO of BLOwulf in Savannah, stirred up the crowd at the genomic computing forum when he called a supercomputer a "big, stupid box, a fat abacus."

"It is likely that we're going to see increased life spans because of the availability of replacement parts, whether those are artificial hearts or whether those are grown from stem cells."

As scientists weave the genetic strands that make us human, society must untangle a host of ethical, legal and social dilemmas.

One particularly hot area of debate is whether insurers, employers and schools should have access to personal genetic information, says Roberta Berry, an associate professor in Georgia Tech's School of Public Policy.

"There has been speculation that if our society went crazy about the significance of this genetic information, you could have medical schools and other professional schools deciding whether to give precious slots to people based upon a reading of their genetic makeup," Berry says. "That is probably a little far-fetched because it's hard to imagine our society being
that way. It’s also the case that increasingly we realize that genetic information doesn’t tell who we are in any fundamental way.”

Berry says some argue that limiting insurance company access to genetic information could prevent decisions that were not actuarially justified. “They couldn’t use the genetic information as if your health history were laid out like a two-hour movie. But others will argue that, for insurance companies, genetic data is better than ‘I remember my aunt had this or that,’ so they should have access and treat it just like any other health information.

“Some people will argue for much stricter regulation because they fear abuse or disclosure. People disagree at a very high theoretical level about whether this kind of information risks a new kind of ‘geneticism’ in the same way we have experienced racism. If we allow any use of our genetic code, will it tempt people to label some as a genetic underclass based upon predispositions to certain diseases?” she asks.

“Other people will argue you’re getting carried away. When you’re looking at genetic readouts, you’re not going to find Type A and Type B. You’re going to find this huge read-out of all these variations, with very little understanding for a very long time of exactly what they mean. It’s going to be really complex data, so there’s no way people are all of a sudden going to say, ‘Here’s the good group and here’s the bad group.’”

Berry says a percentage of the Human Genome Project funding was set aside to study the ethical, legal and social implications. “Often, science and technology run ahead of our capacity to sort these issues out. They’re trying to jump-start the societal coping with these issues at the same time they’re doing the science and technology. At Georgia Tech, we have intense interest in both the science and technology and in studying ethical issues as we go along — thinking about the laws and thinking about the public policy aspects and what needs to be done.

“There is a sense, at least here at Tech, that we really need to work on this together because if we are going to realize benefits from these scientific advances, they can only occur within a framework of regulation and ethical and legal policy that makes it possible to avoid the dangers and harms. I’m hopeful we will be able to sort it out as we go along.”

Berry is prepared to take on the challenges in an era of promise and concern. She formerly practiced law, then taught it. While a visiting associate professor of law at Notre Dame, she learned about the university’s PhD program in the history and philosophy of science and is now writing her dissertation. Berry is in her third year at Tech, where she is teaching Constitutional Issues this semester.

“There are not going to be any easy solutions. It’s not as if there’s somebody sitting somewhere who knows all the answers and is going to tell us. It’s up to us. I think this is an important and unique juncture,” Berry says. “It’s not only a national issue, it’s a world issue. Scientists and technologists can’t be isolated from ethicists and lawyers. We also can’t be isolated from the global community in this conversation. These are huge challenges.”

She finds some encouragement in the stem cell research debate. “Here we’ve got a dilemma because we have a government of all of us and the question is funding of research that some individuals deeply and conscientiously believe presents a real ethical wrong. We have some people who just aren’t sure and other people who are quite persuaded that this is just a group of cells. People were talking about the issue. People had a real sense of what was at stake. I thought this was sort of the beginning of a national conversation that is going to get more and more complex.

“I have a feeling that aside from fears of crazy behavior — like cloning armies — there’s this kind of deeper underlying fear that’s not fully formed yet, that’s just sinking in. If presented with a technology that enabled me to clone someone, let’s say a child who has died, would I use it? If presented with the opportunity to genetically enhance my child, tweak this or that to get improved memory or greater physical agility, would I use it? One thing we have had in common throughout history is we’re all pretty much dealt the children we’re dealt. We love them as they are,” Berry says.

“What we haven’t thought through — and I think is the most frightening to us — is what does it mean if we have the power to modify ourselves genetically in some way?

“Would it be the case that we would find human beings appearing like fashion trends? The fear would be you’d be making that choice without realizing it. You would say it’s not just a passing fad to be pale and skinny and 6 feet tall. You’d say, ‘This is the best thing I can do for my child, just like sending my child to the best school and giving him piano lessons.’

“Some people would tell you these fears are way overblown, that it’s not likely to happen,” Berry says. “There’s a lively debate out there. There are some people who are really advocates about pushing forward on this and saying, ‘Hey, if we can improve the human race and make it smarter and perhaps less aggressive, why not?’ Maybe it’s the case we have this really nasty set of aggression genes and if we tweak those, the world will be a better place.’

“I think we’re going to be grappling with this 100 years from now. The first wave is what our generation and the generation now in our classrooms face. How we address these first wave issues is going to affect how they continue to be resolved over time,” Berry says.

“Whenever there are real big issues like this, the important thing is to get a start on them and realize you climb a mountain one step at a time. We had better start marching.”

— Kimberly Link-Wills
"Once you can map the DNA and the genes and identify them, you have set the basis for which an explosion in knowledge and care can occur."

"Certainly the decoding of the human genome is a very important event," Farley says. "Yeah, we’re gonna need computer power, but it’s being so overdone. There’s a critical missing word. Did anybody hear the word ‘software?’"

"The next revolution in biology is mathematical," Farley says, asserting that the overwhelming amount of data being generated only can be unraveled with new mathematics.

He says BIOWulf has hired 18 of the world’s top mathematicians. "It is, hands down, the world’s most powerful mathematical group. We set up a ‘math-topia.’ A third, maybe half, the work they do is totally theoretical, but it is moving the field forward. We are filing three or four patents a month."

Schuster concedes that computers are "amazingly stupid. They only do what you tell them to do, they don’t do what you want them to do. But they are very, very powerful tools and, when applied appropriately in the hands of creative scientists or mathematicians, computers can address very important questions."

"There are things that supercomputers do extraordinarily well that can’t be done any other way. There are massive calculations in chemistry, biology and physics to try to understand the nature of chemical reactions that require the ability to manipulate many particles, electrons and nuclei. Supercomputers do that extraordinarily well," Schuster says.

Tech alumnus Mike Keehan, MS Phys 87, PhD 90 (see story, page 24), told the audience at the MIT Enterprise Forum that he is counting on supercomputers to improve human life. "For any of you who have had a serious disease, you know you’ll do anything to make it go away. I myself have had that."

"Supercomputers are a tool in the process of discovery," says Keehan, founder, president and CEO of NuTec Sciences, an Atlanta-based company that controls the world’s first and third fastest commercial supercomputers.

"Math is certainly an important part of solving the problem but it’s not the complete solution. You still have to design a drug. You still have to develop a drug. You still have to have a doctor provide patient care. All the things we’re talking about would be tools, tools to be applied or used in combination to extend people’s lives."

"The Human Genome Project is everything," Keehan says. "It’s the granite foundation of the improvement in care overall. The real fun starts now that it’s done. Once you can map the DNA and the genes and identify them, you have set the basis for which an explosion in knowledge and care can occur. For the first time in the history of humankind, we know the genes and where they are."

Keehan also knows Atlanta is the ideal location for NuTec’s headquarters. "The rest of the country is looking over Georgia’s shoulder. We were attracted to Georgia because we need access to intellectual property. We need access to well-trained students. But more importantly, we need access to a kind government and a very brotherly business community."

Speaking briefly at the Enterprise Forum, Mike Cassidy, MS TASP 87, president of the Georgia Research Alliance, hailed the field of genomics as an "opportunity of a lifetime" for the state.

"We believe there is a very strong case to be made for Georgia to emerge as a national leader in the fields of genomics and bioinformatics," Cassidy says. "The GRA is assembling research faculty who have achieved international prominence in their fields of study. We’re creating an environment where these investments in science do become the basis for commercial development."

Gov. Roy Barnes is counting on investments in science paying off. Speaking via videotape, Barnes said the Georgia Cancer Coalition was launched in November 2000 and will receive as much as $1 billion from the state to build a "world-class comprehensive cancer control program."

"The Georgia Cancer Coalition promises great economic benefit as well. Not only will we save lives, we’ll attract pharmaceutical
There are astonishing opportunities for antibiotics, for understanding the resistance to disease, the genetic basis for such resistance and how to develop effective, novel therapies.

Dean Gary Schuster says supercomputers may be able to do the massive calculations necessary to manipulate many particles, electrons and nuclei that give insight into human chemical reactions.

comprises to the state to conduct extensive clinical trials in our hospitals and medical centers. The ingenuity of our entrepreneurial and scientific communities will generate new businesses and new jobs," Barnes says.

Schuster says much work remains to be done. "The Human Genome Project was a monumental task and it was a milestone. But it really is the starting point and not the finish."

Sam Broder, executive vice president for medical affairs at Celera Genomics, played a crucial role in the sequencing of the human genome. At the genomic computing forum, he illustrated how far scientists already have come by pointing out that it took 10 years to fully sequence and assemble the e coli genome.

"Now some bacterial genomes can be done in a matter of days. There are astonishing opportunities for antibiotics, for understanding the resistance to disease, the genetic basis for such resistance and how to develop effective, novel therapies," Broder says.

"Some of the things we are learning are astonishing in their scope," he says. "We believe there are approximately 30,000 [human] genes. A couple of years ago you would have said there were 100,000 genes. There was an unspoken, and sometimes spoken, belief that the complexity of an organism was in part derived from the number of genes it had.

"We still do not have the capacity to undo substantial errors in the genome, in the genetic code that lead to predisposition to certain illnesses. That's going to be our challenge." GT

**DNA**

*The Molecule of Life*

Trillions of cells

Each cell:

- 46 human chromosomes
- 2 m of DNA
- 3 billion DNA subunits (the bases: A, T, C, G)
- 80,000 genes code for proteins that perform all life functions

Diagram courtesy DEO Human Genome Program
Mike Keehan is just a man, but a man with enough computer power to change the world. Keehan, MS Phys 87, PhD 90, has made a lot of money using his knowledge and computer strength to isolate the best drilling sites for oil companies. Now he has moved the headquarters of his NuTec Sciences from Houston to Atlanta and poured millions of dollars into assembling the world's fastest privately owned commercial supercomputer to battle a personal foe — cancer.

"We are building a cancer informatics system for Emory Health Care. It's the first of its kind in the world. It will integrate genetics, clinical data and research data together into one software package of all the information — X-rays, blood gases, MRIs, demographics, the genomics side. All of this will be visible in a single software system," Keehan says.

"I'm really proud of the energy business, but the life sciences business gets me overly excited because of the chance to touch people as individuals and raise the survival rate of cancer patients, having been one myself."

Keehan underwent surgery for colon cancer three years ago. He refused chemotherapy when his doctor was unable to provide statistics showing proven benefits of the treatment or survival odds more accurate than 50-50.

"I thought to myself, 'I need to get into this business because people are dying. I have the biggest computers in the world. I can get the top talent. I will work on this problem myself,'" Keehan says. "Four months after I had cancer surgery I opened the life sciences division.

"The cancer informatics system is about faster diagnosis but, more importantly, it's about matching the right treatment to the disease. What they can do with genomics is look at all the clinical data, pull in all the outside information and, if they find a match, they can find out which drug is currently working best for a certain type of cancer," Keehan says.

"What they do now is give everybody a
huge dose of chemotherapy. Basically, it's just like war. They pour all this stuff in your body and they carpet bomb it. The current technology just lays waste to the body.”

New technology will arm doctors with “smart bombs,” Keehan says. “If they could target the cancer and the type of drug to the genetics so that you get maximum benefit, then the treatment for cancer five years from now will be totally revolutionized, not evolutionized.”

