Contact Information

Throughout his 24-year career at Georgia Tech, ECE Regents’ Professor Ajeet Rohatgi has pushed the frontiers of photovoltaic cell performance and cost through research into the effects of impurities in silicon solar cells, the design and modeling of solar cells, and the development of new fabrication techniques that simultaneously speed manufacturing and reduce costs. He is the director of the University Center for Excellence in Photovoltaics Research and Education and the founder of Suniva, a start-up company based at Technology Park in Norcross. The company celebrated its official grand opening in December 2008.
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For additional information on any articles in this report, please visit www.ece.gatech.edu/media.
ECE Facts at a Glance

The School of Electrical and Computer Engineering at the Georgia Institute of Technology is located in the heart of Atlanta, one of the fastest growing and most diverse markets for high-tech development in the United States. In addition to being the largest producer of electrical engineers and computer engineers in the nation, ECE is a leader in many different areas of research and education and in the Institute’s commercialization activities. The following statistics detail the size and scope of the School’s operations and represent the Atlanta campus, Georgia Tech-Savannah, Georgia Tech-Lorraine, the Georgia Tech-Shanghai Initiative, and the ATLANTIS M.S. dual degree program with Politecnico di Torino in Italy and the Technical University of Munich in Germany.

Faculty/Staff

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>115</td>
<td>Number of faculty (tenure-track)</td>
</tr>
<tr>
<td>5</td>
<td>Joint appointments</td>
</tr>
<tr>
<td>23</td>
<td>Professors Emeriti</td>
</tr>
<tr>
<td>32</td>
<td>Funded professorships</td>
</tr>
<tr>
<td>8</td>
<td>Georgia Research Alliance Eminent Scholars</td>
</tr>
<tr>
<td>5</td>
<td>National Academy of Engineering members</td>
</tr>
<tr>
<td>38</td>
<td>IEEE Fellows</td>
</tr>
<tr>
<td>6</td>
<td>Presidential Early Career Award in Science and Engineering recipients</td>
</tr>
<tr>
<td>2</td>
<td>Academic professionals</td>
</tr>
<tr>
<td>4</td>
<td>Senior academic professionals</td>
</tr>
<tr>
<td>2</td>
<td>Lecturers</td>
</tr>
<tr>
<td>81</td>
<td>Research faculty</td>
</tr>
<tr>
<td>98</td>
<td>Administrative staff</td>
</tr>
</tbody>
</table>

Students

Undergraduate Students (Fall Semester 2008)

- 801 Electrical engineering
- 396 Computer engineering
- **1,197 Total**

Graduate Students (Fall Semester 2008)

- 609 Doctoral*
- 2 Special
- 485 Master’s*
- **1,096 Total**

Degrees Awarded (Summer 2008 through Spring 2009)

- 53 B.S.Cmp.E.
- 3 B.S.Cmp.E.-Georgia Tech-Savannah
- 195 B.S.E.E.
- 17 B.S.E.E.-Georgia Tech-Savannah
- 339 M.S./M.S.E.E.
- 2 M.S./M.S.E.E.-Georgia Tech-Savannah
- 1 M.S. Bioengineering
- 91 Ph.D.
- 1 Ph.D. Georgia Tech-Savannah
- 3 Ph.D. Bioengineering
- **705 Total**

Intellectual Products

- 21/84 Patents/records of invention
- 4 Advanced Technology Development Center start-up companies
- 9 ATDC graduate companies

* Totals include enrollment in interdisciplinary degree programs in bioengineering and robotics.

Research

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$56,013,526</strong></td>
<td>Total funds received on external grants, contracts, and gifts during FY 09.</td>
</tr>
<tr>
<td><strong>$214,270,031</strong></td>
<td>Total dollar amount for all proposals submitted (389)</td>
</tr>
</tbody>
</table>

**$50,121,812** Sponsored research awards alone acquired by ECE faculty and its associated research centers for FY 09.

- 29% College of Engineering Awards
- 21% Resident Instruction Awards
- 18% All Georgia Tech Awards, excluding the Georgia Tech Research Institute
- 10.5% All Georgia Tech Awards, including GTRI

ECE FY 09 State Budget and Expenditures

<table>
<thead>
<tr>
<th>State</th>
<th>Sponsored*</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Initial FY 09 allocation $19,145,000)</td>
<td></td>
</tr>
<tr>
<td>Salaries and Fringe</td>
<td>$24,946,169.35</td>
</tr>
<tr>
<td>Travel</td>
<td>$184,778.28</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>$1,433,832.20</td>
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<tr>
<td>Equipment</td>
<td>$428,609.94</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$26,993,389.77</td>
</tr>
</tbody>
</table>

**Research Consortium**

- Salaries and Fringe: $1,069,576.63
- Travel: $98,299.56
- Materials and Supplies: $843,527.50
- Equipment: $209,774.68
- Subtotal: $2,220,678.37

**Departmental Sales and Services**

- Salaries and Fringe: $226,913.04
- Travel: $69,325.77
- Materials and Supplies: $227,692.90
- Equipment: $9,413.00
- Subtotal: $533,444.71

**Total** $82,939,359.90

* Includes Georgia Tech Foundation and agency funds
The Year in ECE

“It was the best of times, it was the worst of times” – Charles Dickens’ opening to A Tale of Two Cities – is an apt descriptor for the last fiscal year at the School of Electrical and Computer Engineering at Georgia Tech. It was the worst of times because of the difficult economic climate. Despite the gloomy economy, however, ECE did not just survive – we continued to thrive.