Keehan says when the cancer informatics software is ready to use by the end of the year, Emory will have a direct link to NuTec’s supercomputer and can begin doing amazing things. “We’re going to spend the whole next year tying it down and unleashing this thing. By December 2002, they’re going to have one helluva fast system. There will be just about no question they can’t answer quickly.

“They expect within a year to walk up to a patient with a laptop, type in his symptoms and pull up all the other people out of their database who have the same symptoms, tap into the national public databases, send it to the supercomputer and get a match within an hour. Then they can go back and talk to the patient about treatment.”

Keehan says NuTec’s partnership with Emory Health Care will put the Atlanta research hospital at the forefront of cancer breakthroughs. The software technology and supercomputer put NuTec in demand as well. “Five other cancer centers have already asked to get involved. We put them off right now. This is a partnership between NuTec and Emory. Once you’ve built it with one, it’s easy to modify it for others.”

The supercomputer will allow Emory to do the research and write papers in weeks instead of months or more, making the informatics system attractive to research hospitals around the world, says Keehan, who anticipates a demand for multi-million-dollar license fees.

Keehan’s motives are not strictly financial. “Until you’ve had your life taken away,” you can’t comprehend the desire to change cancer treatment, he says.

NuTec is assembling its super weapon inside the IBM tower in midtown Atlanta. Only two-fifths assembled, it already looks more like a massive locker room than one of the world’s most powerful tools. Gigantic cooling units have been brought in, the floor has been reinforced and miles of wires have been laid. The first shipment, only one-fifth of the total supercomputer, arrived from IBM in December on three semi-trailer trucks.

When completely assembled, the mammoth supercomputer will take up about 25,000 square feet with its 512 refrigerator-sized units, each stocked with 32 processors. The “list price” for a supercomputer packed with 5,000 central processing units is just under $90 million.

“There’s not a single company that has as much computer power as we do,” Keehan says. “We can do much better science and get much better results quicker — a hundred times quicker, a thousand times quicker.”

Speed and accuracy are the name of the game. Keehan’s software has increased his petroleum customers’ drilling success rate from 30 percent to 70 percent. With two oil technology world patents, NuTec now has 20 oil companies as clients. A facility in Houston remains

“Tthere’s not a single company that has as much computer power as we do. We can do much better science and get much better results quicker — a hundred times quicker, a thousand times quicker.”
the hub of the company’s energy business. European oil customers are served at NuTec’s third site, in Manchester, England.

“We’re three times faster than anyone expects. That’s our routine technology, technology we’ve been running for more than five years now,” Keehan says. “The sophistication of the technology is all related to the turnaround time. There are solutions we can come up with as physicists that would be the exact solution, but it would take 10 years to do it. Nobody is going to wait 10 years to get the answer.”

Keehan isn’t waiting for someone else to improve disease treatment. “The life sciences business is a combination of software and computing with molecular chemistry and scientific analysis. I think we can improve the drug discovery process by up to two times, just like we did the exploration business in petroleum. People will pay a lot of money for that.”

NuTec has turned a profit from the day it opened for business. In the first year, from May to December 1995, the company generated $280,000 in revenue. After three years, profits grew to $10.8 million. Now, in its seventh calendar year, NuTec is expected to bring in nearly $20 million.

“We bring together supercomputing, technology and software so that scientists can do better analysis. We’re talking to several pharmaceutical companies who want us to build the same kind of systems for them that we built for petroleum. They know we’ve done it before. Next year, after eight years in business, I’d expect we’d be in the $30 million range.”

As a child, Keehan never pictured himself as a scientist with a multi-million-dollar business. But even as a boy, he had a knack for making money. By the time he was 15 years old, he was clearing nearly $20,000 a year by doing landscaping in Westport, Conn.

Keehan enjoyed working outdoors and, while a film and advertising major at Southern Methodist University in Texas, he planned to one day launch his own construction company. A motorcycle accident changed all that. His injuries included a broken femur. He lost a chunk of his leg and received an artificial hip. In the 11 months he was hospitalized, Keehan came close to death from a staph infection more than once.

He would always walk with a limp and would always be in at least some degree of pain. A physical job was out of the question. Having watched how the medical profession operated from within a hospital for nearly a year, Keehan decided he could do better and planned to pursue a career as a physician.

Keehan transferred to the University of Connecticut to study pre-med and recuperate at his parents’ home. He breezed through math classes and did well in biology and chemistry. Then came physics, which stumped him.

During spring break, Keehan, still hobbling on crutches, couldn’t do much except study. He struggled to understand physics. “All of a sudden I got it!” he recalls. He did so well on his next physics exam that the professor asked him if he had seen the test beforehand. Not only did he understand it, he was hooked. He changed his major, then pursued a master’s degree and doctorate in physics at Tech.

Keehan looks back on that motorcycle accident as a “life-altering event,” one that steered him away from a career in construction. Fate changed the course of his life’s work again more than 15 years later when he was diagnosed with cancer.

He underwent cancer surgery on a Friday and returned to NuTec’s Houston office the following Tuesday. When Keehan opted to forgo the chemotherapy, he didn’t turn to alternative treatments. He drowned himself in work by day and in alcohol by night.

NuTec continued making money from its work with oil companies, and Keehan launched the life sciences division. He moved NuTec — and his family — to Atlanta. Finally, after more than two years of running a high-tech business with a low-tech hangover, Keehan realized that he needed to be clearheaded if he was going to destroy the disease that had tried to kill him.

A conversation with his mother-in-law, a cancer patient, reminded Keehan that he has valuable contributions to make. “She said, ‘Can’t you hurry with your software?’ It was heartbreaking. I let everything else go. I had to focus. I rededicated my life.

“I am convinced that I can work in life sciences and provide a better success rate to drug discovery and improvement in patient care. I’m convinced of it because I went through the process and it was dismal.”

Despite his supercomputer power and desire to change the world, Keehan says he’s not Superman.

“I am just a man. I know this because my hip hurts.” GT
Broadband telecommunications is on a roll in Georgia. Believe it. The Yamacraw broadband design program is helping Georgia create over 2,000 attractive jobs for new engineers with powerhouses here like StarCore, National Semiconductor, Ciena, Wi-Lan, EchoStar, Broadcom, Nortel Networks, IDT, MicroCoating Technologies, Barco, Cirrex, Cypress, Movaz, BellSouth, H.O. Systems, RF Solutions, Luxcore, SecureWorks, Ardext Technologies, Quantira Technologies, and IVivity. If your life is Broadband, live it in Georgia midst a marvelous climate, a wealth of natural resources and recreation and a favorable cost of housing and living. To submit a resume into the jobs database or for more surprising information, visit [www.yamacraw.org/jobs](http://www.yamacraw.org/jobs).
2000-2001
Celebrating Our Successes

Annual Report
The Georgia Tech Alumni Association
### Where Our Funds Come From

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### A Year Of Outstanding Alumni Achievements

**By David M. McKenney**  
Phys 60, IE 64

It is sometimes too easy to take accomplishments for granted. After a decade of national prosperity, fiscal year 2000-01 was one of economic adversity. During such uncertain financial times, ambitious goals can be ambushed. But you made it an outstanding year at the Alumni Association — financially and in many other ways. It has been a privilege to serve as your president.

You helped us achieve two milestone financial goals last year. With the support of 25,270 alumni and friends, the 54th Annual Roll Call, which ended June 30, exceeded its $8.2 million goal.

Six months earlier, you brought our five-year Campaign for Georgia Tech to a fantastic close, raising $712 million. In the campaign ending Dec. 31, 2000, every single department, school and college exceeded its goal.

After that kind of achievement, the Roll Call may seem like frosting on the cake. But it's not. That's our bread and butter. It's what we do year after year to bring vital unrestricted dollars to Georgia Tech, enabling President Wayne Clough to spend where the need is greatest. Since every dollar from the state is designated, these unrestricted dollars are critical to Tech's well-being.

The successes of Roll Call and the capital campaign were certainly cause for celebration, and the 2001 Presidents' Dinner at the Georgia Dome was spectacular. As your president, it was my honor to join President Clough and Georgia Tech Foundation Chairman John Staton in hosting this event, which nearly 1,400 of you attended.

Homecoming launched a new tradition called Buzz Bash attended by more than 600 members of our Tech family. We staged more than 200 different alumni events engaging nearly 50,000 alumni and friends. Our Alumni Career Conference attracted nearly 1,000 alumni and more than 100 companies. Our Georgia Tech clubs are growing and number nearly 80 across the country. Our **Tech Topics** newspaper goes to 98,000 alumni and friends, our **ALUMNI MAGAZINE** to more than 30,000 Roll Call supporters and our revamped electronic newsletter **BUZZwords** has a circulation of 20,000.

Our alumni Web site, gtalumni.org, attracted a whopping 850,000 visitors. While fund raising is our bread and butter, service is our meat and potatoes. It has been a pleasure to serve you as Alumni Association president.
How We Serve Alumni

Total Expenses ..... $5,771,783

- Administration ......................... $1,847,714
- Career Development .................... 304,675
- Communications .......................... 877,888
- Alumni Relations & Business Development .......... 805,986
- Roll Call .................................. 751,297
- Campus Relations ......................... 402,936
- Event Management ....................... 534,432
- Marketing Services ...................... 246,855

The Mission of the Georgia Tech Alumni Association is to serve our alumni and promote the Institute. We will continually create relevant and meaningful programs for current and future alumni to foster lifelong participation and philanthropic support. We will communicate the achievements of the Institute and our alumni, maintain its traditions and strengthen relationships with the campus community. Underlying all that we do is the belief in the value of education, the commitment to integrity and exceptional customer service, and a pledge that we will perform in a fiscally responsible manner.

The Georgia Tech Alumni Association is organized into eight departments:
- Administration
- Alumni Relations/Business Development
- Campus Relations
- Career Development/Human Resources
- Communications
- Event Management
- Marketing Services
- Roll Call

Administration
Accounting, database management, computing services and building management

While Accounting was keeping the budget balanced to within $300 by the fiscal year's end, Computing and Information Services maintained the Association's growing database of more than 110,000 records. Sections of all five floors of the Alumni/Faculty House were renovated to create new office space and work stations to improve productivity. As a result, we were able to group associates with their departments and enable Alumni Career Development to move from its Student Success Center location, bringing all Association departments into the same building.

Alumni Relations/Business Development
Alumni clubs and groups, travel programs, affinity programs, advertising and merchandising

Nationwide, the Alumni Association has 65 clubs. Fifteen more clubs are being renewed and five additional clubs are being started. Alumni participated in more than 200 club events this year, and clubs in 15 cities hosted the third annual Coaches Spring Golf Tour and Banquet, raising more than $50,000 for Georgia Tech academic and athletic scholarships. Speakers of note included President Wayne Clough, Athletics Director Dave Braine, football coach George O'Leary, basketball coach Paul Hewitt, the voice of the Yellow Jackets Wes Durham, Associate Vice President for Enrollment Barbara Hall and Executive Director for Institute Communications and Public Affairs Bob Harty.

The Club Scholarship Program awarded $199,164 to 137 students from across the country. This is an 8 percent increase in dollars and 20 percent increase in scholarship winners. Thirty-nine alumni clubs participated in the program, and 11 clubs now have scholarship endowments.

Next Generation Weekend was expanded into a two-day event for alumni and their high school-aged children. More than 200 alumni and
Building Your Lifelong Connection To Georgia Tech through Alumni Association activities ranging from career conferences to Homecoming.

children attended. Proceeds from the event went to fund the inaugural Alumni Association Legacy Scholarship, which was awarded to Michael Meisner, son of Larry Meisner, IE 70, in April.

The Ramblin’ Recruiter Program engaged alumni volunteers from across the country to help recruit prospective students at 120 college fairs.

Leadership Georgia Tech, the Association’s annual club officers training conference, was held on campus in September 2000, drawing 70 volunteers from 35 clubs across the country.

The Alumni Association joined with the Athletic Association in hosting tailgate parties and bus trips at six away football games that were attended by more than 1,000 alumni and friends. More than 500 alumni traveled on chartered buses to watch the Jackets defeat Clemson and Georgia on the road.

The Association developed a strategy for supporting groups with similar Tech-oriented interests. Groups such as the Tech Alumni Band, Minority Affairs Committee, Georgia Tech Young Alumni Network and Georgia Tech Lacrosse have all embraced this new strategy, which is built to promote Georgia Tech in new ways.

Through Georgia Tech Travel Adventures, more than 300 alumni and friends traveled on one of 15 journeys to more than 20 destinations around the globe. Destinations included Kenya, Switzerland, Egypt, Peru, Ireland, Russia, France, Italy, Germany, the Galapagos Islands and England. The travel program also featured a couple of new trips specially designed for young alumni and for families.

Royalties from MBNA Alumni Association credit cards topped $459,000, while income from the Worldcom Alumni Savers program reached $185,000. Merchandise sales totaled $78,626, advertising in Alumni publications brought in $152,928 and event sponsorship totaled $22,900.

Campus Relations

Student organizations and programs, campus initiatives, parent relations and Family Weekend.

Student Ambassadors participated in nearly 80 events across campus and the Student Alumni Association.

Career Development/ Human Resources

Alumni career services and Association human resource systems

Career Development won a top national award from the Council for the Advancement and Support of Education for
Alumnus Chris Klaus speaks to an overflow crowd at the Career Conference. ABOVE: Parents join their Tech students for a Family Weekend luncheon.
Celebrating a year of triumphs in fund raising, alumni activities, athletics, scholarship and campus life.

its innovative services. It received a Circle of Excellence Award recognizing its management of four major programs: GT Alumni JobNet, a Web-based job posting system; annual Alumni Career Conference, a job fair attended by about 1,000 alumni; Educational Speaker Series, presentations and workshops by industry experts; and Advisement/Networking, which includes such services as résumé review, instruction on interviewing techniques and job search strategies.

More than 1,000 alumni and 100 companies attended the 18th annual Alumni Career Conference at the Cobb Galleria Centre. Alumnus Christopher Klaus, founder of Internet Security Systems, was the luncheon speaker. The Alumni Career Conference grossed $139,134 in revenue.

Career Development advised approximately 300 alumni and produced three career workshops that attracted a total of more than 400 alumni.

More than 7,000 alumni registered for GT Alumni JobNet, and more than 2,100 alumni résumés are in the system. More than 300 companies posted 842 jobs during the year on JobNet, which brought in revenues totaling $137,406.

Human Resources introduced a program for recruiting and training employees, sharpened the focus for employee professional development and began a new employee performance appraisal system.

Communications

Produces alumni publications, BUZZwords and directs the Living History program

Communications publishes two quarterly periodicals that serve as the primary news link between Georgia Tech and its alumni. The Georgia Tech Alumni Magazine has a circulation of more than 32,000 Roll Call donors, faculty and staff, and Tech Topics, a tabloid newspaper, has a circulation of 98,000 alumni and friends. The Alumni Magazine focuses on technology, the management of technology and alumni successes. The office also publishes the Alumni Association Annual Report.

Tech Topics received the Grand Award for tabloid publications from the Council for the Advancement and Support of Education District III at its annual meeting in Atlanta. BUZZwords, which started as an electronic newsletter in 1995, was redesigned and launched as a monthly online magazine in January 2000. Its circulation jumped from less than 4,000 to 20,000.

The Living History Program produced 17 video projects, including documentaries on Georgia Tech's first graduate H.L. Smith, drown-proofing instructor Freddie Lanoue and coach John Heisman. It also conducted 69 interviews and created a Web page for each interview.

Event Management

Plans and stages Homecoming and many other Association events

Event Management engaged more than 45,000 alumni through more than 200 events ranging from the George C. Griffin Pi Mile Road Race to home football tailgates. The centralization of event planning has led to greater efficiency and a higher standard of professionalism for Association events.

Homecoming included all of the favorite traditions, along with a new tradition, Buzz Bash, an all-alumni reunion party that was a hit with alumni and families. The Event Management planning team partnered with Campus Relations, Roll Call, Career Development and Alumni Relations to produce Family Weekend, Phoenix Dinner, Alumni Career Conference, Leadership Georgia Tech and the Peach Bowl Tailgate. Event Management worked with Roll Call to make the Presidents' Dinner a spectacular celebration marking the end of the five-year Campaign for Georgia Tech.
Marketing Services
Researches and analyzes data from alumni studies to help shape the Association’s strategies and planning, builds and maintains the Association’s Web presence.

Marketing Services collected and analyzed data from alumni participating in major Association events, including Homecoming, Family Weekend, Next Generation Weekend, T Week, Leadership Georgia Tech and the Alumni Career Conference. The department also conducted focus groups for Minority Affairs Committee, Roll Call, Web, alumnae and Campus Relations; conducted surveys for Georgia Tech clubs across the country.

The Web site recorded 845,000 user sessions, almost 200 percent over our goal, and fostered electronic networking among alumni using an online directory, “listservs” and free hosting services and technical consultation with customized Web site templates for clubs, free e-mail forwarding with a Tech address and online purchasing.

The department began entrepreneurship programming and organized a panel discussion featuring alumni entrepreneurs during Homecoming.

A paper, “Young Alumni Research at Georgia Tech,” was presented at the fourth Annual AIR/CASE Research Colloquium and a market research tutorial was presented at the Atlantic Coast Conference Alumni Directors Consortium, national Council for the Advancement and Support of Education conferences, Georgia Education Advancement Council and annual meeting of the Jesuit Advancement Association.

Roll Call
The Association’s annual giving program
Roll Call is the single largest source of unrestricted funds at Georgia Tech, representing the broadest base of support for the Institute. Unrestricted funds provide for student scholarships and financial aid, assist the Institute in recruiting and retaining top faculty, and support new academic programs. More than 25,000 donors contributed to the 54th annual Roll Call total of $8.2 million.

The Roll Call uses research-driven direct marketing and telemarketing and personal contacts to manage a program that leads all public institutions in the percentage of alumni annual giving. Tech is the No. 1 public university for alumni annual giving, according to rankings of U.S. News & World Report, which measures the percentage of each school’s alumni who contribute.
Making
The stares never seem to stop. Ron Peterson would be hard-pressed to say which hurt more — the sideways, piteous glances out of the corners of their eyes or the wide-eyed open-moutheed gawking.

People stare hardest when Peterson’s arms flail herky-jerky while he tries to find his subway pass or when his torso abruptly writhes in spasms, threatening to burst the restraints keeping him in his wheelchair. If they make contact, they usually speak loudly and slowly, apparently unaware that the man with the twisted limbs and garbled speech has no hearing disability and can clearly
hear and understand every word they say.

Peterson, 31, has been fighting a hidden enemy since he was 5 years old. He suffers from dystonia, a neurological movement disorder characterized by involuntary muscle contractions that force his body into abnormal and often painful positions. As is true with most neurological disorders, intellect, cognition and the senses — including vision and hearing — are not affected. Although it is not fatal, there is no cure for the disease and it often leaves its victims impaired to a point where they have a difficult time living independently. Peterson, however, is able to live on his own in a mid-town Atlanta apartment.

On Dec. 6, 2000, Peterson, resplendent in his cap and gown, motored his electric wheelchair across the stage at Georgia Tech’s Alexander Memorial Coliseum and received his master’s degree in Computer Science. It was, he says, his crowning achievement in a life filled with difficulty.

In 1975, Reid and Virginia Peterson noticed their 5-year-old adopted son favored his left foot when he walked. His toes began to turn in. They took note but were not overly concerned. Six months later, Peterson’s voice began to crack when he spoke and his right hand began shaking slightly. The parents turned to doctors in Lawrenceville, Ga., for help.

“They all knew something was wrong,” Peterson says. “But they had no clue what it was. I went through a full battery of tests and there was no acknowledgment of anything wrong. All we knew was that I was getting worse.”

Peterson’s condition quickly deteriorated as doctor after doctor failed to diagnose the problem. By the time he was 8,
Peterson’s hand shakes had escalated to full-blown tremors. The desperate parents took their son to Emory University Hospital in Atlanta.

“We went to a neurologist who ran tests,” he says. “And he recognized it as dystonia.”

A second opinion confirmed the diagnosis.

Meanwhile, Peterson’s fingers curled into clenched fists and his legs intertwined like little pretzels. Doctors tried using a relatively new drug, L-dopa, but it had little effect.

“After the drug therapy didn’t work,” Peterson recalls, “they decided to try cryogenic brain surgery. We went to the Westchester Medical Center in New York for the operation. I had to remain awake during the surgery because they used a long probe filled with liquid nitrogen and inserted it in the brain. When they would find an area related to motor functions, they would freeze it. I had two surgeries when I was 11, but neither worked very well.”

The surgeries inflicted deep trauma to his brain and Peterson says all his body could do was breathe and keep his heart beating — he had lost all other motor control. He had to relearn to do everything.

Despite the physical toll on his body, Peterson excelled in school and graduated in 1987 from Berkmar High School in Lilburn, Ga.

He applied to six colleges — Georgia Tech, the University of Georgia, Florida State, South Carolina and Michigan State universities and St. Andrew’s Presbyterian College in Laurinberg, N.C.

He discovered the St. Andrew’s campus, unlike the other schools, was barrier free — mentally and physically — for disabled students. He thrived in the nurturing environment of the small school and graduated in 1991 with two bachelor’s degrees — one in chemical physics and one in mathematics.

An attempt at graduate school at the University of Tennessee was short-lived. Peterson came to Georgia Tech in 1996 to work toward his master’s. Despite the physical challenges, he doggedly pursued his goal.

“Ron was one of the most motivated, self-reliant students I’ve ever known,” Dan Carlson, assistant dean of students and coordinator for students with disabilities, says. “He never let his disability deter him from his goal. He would call on you if he really needed help, but he preferred to make his own way.”

That self-reliance and motivation resulted in him being awarded the 2001 Georgia Institute of Technology Perseverance Award, given annually by the Center for Enhanced Teaching and Learning and the Dow Chemical Co. Foundation to the student who has had to overcome many obstacles while trying to attain a Tech degree.
"A CHANCE IS ALL I EVER ASKED FOR. I LOVE WORKING [WHERE] PEOPLE TREAT ME NO DIFFERENTLY THAN ANYONE ELSE. I'M A PROFESSIONAL DOING MY JOB."

George Riley is a doctoral student and graduate assistant at Tech who taught Peterson in two of his most demanding courses.

"Operating Systems classes at the graduate level are particularly difficult," Riley says. "They are required classes for graduate students, and we make them extremely difficult. Ron wasn't the top student by any means, but it was amazing that he could do it at all. A lot of the out-of-class work involved writing extremely lengthy programs, which means you have to sit in front of a keyboard and type for hours. Ron could barely type. He could only use one finger and maybe make one keystroke a second. He was at such a severe disadvantage — it would always take him several hours longer than anyone else to finish his work, but he always got the job done. I was amazed that he could do it."

A bright orange pennant bobs atop Peterson's wheelchair as he glides down the sidewalk from his midtown Atlanta apartment en route to his job at the Centers for Disease Control offices in Chamblee, Ga. It is a difficult journey involving the city's subway and bus system and a myriad of transfers.

He has been employed there full time since graduation as a computer programmer specializing in Java programming. He works on the data web, a large system that combines social databases from the CDC and other government agencies. The system allows researchers to study birth and death records, disease surveillance and incidents of disease as far back as 40 years. It's a complex job in which the programming language alone can change as often as every few months.