While two ECE academic programs maintained their number six rankings and another its number seven rating in U.S. News & World Report, our undergraduate electrical engineering program advanced into the elite top five for the first time. Alumnus Eric Boe reached for the stars as the pilot for the STS-126 mission to the International Space Station. In January 2010, alumnus Pedro Ray will assume the presidency of IEEE. ECE faculty members made marks on the national stage, with Rob Butera serving as a Jefferson Science Fellow in the U.S. State Department, Ajeet Rohatgi receiving a U.S. Environmental Protection Agency Climate Protection Award, and Maysam Ghovanloo being honored by former president George W. Bush at the annual iftaar dinner at the White House.

Our faculty brought in more than $56 million in research awards during FY 09, funding programs such as RF-DNA authentication technologies and evaluation and enhancement of sensors for detecting buried land mines. Suniva, a 2009 graduate company of the Advanced Technology Development Center, opened for business in December 2008 as the first solar power company in the southeast U.S. Innovolt and VQLink, companies founded by Deepak Divan and Nikil Jayant, graduated from ATDC and VentureLab, respectively.

We granted 705 degrees last year, keeping ECE as the largest producer of electrical engineers and computer engineers in the U.S. Almost 2,300 students were enrolled at our Atlanta campus, at our programs at four locations around the world, and via our online master’s and video program. Our faculty also introduced several innovative educational initiatives. The Vertically Integrated Projects program teams undergraduate researchers with graduate students and faculty on projects that will be deployed and used in the real world. The course “Introduction to the Microelectronics and Nanotechnology Revolution” focuses on how these technologies impact not only ECE and interdisciplinary fields, but our civilization and society as a whole. From the ECE senior design experience sprung the prototype for a product that allows users to measure and compare day-to-day physical and caloric activity.

Our faculty members continued to be high achievers. Justin Romberg became the sixth ECE faculty member to receive a Presidential Early Career Award for Scientists and Engineers, and Ayanna Howard became our third faculty member to receive the Dr. Janice A. Lumpkin Outstanding Educator of the Year Award from the National Society of Black Engineers. Allen Tannenbaum and Ian Ferguson attained Fellow status from IEEE and SPIE, and several faculty received specialized awards from various professional societies.

The recognition of and service by our students are also great sources of pride. For the fourth consecutive year, our chapter of Eta Kappa Nu received a national Outstanding Chapter Award, and the student chapter of IEEE hosted a very successful Region 3 Southeastern Conference. A robotics team from Georgia Tech-Savannah won a design award at an international competition hosted by the Marine Advanced Technology Education Center, and our students also supported K-12 and general community outreach efforts involving the Atlanta Day Center for Women and Children, GIVE Center West, and the annual State of Georgia FIRST LEGO® League Challenge.

In April 2009, Georgia Tech welcomed its eleventh president, G.P. “Bud” Peterson, and subsequently launched a strategic planning initiative to envision what Georgia Tech will be in 2035. I am confident that ECE will continue to play a key role in the Institute’s future success. I invite our corporate and government partners, alumni, and friends to join us in our ongoing mission to make Georgia Tech the best technological university in the world.

Gary S. May
Steve W. Chaddick School Chair
ECE Goes to Washington

Solar energy pioneer Ajeet Rohatgi was recognized by the U.S. Environmental Protection Agency and the American Solar Energy Society for his lifetime contributions to making solar technology a realistic, low-cost energy solution.

The EPA honored Dr. Rohatgi as an Individual Climate Protection Award Winner in a ceremony held on April 21 at the Kennedy Center in Washington D.C. In addition, ASES selected him as the Hoyt Clarke Hottel Award Winner, for contributions in solar energy technology, and honored him at the SOLAR 2009 conference, in Buffalo, N.Y. in May 2009.

Throughout his 24-year career at Georgia Tech, Dr. Rohatgi has pushed the frontiers of photovoltaic energy technology, and honored him at the SOLAR 2009 conference, in Buffalo, N.Y. in May 2009.

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ECE Associate Professor Robert J. Butera, Jr. was chosen last summer by the U.S. State Department as one of seven Jefferson Science Fellows for 2008-09. Dr. Butera was the first Georgia Tech professor selected for this program, and he was based in Washington, D.C. through August 2009.

Built on the premise that science, technology, and engineering programs are integral to the foundations of modern society, the fellowship fosters partnerships between tenured scientists and engineers from U.S. academic institutions and offices within the State Department and USAID. Dr. Butera was chosen for his expertise in the fields of neuroengineering, physiological modeling, and real-time instrumentation.

While on this fellowship, Dr. Butera worked within the Office of Chemical and Biological Weapons Threat Reduction in the Bureau of International Security and Nonproliferation. His work focused on biosecurity policy, with a specific emphasis on dual-use issues in biological research for both peaceful and military applications.