Ron Chapman, branch director of the epidemiology program at the CDC, is Peterson's boss. He readily admits that he had concerns about Peterson's health issues.

"I didn't hire Ron, but when I began working here, I decided to be open-minded about it," he says, "although I was dubious that he could be a fully productive member of the team. It's easy to get the impression from his speech and his physical mannerisms that he wouldn't be up to the job, but Ron has proven himself to be fully capable. Computer programming is one of those areas where people with disabilities can be as productive as anyone else."

In his small cubicle, surrounded by programming manuals and a framed photo of his newly acquired kittens, Tim and Cindy, Peterson uses his one good finger, studiously pecking codes into the computer.

"A chance is all I ever asked for," he says. "I love working here because the people I work with treat me no differently than anyone else. I'm a professional doing my job — making my contribution. That's all I ever wanted to do."
**Extraordinary Accomplishments**

**Tech assistant professors garner highest number of coveted CAREER Awards**

By Karen Hill

Photography by Gary Meek

Andres Garcia is working to engineer surfaces to "talk" to cells and control their functions. His wife, Michelle LaPlaca, is studying how the force from a traumatic injury whips through brain cells and deforms them. Garcia, in mechanical engineering, and LaPlaca, in biomedical engineering, are two of 13 Georgia Tech assistant professors who received the National Science Foundation’s coveted CAREER 2001 Award in recognition of extraordinary accomplishment.

CAREER Awards were also presented to Jeffrey Davis, electrical and computer engineering; Reginald DesRoches, civil and environmental engineering; Faramarz Fekri, electrical and computer engineering; Paul Hasler, electrical and computer engineering; Pinar Keskinocak, industrial and systems engineering; Tim Lieuwen, aerospace engineering; Frank Loeffler, civil and environmental engineering; Beth Mynatt, computing; Charles D. Sherrill, chemistry and biochemistry; Thad Starner, computing; and Linda Wills, electrical and computer engineering.

Tech’s 13 CAREER Awards are the largest number presented to faculty at one university since the program began in 1995. Tech vaulted to No. 2 in the nation in the total number of young professors who have won CAREER Awards, moving ahead of the Massachusetts Institute of Technology and narrowing the distance from the University of Illinois.

Illinois has 65 of the award winners, Georgia Tech 59 and MIT 58.

"The CAREER Award from the NSF is a singular recognition of extraordinary accomplishment for a young faculty member who shows great promise for the future," says Tech President Wayne Clough. "Having almost 60 of our faculty receive this award is remarkable and shows that we are building a university that has greatness in its future.

"The fact that we are among the very top institutions in this recognition is a clear sign that our momentum is strong and growing," Clough says.

Each winner receives between $50,000 and $100,000 a year for four to five years to spend on equipment, supplies and assistants, both graduate and undergraduate. On average, the NSF receives nearly 2,000 applications per year for CAREER Awards, Tech officials estimate. About 350 of those applicants each year win an award.

In 1997, Steve McLaughlin was one of 12 Georgia Tech professors to receive a NSF CAREER Award. He also won that year’s NSF Presidential Early Career Award for Science and Engineering, which the NSF says is “the highest honor bestowed by the United States government on scientists and engineers beginning their independent careers.” It comes with double the award money over the same four- to five-year period.

Four years after winning CAREER and Presidential awards, McLaughlin is bringing to market his idea for a new computer chip that triples the storage capacity of reusable compact discs and digital video discs.

“My focus is putting more bytes on a disk, making the systems cheaper and more reliable,” says McLaughlin, a 39-year-old associate professor of electrical and computer engineering.

McLaughlin’s chip will be sold this fall through Calimetrics Inc., an Alameda, Calif.-based company. The chips will be used to increase the storage capacity of recordable and rewritable CDs and DVDs, such as the ones people use to “burn” a mix of favorite tunes. The recording drive will allow for three times as much storage on both new and old CDs.

McLaughlin says the CAREER and PECASE awards supported the basic research that went into his chip. A separate $20 million award from the National Institute of Science and Technology helped bring it to market.

“The potential commercial impact could be very, very large. The number of units sold per year is tens of millions,” McLaughlin says.

McLaughlin already has an eye on his next research project: the digital video recorder, designed to replace the cassettes that run in VCRs.

This year’s award winners are focusing on a mind-boggling array of research, ranging from theoretical models of molecules as they slide from one form into another, to a wearable computer. Students, including undergraduates, are aiding in the projects.
Four years ago, Steve McLaughlin won CAREER and PECASE awards for his research into compact disc storage capacity.
Andres Garcia, 32, is using lessons from biology to construct "hybrid" surfaces, part biological and part synthetic, that cells will recognize and adhere to. Research could show scientists how to build bone tissue and identify drugs that have fewer side effects.

"We're engineering 'bio-inspired' surfaces to mimic biological substrates that control cell adhesion in order to direct cell signaling and function," Garcia says.

For now, this research concentrates on the interactions of bone cells with engineered model thin films, but it has wide-ranging potential applications in biotechnological applications, such as controlling cell differentiation for pharmaceutical applications; tissue engineering, which involves combining cells with materials to create a functional tissue in the lab; and the development of new implant surfaces for common biomaterials, such as hip implants.

"So far, we've had a lot of fun doing this work and we have several surprising and interesting findings that are very promising in terms of the successful application of these technologies," Garcia says.
Brain Cell Regeneration

Michelle LaPlaca’s research on traumatic injury to brain cells someday could help people recover faster or more completely from brain injuries.

“We want to tease out how that force is transduced in the cell, to elicit the biochemical and molecular changes in the cell that may lead to cell dysfunction and death itself,” says LaPlaca.

Understanding those changes, she says, will give researchers a better understanding of a cell’s resiliency. It can also help them develop drugs to improve recovery.

Especially noteworthy, LaPlaca says, is that her research is based on three-dimensional cell cultures, one dimension more than most studies. Three dimensions more accurately reflect the environment of the brain.

LaPlaca plans to take specific measurements of brain-injury phenomena.

“We know that the membrane becomes permeable, that ions-calcium, for example, rush in, that there is mass depolarization of the tissue,” she says. “We will modulate the extracellular environment in order to identify those molecules responsible for shifting cell deformation into chemical and electrical signals — signals that may measure the changes in the cytoskeleton, to the organelles.”

The research could lead to neural tissue engineering developments that could answer the question, “What would make a cell want to regenerate?”

“It may be that the extracellular environment needs to be improved, or it may be that we need to provide some helper cells,” she says. “We know that the brain can regenerate. We have to provide the right environment for that to occur.”

LaPlaca says her research has potential for a wide array of related problems and disorders, including degenerative diseases that break down nerve cells and strokes.
Fast-Track Research

Chemists know what a molecule looks like at Point A, before it begins a chemical reaction. They know what it looks like at Point Z, when the reaction is complete. It's Points B through Y that are unclear.

David Sherrill, 31, is investigating what happens during that middle period. It's theoretical research that could lead to many applications, including improving cancer-fighting drugs.

"It's still a challenge to describe molecules while they're reacting, making and breaking chemical bonds," Sherrill says. "The current models are very bad for that."

Sherrill's work involves just himself, his student assistants and a very fast IBM supercomputer. There are no beakers, no chemicals, no laboratories.

The supercomputer, installed last October, is one of the fastest academic supercomputers in the Southeast. It can run simulations in a few hours that would take weeks on smaller computers.

Speed is important. Sherrill's work has several practical applications, including improving a type of anti-cancer drugs called enediynes. These drugs undergo special reactions to become "diradicals," which kill cancer cells by attacking their DNA.

Unfortunately, no one knows exactly what's happening during those reactions, Sherrill says. A clear understanding of the mechanics could ultimately lead to better medicines and more efficient treatment.

Sherrill's work mainly involves writing computer models, then watching as the computer spits back where he went wrong. He fixes that "hole," then waits for the computer to find the next one.

"You're always making some kind of progress," Sherrill says. "If you keep trying something long enough, you'll get an insight that leads to new ideas and new directions."
Technology to the Rescue

Technology to the Rescue

Ted Starner believes computer technology can enable elderly or disabled people to have a mastery of their environment with little more than a hand gesture.

As part of his research into wearable computers, he’s almost ready to field test a “gesture pendant” that will turn a television’s volume up or down, fast forward or rewind a VCR, or turn a lamp on or off.

“The idea is to have more remotes in the home,” says Starner, 31. “One of the problems for an older person is that you can’t see where the [remote] buttons are.”

The pendant, he says, has an infrared camera inside it that will take one gesture — a hand gesturing up, for example — and use it to turn up, or turn on, whatever household appliance the wearer holds it toward. A similar gesture — hand going down — would turn the appliances down, or off.

Similarly, Starner says, he’s working to build a sign-language translator, a computer that might be placed in a cap and look down at a person’s hands to translate what he is signaling into spoken English.

Both ideas sprang from the wearable computer Starner has carried for eight years. The computer even features a display in one of his eyeglass lenses.

“I have an ‘intelligent agent’ that sees the world as I see it, that can pull up information that’s relevant as I need it, just in time,” Starner says.

A computer can “capture the data of someone’s everyday life, then create agents based on that data that might be useful to you,” he says.
Here's a look at research being pursued by this year's other nine assistant professors winning CAREER Awards:

- **Jeffrey Davis**, electrical and computer engineering, is researching whether high-speed communication networks can replace chip-based global and semi-global interconnects. It's research that might significantly reduce the area needed for wires on a chip. He's also developing ways that students in grades five through 12 can learn about microprocessor design.

- **Reginald DesRoches**, civil and environmental engineering, is studying how shape-memory alloys previously used primarily in biomedical and aero applications might make buildings and bridges more resistant to earthquakes. He's developing a “smart materials” interdisciplinary program for students.

- **Faramarz Fekri**, electrical and computer engineering, is researching new and better ways to keep transmissions private and error free, based on wavelet transformation over finite fields.

- **Paul Hasler**, electrical and computer engineering, is developing a new class of computer chips capable of “neural network” learning that could allow them to control manufacturing plants or vehicles.

- **Pinar Keskinocak**, industrial and systems engineering, is studying e-commerce and electronic exchanges, specifically supply chains, the matching of buyers and sellers, dynamic pricing and the development of spot markets. The work will be used to prepare case studies for students.

- **Tim Lieuwen**, aerospace engineering, is studying the fundamental fluid mechanics and chemical kinetics that control acoustic radiation from flames.

- **Frank Loeffler**, civil and environmental engineering, is studying how anaerobic bacteria can clean the environment of chlorinated pollutants such as pesticides and solvents. He is setting up a visiting student-researcher program with the University of Puerto Rico at Mayaguez and summer programs for high school teachers and students.

- **Beth Mynatt**, computing, is studying how well co-workers share calendar information via personal digital appliances, specifically looking at the trade-offs between values such as convenience and privacy.

- **Linda Wills**, electrical and computer engineering, is studying how a better understanding of software and re-engineering techniques lead to low-power, compact imaging devices such as autonomous vehicle vision systems. Her research has applications for heart monitors, crash-avoidance devices in vehicles and autonomous helicopters.
Tech CAREER Award Winners

Georgia Tech’s 13 CAREER Awards in 2001 are the most presented in one year by the National Science Foundation. Tech ranks second among universities with CAREER Award recipients. Here’s a list of the faculty who have received the CAREER Awards during past years.

**2000 (10)**
Hayriye Ayhan, industrial and systems engineering; Robert Dickson, chemistry and biochemistry; Imme Ebert-Uphoff, mechanical engineering; Irfan Essa, computing; Clifford Henderson, chemical engineering; Sven Koenig, computing; Louis Lyon, chemistry and biochemistry; Vincent Mooney, electrical and computer engineering; Emmanouil Tentzeris, electrical and computer engineering; and Min Zhou, mechanical engineering.

**1999 (8)**
Amy Bruckman, computing; Rami Haj-Ali, civil and environmental engineering; Anton Kleywegt, industrial and systems engineering; Kenneth McKenzie, computing; Leonard Schuman, computing; Fotis Sotiropoulos, civil and environmental engineering; Anne Steinemann, architecture; and John (Zhongju) Zhang, chemistry and biochemistry.

**1998 (3)**
Dmitri Mavris, aerospace engineering; Zhong Wang, materials science and engineering; and Guotong Zhou, electrical and computer engineering.

**1997 (12)**
Greg Abowd, computing; Ann Chervenak, computing; Rita Gregory, architecture/civil and environmental engineering; Dennis Grubb, civil and environmental engineering; Rigoberto Hernandez, chemistry and biochemistry; Christopher Lynch, mechanical engineering; Steve McLaughlin, electrical and computer engineering; Dana Randall, computing/math; Suresh Sitaraman, mechanical engineering; Gregory Turk, computing; Sotira Yiakoumi, civil and environmental engineering; and Li You, physics.

**1996 (6)**
Berdinus Bras, mechanical engineering; Subhendu Das, computing; Janet Hampikian, materials science and engineering; Joy Laskar, electrical and computer engineering; Mark Prausnitz, chemical engineering; and Angus Wilkinson, chemistry and biochemistry.

**1995 (7)**
Haskell Beckham, textile and fiber engineering; Abhijit Chatterjee, electrical and computer engineering; David Col- lard, chemistry and biochemistry; Mark Guzdial, computing; Jerry Seitzman, aerospace engineering; Loren Williams, chemistry and biochemistry; and Ellen Zegura, computing.
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Trash Bin Treasure

‘Priceless’ scrapbook of alumnus Charles Seward found in Chattanooga trash container

By Maria M. Lameiras

Mary Charles McDonald thought the old scrapbook owned by her father, Georgia Tech alumnus Charles Seward, was safely tucked away in an old steamer trunk — until she learned it had been found in a trash bin at a Chattanooga car wash. Now the scrapbook bearing the letters of former presidents and other dignitaries sits in the property room at the Chattanooga Police Department until a judge decides whether it belongs to her and her family or to the woman who found it.

Heather Nelson, an employee at the car wash, discovered the leather-bound scrapbook and turned it over to police. It was embossed with the name Charles M. Seward.

“There were letters signed by presidents and senators, and it looked genuinely old,” says Sgt. John Spain, an investigator with the Chattanooga police. Police generated a press release to try and find the owner.

McDonald, who lives in Marietta, Ga., contacted the police, but once she had asserted a claim to the scrapbook, the woman who found it decided she wanted it too, says Ed Buice, media director for the Chattanooga police.

“I guess once she figured out it was worth money, she decided, ‘finders keepers,’” Buice says.

“There are things in there people might look at as valuable, but I look at them as priceless because it belonged to my father,” McDonald says. “This stuff really wouldn’t mean anything to anybody but me.”

Charles Seward, who graduated from Tech in 1923 with a commerce degree, was the grandson of William Seward, secretary of state to Abraham Lincoln. The scrapbook is filled with letters, cards, notes and mementos that chronicle Charles Seward’s professional, political and personal life, including his Georgia Tech transcript. A letter in the scrapbook that holds special significance for McDonald is one her father wrote to Richard Russell, former chairman of the U.S. Senate Armed Services Committee. It was that letter that brought the recovered book to
Chattanooga police officer Ed Buice looks at a postcard of William Seward and Abraham Lincoln found in a scrapbook that includes photos and memorabilia of many famous Americans.

McDonald’s attention through friends.

“My brother, William Henry ‘Bill’ Seward, studied aeronautical engineering at Georgia Tech from 1955 to 1957, then he left to go into Navy flight school in Pensacola. From there he went into the Marine Corps. He was a major in the Marines when he was shot down over Vietnam,” McDonald says.

“The military wanted to declare him dead and, in the letter, my father asks them to keep open the file on my brother. After that, my brother was listed as missing in action.”

Just last year, McDonald and her son, Robert Norman Brown, gave blood samples to try to match their DNA with remains found in Vietnam. The samples matched and last summer Bill Seward’s remains were returned to Georgia and buried at Arlington Cemetery in Sandy Springs.

When the story of the scrapbook surfaced in the media, a woman active in the MIA Association saw an article and word of the discovery made it to McDonald through a mutual acquaintance.

Among the items in the scrapbook are a copy of a letter from Seward to Franklin Delano Roosevelt, then governor of New York, offering support for his presidential campaign, the letter FDR sent in return and a 1968 letter from Richard Nixon thanking Seward for his support of his presidential campaign. In addition, there are postcards McDonald and her brother sent to their father from camp, a copy of McDonald’s high school directory from the year she graduated and the contract for the first house Seward and his wife bought in Atlanta, “things a dad might stick in a scrapbook,” McDonald says.

Now that the car wash employee has hired a lawyer to retain ownership of it, McDonald has hired her own attorney and is waiting for the court system to decide if she gets her father’s scrapbook back.

“The interesting part is that my attorney got a copy of my father’s will, and in the will he left that scrapbook to my son. When my father died in 1970, my son was just a kid in kindergarten, but now he’s a professor at Appalachian State University in Boone, N.C.,” McDonald says. “It was obviously very important to my father if he mentioned it in his will, and it is not something we would have ever given or thrown away. We are a very close-knit family, and we love old things.”

Even once the court case is resolved, however, McDonald will always wonder how the scrapbook ended up among the soda cans and dirty rags in the car wash trash bin instead of inside the steamer trunk of her mother, who died in 1995.

“I lived for a while in Dalton, Ga., and my mother lived there for a while, too. I can only assume that, somewhere between Dalton and Marietta, it must have been lost in a move. It should have been in an old steamer trunk where my mother kept her important treasures.” GT
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- Nov. 8 Nike Elite (ex.)
- Nov. 12 E.A. All-Stars (ex.)
- Nov. 16 Florida A&M (DH w/women)
- Nov. 19 Pennsylvania
- Nov. 28 Wisconsin
- Dec. 16 Syracuse ( Philips Arena)
- Dec. 21 Wofford
- Dec. 23 Tulane
- Dec. 29 IUPUI
- Jan. 2 Cornell
- Jan. 5 Clemson
- Jan. 13 Maryland
- Jan. 22 Virginia
- Jan. 30 Florida State
- Feb. 2 North Carolina
- Feb. 9 Duke
- Feb. 20 NC State
- Feb. 27 Wake Forest

2001-2001 Women’s Home Schedule:

- Nov. 2 Basketball Travelers (ex.)
- Nov. 10 SE Pro-Am (ex.)
- Nov. 16 Kansas State (DH w/men)
- Nov. 23-24 Thanksgiving Tourny
- Nov. 23 UNC Asheville
- Nov. 24 Consolation/Championship
- Dec. 5 Florida State
- Dec. 27 Georgia ( Philips Arena)
- Dec. 30 Duke
- Jan. 10 Virginia
- Jan. 14 Maryland
- Jan. 26 Clemson
- Jan. 29 Charleston Southern
- Feb. 3 Wake Forest
- Feb. 7 NC State
- Feb. 17 North Carolina
- Feb. 23 Morris Brown

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2001 Volleyball

Remaining Home Schedule:

- Oct. 12 vs. Maryland at 7 p.m.
- Oct. 13 vs. Virginia at 7 p.m.
- Oct. 14 vs. Arkansas at 3 p.m.
- Nov. 2 vs. North Carolina at 7 p.m.
- Nov. 3 vs. NC State at 7 p.m.
- Nov. 23 vs. Georgia at 7 p.m.

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By Maria M. Lameiras
Photography by Michael Keza

Robotic fingers grasp food packages and place them in shipping containers, grapefruit whiz by high-speed inspection cameras and an automated visual inspection system examines chicken parts for traces of bone missed during deboning.

It isn’t the production floor of a major food processor, but the research lab of the Food Processing Technology Division at Georgia Tech.

This is where Tech scientists and researchers work daily to develop and test technology to advance the operating capabilities of the food processing industry through two programs, the Agricultural Technology Research Program and Georgia’s Traditional Industries Program for Food Processing, which is managed through the Food Processing Advisory Council (FoodPAC).

“The food processing industry relies heavily on third-party equipment manufacturers to develop and introduce new processing technologies. This tack reduces industry risk, but also limits innovation,” says Craig Wyvill, director of the Food Processing Technology Division, part of GTRI.

“We see this as an opportunity to work more closely with food processors and equipment manufacturers in undertaking some of the higher-risk innovations involving the use of cutting-edge technologies. In doing so, we are employing multidisciplinary teams that include research scientists and engineers from GTRI, academic faculty and students from Tech’s colleges of Engineering and Sciences, as well as working with faculty from the University of Georgia’s College of Agricultural and Environmental Sciences,” Wyvill says.

Founded in 1973, Tech’s ATRP is one of the oldest and largest agricultural technology research and development programs in the nation. Its poultry industry focus is directed at innovations ranging from biosensors to test poultry for salmonella and other harmful bacteria to a portable computer system for screening the risk of worker injury on the job.

Through FoodPAC, the division is adapting some of the same technologies for the bakery and fruit industries.

Interdisciplinary research is essential to the programs. Kok-Meng Lee, a professor in mechanical engineering, is involved in one such project. ATRP is developing a machine for the poultry industry that moves live chickens from a conveyor belt into the process-
ing system. Currently, workers manually hang the chickens by their feet on a shackle line that carries them into the processing plant.

"We've had some different problems on how to develop technology to work with a live product," Wyvill says. Lee, working with poultry scientists from the University of Georgia and GTRI researchers, has created models and formulas based on how the birds respond to machinery during field trials.

George Vachtsevanos and Bonnie Heck in the School of Electrical and Computer Engineering are involved in a FoodPAC project. They are working with GTRI research engineer Wayne Daley to develop an integrated vision and X-ray technology to detect bones in deboned poultry products.

"When bones are removed from meat, current operations rely on line workers to feel for any missed bones or fragments," says Vachtsevanos, adding that end users, such as fast food restaurants, want a safe product, which means no bones or bone fragments. "Some processors have turned to X-ray technology to monitor for missed fragments."

However, the X-ray systems on the market still miss small "fan bones" located on or near the surface of the meat.

The research team is testing a vision-based automatic detection system for bones or defects. The team's goal is to integrate the system with a commercial X-ray-based inspection system to improve its detection rate of bones in deboned poultry.

"We have been working closely with chicken processors like Tyson and Cagle's and we have been receiving parts from them for testing purposes," Vachtsevanos says.

The system is equipped with digital cameras, frame grabbers and computers and use software that produce color images of the chicken parts moving through the inspection system at 60 feet per minute.

"We are achieving 95 percent detection rates and we want to improve that even further," Vachtsevanos says. "The X-ray systems only detect 30 percent of fan bones, whereas a combined system brings that up to 95 to 98 percent."

The project team plans to license and commercialize the hybrid technology in the near future for the poultry industry and for other industries as well.

"The technologies we are developing are all generic and very well applicable to other food processing, such as red meat, vegetables, peanuts, et cetera. We would like, in the future, to bring it to other potential users," Vachtsevanos says.

ATRP is also developing information technology systems for the food industry. Voice-operated wearable
computers have been used in Claxton Poultry's processing plant in Claxton, Ga. The system is used to record data gathered during processing, says Jennifer Stavriotis, hazard analysis critical control point coordinator at the plant.

"The computer data creates less paperwork and allows the plant to be monitored via the computer. The system is fairly easy to use and it ties in directly to the other monitoring we are required to do," Stavriotis says.

Work on wearable computers began at ATRP around 1994.

"We were doing computer-based training modules for various industrial applications and we saw the need to move computer-based training from a classroom experience and incorporate it into a person's job and make it readily available where you do your work," says GTRI research engineer Chris Thompson.

Wearable computers support people doing complex tasks on factory floors, particularly where workers need to have their hands free or who need access to information while doing a task, Thompson says.

"Collecting data is one of the problems industries run into, especially in a hands-free or wet and noisy environment," says Tom McKlin, a research
scientist with GTRI. "One way we've addressed that with the wearable computers is through hardware such as noise-canceling microphones or the speaker-independent, speech-recognition software we use."

Test runs using the wearable computers have also been done at Cagle/Keystone Foods in Camilla, Ga. "I was really amazed that, as clunky as the technology might be, how excited people got in wanting to use it. It was the opposite reaction to what we'd expected," Thompson says.

Bill Leverett, vice president of manufacturing for agricultural equipment maker Durand-Wayland Inc., says his company contacted Tech about three years ago after citrus producers requested a machine to automate the fruit inspection process. "They needed a better way to do the defect sorting. In the fruit industry, there is a shortage of labor and the grading of fruit is the most labor-intensive part of the business. Because they are doing it manually now, another problem is getting everyone to do the same thing the same way," Leverett says. "When you have 25 to 30 people doing the job and you tell them what you want, you still can't get any two of them to agree on the same fruit having the same defects. Consistency is a big problem and we thought that is this was something we could automate, it would solve that problem."

The first-generation prototype developed through FoodPAC is a high-speed, camera-imaging system that could inspect 600 grapefruit per minute on a one-by-one basis using low-cost Universal Serial Bus cameras that photograph the fruit in four quadrants from the top and bottom for a three-dimensional scan. "Achieving these speeds has been a real challenge for our team," says GTRI research engineer and project director Wayne Daley. "But the end result has been a unique and potentially groundbreaking system."

Researchers are developing a prototype that could be ready for field testing within a year, Leverett says. Mrs. Smith's Bakeries has been working through FoodPAC and with Baking Technology Systems — a manufacturer of bakery machinery known as Bake-Tech — to develop similar high-speed scanning technology for baked goods.

"We hope to be able to inspect 1,000 buns a minute with a 360-degree inspection to inspect such aspects as the distribution of seeds on the top of the bun, any defects in the bun and the dusting flour on the bottom of the bun," says S. Clayton Muggridge, IM 82, vice president of manufacturing/frozen operations for Mrs. Smith's, adding that customers such as fast food companies require exacting consistency standards in terms of size, color and appearance. "We now have people who visually inspect the buns, but they can't do a 360-degree inspection, they can just do a general inspection," Muggridge says.
Senior research engineer Wiley Holcombe works on a machine that will move live chickens from a conveyor belt into the processing system, eliminating time-consuming manual labor. Another innovation is a biosensor to test poultry for salmonella.

"We hope the new system will even be able to count the number of seeds on the top of the buns and keep track of gradual color changes that can occur during production. That can be a problem if a person does not recognize the color change until it is too late, but if we have the computer technology there to indicate the change, we can do what we need to fix it before it becomes a problem."

They plan to test a vision inspection system for sandwich buns at Mrs. Smith’s Bakeries’ plant in Villa Rica, Ga., later this year.

In the robotics area, GTRI researchers are focused on developing systems that meet the cost and performance needs of the food industry. "In many cases, commercial robotic offerings have been built on platforms designed for the high-precision demands of the automotive or electronics industries," says Wyvill.

"Speed and affordability are key to a successful food processing robot, not high precision."

The Tech-developed Intelligent Integrated Belt Manipulator has been designed to meet the speed requirements of a typical processing line and employs a single, compact pickup head to transfer products from a conveyor belt to packing boxes.

Tech designers say the next generation of food processing robots will use hand-eye coordination, which humans perform effortlessly, to control a robot’s movements. The units are also able to screen quality during product handling.

To help house its expanding range of research activities, a new, 45,000-square-foot food research center is planned for the North Avenue Research Area in 2002. It will help bring all of the department’s far-flung units together. ATRP and FoodPAC scientists and researchers now are working in labs and offices spread throughout campus. "We are building an interdisciplinary research center that will allow GTRI and academic faculty to work together with synergy under one roof," Wyvill says.

The facility will include office space and laboratories for automation technology, information technology, human factors, food safety, environmental and bio-processing. In addition, the facility will contain electronic interactive exhibits in the lobby and will house a 50-seat auditorium and a conference room for industry seminars, symposiums, workshops and meetings. GT

More on ATRP is available at http://atrp.gatech.edu and more on FoodPAC is available at http://foodpac.gatech.edu.
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Crash Study
Engineers smash airplanes to test airworthiness

By Maria M. Lameiras

Catherine Bigelow is good at piecing things together. Bigelow oversees research on aging aircraft as a manager for the Federal Aviation Administration. She and her engineers and researchers smash airplanes then pick through what remains to detect where problems might occur, what happens when they do and how to make the planes safer.

In her free time, the Vermont native meticulously crafts works of art in stained glass, drawing her own designs and creating delicate masterpieces for family and friends. She has also worked on several large stained glass projects as part of a charity organization that provides windows for churches around the country.

Bigelow, 48, earned her bachelor’s degree in civil engineering from the University of Vermont at Burlington in 1975. She chose to go to graduate school at Georgia Tech for both its reputation and location.

“I wanted to go to a school that everyone would know and I wanted something very different than Vermont and Georgia Tech fit both those categories,” she says.

After earning her master’s in civil engineering in 1977, Bigelow completed her doctoral coursework and, in 1979, took a job with the NASA Langley Research Center in Hampton, Va. In 1984, she earned her PhD in civil engineering and worked for NASA in Hampton for 10 more years.

In 1994, Bigelow joined the FAA. She is now manager of the Airworthiness Assurance Research and Development branch at the William J. Hughes Technical Center with a staff of 33 engineers and an annual budget
of more than $30 million.

"We develop methods and techniques to keep aircraft safe as they get older and mechanisms to detect cracks and analytical measures to predict crack growth to know at what size they will be a danger," she says. "The airlines and independence maintenance facilities do all of the actual inspections and repairs, but the FAA develops the standards they need to follow. Accidents can drive some of our research activities, but we have many ongoing research activities that can be applied."

As a part of crashworthiness testing, FAA researchers suspend entire aircraft from cranes and then drop test them to monitor and measure what happens to the occupants (crash test dummies), seats and overhead bins when there is a crash.

"We do this to determine the response when there is a crash and to see how things can be improved to make sure the occupants can survive and evacuate the plane," Bigelow says.

Bigelow’s department has devised many safety measures now commonplace on commercial airplanes, such as the floor lighting which guides passengers to exits.

Bigelow also has worked to support women and other minorities in the workplace, increasing participation by students and graduates from Hispanic-serving institutes and historically black colleges and universities at the technical center and in her branch’s research activities. She actively mentors her employees in developing their careers and many of her employees, over half of which are minorities, have been recognized for outstanding job performance.

In April, Bigelow was honored with a special “Wonder Woman” award from the Federal Women’s Program at the Hughes Center for her performance and her support of minorities. In 2000, she received the

Pretty Pastime
Imagination, dexterity create stained glass art

While living in Virginia and working as an engineer with NASA, Catherine Bigelow noticed a sign at her local hardware store advertising a class on creating stained glass art.

"I'd always been interested in stained glass, so I took one class, then four or five more, getting more and more advanced. I've been doing it ever since."

Her first projects were "little sun-catcher things to hang in the window — sunsets and green fields," she says.

Then Bigelow started tackling more and more challenging projects — larger window hangings, stained glass boxes and panel lamps she made as gifts for family members.

"My first really involved project was a big, Tiffany-style lamp with roses I made for my mom for Christmas," she says. After that, family members began asking her to make windows for their houses and she created another rose lamp for a brother's wedding gift.

A lot of patterns are available in books, but I have made some of my own patterns," says Bigelow, who once used a photo of a woman's beloved dog to create a pattern for a stained glass piece.

"I like laying out the designs and thinking of the colors and the kinds of glass I need to get the effect I want," she says. "I like the creativity and detail work when I'm cutting out the pieces and getting them to fit all together. I like the manual dexterity it takes."

A NASA colleague was involved with a church group that built churches for areas in need, and some of the members had made a stained glass window for a church. Bigelow joined the group and over the years has helped produce windows for churches in Pennsylvania, New Hampshire, Ohio, Michigan, Wisconsin and New Jersey.
center's Model Work Environment Award of Excellence and the Model Workplace and Diversity Award for the FAA Research and Acquisition Associate Administrator.

At Tech, Bigelow was the first woman to enter the PhD program in structural engineering and, when she went to work for NASA, she was the only woman engineer in her branch.

"I never really noticed it to a great extent. I usually tried to do what I needed to do and not pay much attention to it. In school I was treated differently at first, mostly by professors, but in time they got used to me," she says. "I've seen a lot of changes since then. In the academic arena, there are more females taking these kinds of classes and, here at the technical center and at NASA, I have seen many more women begin working in technical fields."

The oldest of seven children, Bigelow says she started early as an example to other women, namely her four younger sisters. She took her inspiration from the work ethic and belief in education instilled by her parents Donald, a dairy farmer, and Margaret, a teacher.

"My two brothers, Dennis and James, still live in Vermont and work the farm, Royal Terrace Farms, with my father. My four sisters are spread all over the country," Bigelow says. "Donna is a plant pathologist in Tuscon, Ariz., Patricia is a fish biologist at Yellowstone National Park in Wyoming, Margaret is a fish biologist in Washington state near Seattle and Elizabeth is an accountant in Cincinnati.

"We all had to work on the farm and that gave us a good work ethic," she says. "It was never, 'You're a girl, you can't do that.' It was always, 'Get out there and get it done.' I always felt I could do whatever I wanted to do and whatever effort you put into it makes you able to do whatever you try to do." GT
Hurricane Herb
Alumnus Saffir creates world standard for measuring hurricanes' fury

By Maria M. Lameiras

Herb Saffir took a job as assistant county engineer in Dade County, Fla., in 1947 and moved into the path of his first hurricane.

“We moved here in September and that same month we had a bad hurricane that went through Miami and then another in October,” says Saffir, a 1940 Georgia Tech civil engineering graduate.

Although he and his neighbors had some warning, they had no idea what to expect from either storm — how severe they would be or what kind of damage they could do.

The incidents piqued his interest in studying the storms and through his work Saffir co-created the Saffir-Simpson Hurricane Scale, the worldwide standard used to determine the destructive potential of hurricanes and other tropical storms around the world.

“Looking back, I think they were probably category two or three, not particularly severe, but they flooded most of south Florida. For a number of weeks there was standing water all over Miami,” Saffir says.

Before 1960, the only way weather researchers could track hurricanes was through transmissions from ships that radioed in reports of the conditions at sea, he says. That year, the first weather satellite, TIROS I, was launched into space. Nine days later it spotted its first cyclone north of New Zealand.

Saffir realized that if the findings transmitted back from the satellite gave him enough information about a storm, he could estimate how severe it was. The warning would enable people in the path of a hurricane to prepare for the storms and evacuate if necessary.

Saffir developed the scale after conducting a study for the United Nations in 1969 on preventing hurricane and tropical cyclone damage to low-cost housing around the world. He created a formula to calculate how much structural damage winds above 75 mph could do and created a five-stage scale to measure the damage potential of a hurricane. Bob Simpson, who was then the director of the National Hurricane Center in Miami, added probable tidal surge and surge disaster potential to the formula, creating the current scale, used by weathercasters to rate storms.

Since then, Saffir has become a worldwide expert on tropical storm damage and building code development, designing codes and giving talks in communities along the coastal United States and in tropical countries from the Caribbean to Australia.

Saffir came to his life’s calling circuitously. Upon graduation from Tech, he worked as a highway surveyor in Georgia, in a training program for civil engineers for the Tennessee Valley Authority and in Langley Field, Va., on aeronautical research for NASA’s predecessor, the National Advisory Committee for Aeronautics. He served in the Army during World War II and later worked in New York City before moving to Florida.

“Dade County was large and it was really developing then. We in the engineering department were involved in consulting on the building codes that were used. The code was silent on many of the things that could happen in a storm. They didn’t consider things like uplift, the force of the wind on a building that tends to lift the roof up and take it off.”

“Gradually, after storms like Hurricane Donna in 1960, south Florida adopted the first requirements for windows and doors and curtainwalls on the exterior of buildings. I got into that field and made contributions to the building code to make sure new construction would be able to withstand a hurricane,” Saffir says.

After 11 years with Dade County, he opened Saffir Consulting Engineers. He has worked with clients throughout the Gulf Coast, the Southeast and the world, helping strengthen building codes and construction standards for at-risk areas.

Saffir says it is gratifying to see the traces of his life’s work around him.

“Driving around south Florida I can see the engineering work I have done. It’s there in the shape of buildings and bridges. It is there in the fact that the building code we use, and that the state will be using as of next January, has got a lot of the requirements for wind resistance in it that I pushed for very strenuously,” he says. “I think I’ve left a little mark.”

That mark can also be found in the building code and design work Saffir has done in Puerto Rico, Belize, the Bahamas, Bermuda, Barbados, St. Lucia, Hong Kong and Australia, to name a few of the locales where he has worked.

Although many areas in Florida and along the Gulf Coast have learned how to prepare for hurricanes and stricter building codes in place in south Florida are being adopted statewide, Saffir says he sees a dangerous sense of complacency about hurricanes along the Atlantic Coast, which is at risk from Georgia to Maine.

“People have sort of forgotten those bad storms like Hugo and Andrew. It is hard to keep the level of
Herb Saffir, 84, co-inventor of the Saffir-Simpson Hurricane Scale, warns that people along the coast must build for future hurricanes.

interest up when nothing happens," he says. "But the population along the coast has increased tremendously. People all the way from Brownsville, Texas, to the Gulf states to Massachusetts and Maine are susceptible to hurricanes. The waterfront has always been a desirable place to live and people have built expensively there. Those people are in harm's way unless they build to anticipate the hurricanes that will come."

The natural tendency of hurricanes to "decay" or lose strength as they travel north over cooler waters has tempered the fear of hurricane damage in the coastal areas farther north, but the potential for severe damage remains. Although he feels the risk is most severe in Georgia and the Carolinas, there is danger anywhere land touches ocean.

"They don't have as much respect for hurricanes as people in south Florida, and their buildings are not as strong as what we have," Saffir says. "New York City is in a bad position if a hurricane were to strike at a certain angle and at a certain velocity. I think most people along the coast are either complacent or not knowledgeable about what a hurricane can do to them."

Now 84, Saffir continues to be active in his work. He recently served as consulting design engineer for the National Hurricane Center building for the National Weather Service, which earned Saffir a 2000 Presidential Award for Design Excellence. Ironically, the old National Hurricane Center was severely damaged by Hurricane Andrew in 1992 and the new building was designed to withstand sustained winds of 130 miles per hour, with winds gusts up to 169 miles per hour.

Saffir also recently completed work on the design of a three-story steel frame blast fence at Miami International Airport designed to contain the noise and blast velocities emitted by aircraft undergoing tests.

Currently, he is designing windows and skylights for manufacturers preparing for the strengthened building codes going into effect in Florida next year, and making structural investigations of existing buildings.

"I didn't want to sit on the front porch in a rocking chair. I like to travel and I'm interested in my work," he says. GT
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Breaking new ground is not unusual for David Burgess. When Georgia Gov. Roy Barnes appointed him to the Public Service Commission in 1999, he became the first African-American, the first engineer, the first staff employee and the first Georgia Tech alumnus to join the agency.

"I worked at the PSC for 17 years as a staff member before I became a commissioner," Burgess, EE 81, says.

Burgess' career at the PSC has ranged from customer service technician to director of the telecommunications and rates and tariffs divisions.

"Shortly after I graduated from Tech, I was hired as a utilities engineer, and I've been here ever since. I worked in the telecommunications division performing engineering audits at various telephone companies. I would review their rates and tariffs and report my findings to the commissioners."

The PSC is charged with oversight of rates and services of public utilities and transportation.

The governor has high praise for Burgess.

"David has shown a true commitment to the work of the Public Service Commission," Barnes says. "Not only does he provide invaluable working knowledge of this commission based on his work as a staff member, he has tremendous energy and a strong desire to continue to improve our state's regulatory environment."

Burgess was appointed to fill an unexpired 18-month term and elected to the post Nov. 7, 2000.

While appointment to the commission had previously been political, Burgess says he believes he was appointed because he knows the PSC.

"I think Gov. Barnes wanted someone who re-"
ally understands the significance of this agency, because it is having more and more of an impact on the economic prosperity of the state,” Burgess says. “Georgia is becoming a technical mecca. Gov. Barnes is really big about attracting high-tech companies to the state and he understands that the role of the PSC is to make sure that the infrastructure is right.”

Burgess joined two attorneys and two businessmen on the commission that regulates a $12 billion industry. The transportation division oversees truck safety, limousine services, charter buses and towing companies while the utilities division regulates natural gas distributors and marketers, statewide electric providers, rural electric membership co-ops, municipal electric systems, local telephone companies, long-distance providers and competing local telephone providers.

“I think that presents a good blend,” Burgess says. “The commission shouldn’t be five businessmen or five engineers. I think we get an overall perspective when you’ve got a legal sense, a business mind and an engineering mind.”

Burgess credits his Tech education for much of his success. “I still remember that orientation class,” he recalls. “Our leader said, ‘There are 10 of you here now, and by this time next year, eight of you won’t be.’ That’s just as plain as day in my mind. After the first quarter, I thought I would be one of the eight, but I had a good talk with myself and I decided, ‘I can do this.’ That stays with me to this day. If I have to face an unknown, I say, ‘I can do this.’”

Burgess hopes to use his seat on the commission to further promote investment in Georgia’s infrastructure to improve economic prosperity across the state, not just in urban areas.

“We’re seeing a lot of applications come out of the new technology that’s coming here,” he says. “In the area of education and health care, telecommunications technology is making significant improvements. We have high-speed Internet for our schools and libraries — interconnecting schools so you have schools with less of a curriculum sharing with schools that may have more.

“In health care, we see doctors at major medical facilities using telecommunications to help out their counterparts in rural communities as they perform surgery.”

Burgess says that none of this could be done without reliable energy sources — and cites rolling blackouts and other energy-related crises in California.

“We’ve got a planning process to certify Georgia Power’s demand through 2006 and the resources are being constructed to make sure that demand is met,” he says. “That’s how we make a contribution to ensure this big engine keeps on rolling.”

Burgess’ experience in engineering played a part in devising Georgia’s long-term energy plan.

“I was able to make sure that energy companies were making reasonable forecasts for energy management. I was able to determine if the facilities being built matched the growth projected. That takes an engineering mind,” he says.

Burgess hopes that approach will avert any more problems like the natural gas deregulation program last year, when consumers statewide were up in arms about rate hikes of 200 percent or higher.

“Any time you take an industry like Atlanta Gas Light, with 1.5 million customers, that has been a near-monopoly for over 100 years and try to regulate it, there will be problems,” he says.

“The so-called experts said it would take five to seven years for everyone to choose a new marketer. Contrary to that forecast, most consumers made their decision in less than 10 months and the new marketers weren’t ready. They didn’t have billing systems or customer service operations in place. Atlanta Gas Light had trimmed their staff drastically and they weren’t prepared to release 1.5 million customers that quickly.

“At the same time, the commodity price of natural gas went to an all-time high. That timing is what really angered people.

There was a tremendous amount of confusion and everyone blamed deregulation. We didn’t do a very good job of educating the public about what happens in the deregulation process.”

Burgess says he is committed to providing Georgians with the best services possible.

“At the end of the day, there are three questions I ask to measure how well I do my job: Are the rates affordable? Is service provided of high quality? Are the services reliable?

“Over the past 20 years I’ve been able to confidently say that I have done that for the people of Georgia, and I’ve been able to promote a better quality of life for them.”
GEORGIA INSTITUTE OF TECHNOLOGY
DEAN OF ENGINEERING

The Georgia Institute of Technology invites applications and nominations for the position of the Dean of the College of Engineering. The new Dean will lead the Institute’s strongest academic unit and one of the nation’s top-ranked colleges of engineering. Through its nine on-campus schools, its international programs in France and Singapore and the Georgia Tech Regional Engineering Program, the College of Engineering offers undergraduate and graduate degrees in 23 fields spanning traditional disciplinary and emerging multi-disciplinary areas. For the past several years, the College has granted more total degrees in engineering, more degrees to women engineers, and more graduate degrees to African-American engineers than any other college of engineering in the country.

The new Dean must have a strong commitment to education, an outstanding personal record of research, ability to work well with both faculty and other administrators, and a clear understanding of education and R&D policies and how to influence those policies. He or she will be expected to provide strong leadership in development activities for the College and strong support for Georgia Tech’s pre-eminent role in economic development within the State of Georgia as well as nationally and internationally.

The Georgia Institute of Technology is situated on an attractive campus in the heart of Atlanta, a vibrant and diverse city with great economic and cultural strengths. The Institute is a member of the University System of Georgia and the Georgia Research Alliance. The College of Engineering at Georgia Tech is the only public engineering college in the state. For more information, please consult the search web site at: www.coe.gatech.edu/deansearch.

The search is commencing immediately and will continue until the position is filled. It is expected that the new Dean of the College of Engineering will be selected by the winter of 2002. Georgia Tech is being assisted in this search by A. T. Kearney, Inc. Nominations and applications (to include detailed résumé, reference list, and other supporting documentation) should be sent, in confidence and preferably electronically, to the Dean of Engineering Search Committee c/o:

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Active optics for telescopes is the next challenge for NASA engineer Mark Whorton.

By Maria M. Lameiras

Next summer NASA scientist Mark Whorton hopes to watch as part of his life is launched into space.

Whorton, an aerospace engineer at NASA's Marshall Space Flight Center in Huntsville, Ala., leads research in isolating or minimizing vibration that could disturb experiments conducted in the low gravity of Earth’s orbit.

He serves as principal investigator on the "g-LIMIT" project, which uses electromagnetic levitation to isolate highly sensitive experiments conducted aboard the International Space Station. Some of his experiments are scheduled to be launched on the space shuttle for testing on the International Space Station next year.

Currently, Whorton, PhD 97, is spending the 2001-02 academic year at Tennessee State University on a NASA Administrator's Fellowship he was awarded in June.

Whorton, his wife Lee and their daughters Rachel and Anna relocated to Nashville for the duration of his stay at Tennessee State.

Under the fellowship program, NASA employees teach and do research at minority-serving institutions, and faculty at those institutions are allowed to work at Marshall for a year.

Whorton chose Tennessee State because of the research being conducted in active and adaptive optics by the automated astronomy and advanced control systems groups at the university's Center of Excellence in Information Systems.

“I wanted to use my time away from Marshall as an investment to strengthen me in the technical areas I want to branch off into. Active optics is one of those areas,” says Whorton, who has been with NASA since earning his master’s degree in aerospace engineering from the University of Alabama in 1989.

“A hundred years ago, the largest ground-based telescope used a 200-inch mirror. It was commissioned early in the 20th century and it took until the mid-1900s until it became fully on line. For about the last 50 years that was the largest ground-based telescope in the world,” Whorton says. “It was the upper limit of telescope size because the weight of the mirror and the pull of gravity on it would cause the mirror to sag.”

Now technology has caught up with research and large ground-based telescopes use much larger mirrors that are broken up into segments.

“Each segment is individually supported and oriented, so you can effectively create a very large surface without having this monolithic mirror. But you have to monitor and precisely control each segment. That is what is called active optics,” Whorton says.

The Hubble space telescope is 1 meter in diameter, but by using segmented mirrors, a much more powerful telescope could be designed, Whorton says. For example, a 6-meter telescope would have 36 times more power than a 1-meter telescope.

Whorton is also working on adaptive optics, a related research discipline focused on reshaping the mirrors of ground telescopes to simulate the conditions seen by a telescope in space.

“It was not so much the power of the Hubble telescope as the fact that it was above the atmosphere,” Whorton says. “Up there the stars don’t...
twinkle. It is an effect of the atmosphere that makes them twinkle when seen from Earth and that obscures the images. Active optics removes the effect of gravity on the mirror, and adaptive optics changes the shape of the surface of the mirror to remove the effect of the atmosphere and the twinkle of the stars.

"What that gives us is an image that gets us fairly close to what a space telescope can do. By using very large ground-based telescopes with a combination of active and adaptive optics, we hope to get close to approximating what Hubble can do."

Improved ground telescopes would not, however, replace space telescopes. NASA plans for the next space telescope to use active optics.

"Ground-based telescopes complement space telescopes. NASA's interest is that we can develop and field test the technology on the ground in a more cost-effective manner than in space. The key role is for us to proof test these systems before we launch them into space," he says.

After he completes his tenure at Tennessee State, Whorton will spend 12 to 15 months at NASA's Ames Research Center in Moffett Field, Calif., and Dryden Flight Research Center in Edwards, Calif., working on intelligent flight control technology and flight testing.

"Intelligent flight control uses neural network technology to design airplane autopilots that can adapt autonomously. They are called intelligent controllers because the design concept mimics the way biological systems adapt," Whorton says. "The idea is to develop better autopilot systems for aircraft and spacecraft."

His work is the culmination of a lifelong dream. "I think I have always wanted to work in the space program," Whorton says. "I was barely in elementary school, but I can remember the Apollo missions and then the moon walk. I've always enjoyed space."
Candy Man

It's a sweet job directing plants for Hershey Chocolate

By Karen Hill

Douglas Hartman started his career making trucks, then moved to telephone-switching equipment. But any 6-year-old would tell you his last career move was the right one.

Hartman, IE 61, oversees eight plants that churn out millions of Twizzlers, Super Bubble gum pieces and Jolly Ranchers for Hershey Foods Corp. Not a bad gig at all for a father of eight.

“They all like it, but I don’t bring it home as much as they would like,” says Hartman from his Lancaster, Pa., office. “I’m around it all the time and don’t think about it.”

Hartman is one of four manufacturing directors for Hershey Chocolate USA, one of two subsidiaries of Hershey Foods Corp., the nation’s largest confectioner and an exporter to 90 countries.

Hartman is responsible for the non-chocolate candies made by 2,500 workers in eight plants — five in the United States and others in Mexico, Puerto Rico and Canada.

A Baltimore native, Hartman followed friends from his all-boys polytechnic high school to Georgia Tech. After jobs with Mack Trucks and Stromberg-Carlson, he joined YNS Candies in 1967. Ten years later, Hershey bought YNS.

Now, Hartman travels to each plant three to four times a year.

“Each day’s different,” he says. “I oversee the plant managers, helping them with day-to-day issues and the problems they have.”

In many ways, the work is the same as in any manufacturing environment, Hartman says.

“Most of the issues are personnel related; then there are production issues with equipment, managing costs and budgets, developing people to become managers,” he says.

It’s automation, rather than white-aproned candy makers, that makes the factories hum, Hartman says, with strict adherence to recipes.

“Parts of [this work] are very high-tech. The wrapping equipment is state of the art; the cooking process is controlled by microprocessor computers,” he says. “We’re able to do a lot of things today that we couldn’t 15 or 20 years ago because of the revolution in the computer control industry.”

Still, he says, a little magic remains.

“There’s a little candy art. Computers do control things, but the ingredients come off farms so they can vary in consistency. You might think that flour’s flour, but there are many different types of flour, and a given wheat coming off one farm may be slightly different than the wheat that’s coming off another farm,” Hartman says. “Or, you could get a flavoring that doesn’t meet our flavor standards.”

So, is that when Hartman convenes an expert emergency panel of grandmas, elves and Willy Wonka?

Nope, he says. “Food technologists.”

Director Douglas Hartman, IE 61, oversees eight plants that churn out millions of Twizzlers, Super Bubble gum pieces and Jolly Ranchers for Hershey Foods Corp.
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Innovative History

Professor Steve Usselman tracks history and technology

By Neil B. McGahee

Steve Usselman has never had a lot of respect for the sanctity of boundaries, particularly those that separate technology and humanity. That’s pretty heady stuff coming from a history professor at one of the country’s premier technical universities.

“I try to teach people not to pigeonhole themselves into separate worlds of technical and social thought,” he says. “It’s simply wrongheaded. What we’re really after is bridging those worlds and thinking in an integrated way.

“I study engineers as well as teach them and I’ve found they operate in realms in which precision is often very important. You have to respect their skills as problem-solving technicians, but at the same time, if you look at the long-term effectiveness of engineers, the ones who can transcend those technical skills are the ones who make long-term contributions to society. That sometimes leads to tension because some engineers say, ‘I can’t worry about these things.’”

An associate professor and graduate studies coordinator in Georgia Tech’s School of History, Technology and Society, Usselman spends a lot of time trying to convince young engineering students to think 15 years down the road — to consider things that don’t contribute directly to the polishing of their technical skills.

He speaks from experience.

Unable to decide between bioengineering and history while an undergraduate at the University of California-San Diego, Usselman majored in both.

Even after deciding to pursue his graduate degrees at the University of Delaware, he chose industrial and business history and the history of technology as his areas of interest.

Usselman’s preoccupation with history and technology has also extended to his postgraduate research. As an associate professor at the University of North Carolina-Charlotte, he studied the computing industry from the late 1930s through contemporary times. His essay, “IBM and Its Imitators,” won the 1993 Newcomen Prize, awarded for excellence in business history by the Newcomen Society for the Study of the History of Engineering and Technology.

Usselman’s chief interest, however, has been the exploration of the railroad industry from the 1840s to the 1920s and the impact of technology. He has had several essays published in the *Journal of Technology and Culture* and the *Business History Review*, and is completing research for a book, *Regulating Railroad Innovation: Business, Technology and Politics in America, 1840-1920*.

“My overriding interest is to look at how technological innovation has been shaped by the actions of economic and political institutions and the impact of those decisions,” Usselman says.

“When railroads began to emerge in the 1870s, engineers began coming into the industry in droves, creating these extraordinarily refined, efficient machines for moving commodities over long distances. The political institutions responded by trying to regulate them, usually in regards to fares and safety. This regulation usually directed innovation in some areas — which usually benefited railroads — while neglecting other areas, like employee safety.

“What links these two projects is my interest in the relationship between business organizations and politics. I’ve tried to tell the story of railroads and computing in a way that it’s neither a technical nor a political story but establishes parallels between these two industries. I want Tech students to see how genuine innovation occurs — it’s an extremely complex process. I like to think that our students are beginning to appreciate that complexity and break down the boundaries necessary for genuine innovation to succeed.”

Usselman’s innovation in the classroom resulted in his winning the 2000 E. Roe Stamps Excellence in Teaching Award, given annually.

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**Usselman File**

- **Born:** Nov. 21, 1956, in Whittier, Calif.
- **Education:** BA bioengineering and history, University of California-San-Diego, 1979; MA history, University of Delaware, 1981; PhD history, University of Delaware, 1985.
- **Personal:** Wife, Marion Usselman, program officer at Tech’s Center for Education Integrating Science, Mathematics, and Computing; three children: Karen, 15, Laura, 12, and Nathan, 10.
- **Achievements:** Winner of the 1993 Newcomen Award and the 2000 E. Roe Stamps Teaching Award given to outstanding educators in social sciences and humanities on the Tech campus.
- **Leisure interests:** Enjoys family activities, particularly hiking and camping and tennis.
to Tech educators in social sciences and humanities who exhibit sustained creativity in their disciplines.  

"Steve is, quite simply, a good educator who is dedicated to the enterprise of being a scholar," Greg Noble, a faculty colleague in the School of History, Technology and Society, says. "He brings innovation to the job."

For example, Noble points out, Usselman co-teaches a history of technology with Tim Lenoir's class at Stanford University using a live, real-time Internet connection — a first at either school. It allows the students not only to communicate verbally but to also see each other and develop an electronic connection between the universities.

"He also instituted a team teaching partnership with Professor Russ Callen in the electrical engineering department," Noble adds. "The course, entitled The Engineer in Society, offers a historian and an engineer talking about the role of engineers in daily life."

"I used to tell people that I never wanted to team teach," Usselman says, laughing. "I had this sort of controlling interest. "Now, I hardly want to do anything other than team teach because I find it so exciting to have multiple voices in the classroom," he admits. "It turns learning into more of a common investigation rather than information that is just distributed. I think that is a major lesson for Georgia Tech students to take with them into settings where answers aren't definitive — in fact are often very messy — and work in team situations interactively towards solving the problem. It's like the real world."

Usselman says that students should look to IBM as an example of a real-world business that innovated more successfully by creating an organization of teams where the boundaries don't become too rigid.

"We can't become captive to our own expertise," he says. "Expertise by its nature tends to be conservative. The trick is to take our expertise but keep it engaged with innovation — a world of possibilities."
Historic Elm

This graceful American elm is one of Georgia Tech's oldest trees. It was already branching out as a mature tree when Tech opened its doors in 1888. Growing next to the Alumni/Faculty House, the elm's branches stretch across Basil Garden, site of many alumni events. Tech horticulturist Donna Chronic says special care is taken to ensure the health of the tree, such as frequent watering in times of drought and not using chemicals on surrounding plants.

Tree experts say the historic elm is between 130 and 150 years old and is nearing the end of its life cycle. But don't count it out. This great elm — one of the few on campus — is a survivor of the Dutch elm disease that has swept across the country. GT
Dorothy L. Hagerty and P. Frank Hagerty of Atlanta

- Natives of Easton, Pennsylvania, who have lived in Atlanta since 1975
- Frank Hagerty has a B.S. and M.S. in chemical engineering from Massachusetts Institute of Technology and a Ph.D. in chemical engineering from Yale University. He worked with Eastman Kodak and spent most of his career in Process Development with Sun Company in Marcus Hook, Pennsylvania. As a professor, he taught chemical engineering at the University of Pennsylvania. Before retiring in 1989, Frank Hagerty was a consultant for many years.
- Dorothy “Duff” Hagerty, a graduate of Swarthmore College, worked with IBM for 32 years in several managerial positions.

Gifts to Georgia Tech:

- Frank Hagerty has donated over 2,000 books to the Gilbert Library.
- The P. Frank Hagerty Charitable Remainder Annuity Trust will establish an endowment for the purchase of books, journals, and information resources in the fields of mathematics, physics, chemistry and engineering for the Library and Information Center.

Frank Hagerty’s Notable Quotation:

“The friendliness of the Georgia Tech Library staff and particularly admittance to the stacks has been especially helpful to me. After retirement, I became interested in fields outside my academic training: mathematics, such as cohomology and differential geometry as applied to physics. Browsing the stacks and the new books kept me interested in many other scientific subjects. Since I have appreciated working in Georgia Tech’s library, I want to contribute to its future success.”

Dorothy and Frank Hagerty are two of Founders’ Council’s 726 members who have made bequests or life income gifts in support of Georgia Tech’s future.

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