Air Force Col. Eric Boe (MSEE ’97) was among the seven astronauts—including three Georgia Tech alumni—on the space shuttle crew for Endeavour’s STS-126 mission. The shuttle lifted off from NASA’s Kennedy Space Center on November 14 and arrived at the International Space Station (ISS) two days later, where the crew started on their “extreme home improvement” assignments.

Col. Boe, the pilot for the 16-day mission, was joined by his fellow Tech alumni, Shane Kimbrough (MSOR ’98) and Sandra Magnus (PhD CerE ’96). Space shuttle Endeavour’s STS-126 flight featured important repair work and prepared the ISS to house six crew members for long-duration missions. Four spacewalks primarily focused on servicing the station’s two Solar Alpha Rotary Joints, which allow its solar arrays to track the sun.

During the STS-126 mission, Col. Boe was responsible for orbiter systems operations and shuttle robotic arm operations, and he aided Endeavour Commander Christopher Ferguson in the rendezvous and docking with the ISS. Endeavour and its crew landed at Edwards Air Force Base in California on November 30, completing a 16-day journey of more than 6.6 million miles.

Col. Boe is based at NASA Johnson Space Center in Houston, Tex. He grew up in Atlanta, attended Henderson High School in DeKalb County, and holds a bachelor’s degree in astronautical engineering from the U.S. Air Force Academy.

Our Alumni Are on the Move!

Sporting a Georgia Tech ECE polo shirt, Col. Eric Boe tends to his duties as pilot for the STS-126 mission.
honoring distinguished Muslim Americans during the holy month of Ramadan.

According to the results of a recently completed clinical trial, the Tongue Drive System can be operated by individuals with high-level spinal cord injuries. At the annual conference of the Rehabilitation Engineering and Assistive Technology Society of North America on June 26, Dr. Ghovanloo and his team reported the results of the first five clinical trial subjects to use the Tongue Drive System. The trial was conducted at the Shepherd Center, an Atlanta-based catastrophic care hospital, and funded by the National Science Foundation and the Christopher and Dana Reeve Foundation.

Justin K. Romberg is the sixth ECE faculty member to receive the Presidential Early Career Award for Scientists and Engineers, the nation’s highest honor for professionals who are just starting their scientific research careers.

Dr. Romberg was among 100 recipients of this award, who were named by President Barack Obama on July 9. The honorees will receive their awards this fall at a White House ceremony.

Established in 1996, PECASE honors the most promising researchers in the nation within their fields. Awarded an Office of Naval Research Young Investigator Award last summer, Dr. Romberg was nominated for the PECASE award by the U.S. Department of Defense. He was one of 27 investigators selected for the ONR Young Investigator Awards last year from a group of more than 200 applicants. Funding for his ONR award will support his project, “Compressive Sampling for Next-Generation Data Acquisition.”

Dr. Romberg’s research focuses on the mathematics of data acquisition. In particular, he is interested in ways in which randomness can actually help in data acquisition, potentially reducing both the cost and the computational complexity of high-resolution sensing systems. This work will influence the design of next-generation analog-to-digital converters, radar imaging platforms, and MRI systems.

Previous ECE PECASE winners include Elliot Moore, Ali Adibi, David V. Anderson, David S. Citrin and Steven W. McLaughlin.

Bo Hong received an NSF CAREER Award for his project entitled “Adaptive Concurrency Management for Multicore Computing.” Dr. Hong is the second ECE faculty member at Georgia Tech-Savannah to receive this prestigious honor.

Results from Dr. Hong’s research are expected to significantly improve the performance of multicore computing and expand the range of applications that can benefit from such processor platforms. This work is expected to facilitate efficient multicore processing for computationally demanding applications in science, engineering, and business.

Jon Jenkins (BEE ‘87, MSEE ‘88, PhD (EE) ‘92) is the lead for the data analysis group for the NASA Kepler Mission, which launched on March 6 to search for habitable planets in the Milky Way for the next three-and-a-half years. He is based at NASA Ames Research Center in Moffett Field, Calif.

After graduating with his Ph.D. in 1992, Dr. Jenkins went to Ames to work for the SETI Institute in Mountain View, Calif. and began work with an international group of astronomers. In May of that year, he joined the Kepler team. The Kepler spacecraft will watch a patch of space for indications of Earth-sized planets moving around stars similar to the sun. The area that Kepler will watch contains about 100,000 stars like the sun. Using special detectors similar to those used in digital cameras, Kepler will look for a slight dimming in the stars as planets pass between the stars and Kepler. The observatory’s place in space (outside of Earth’s orbit) will allow it to watch the same stars constantly throughout its mission, something observatories such as NASA’s Hubble Space Telescope cannot do.

Ayanna Howard received the 2009 Dr. Janice A. Lumpkin Educator of the Year Award at the 12th Annual Golden Torch Awards. This ceremony and awards program, sponsored by the National Society of Black Engineers, took place at the NSBE Annual National Convention on March 28 in Las Vegas.

The Golden Torch Awards Program honors individuals, companies, and institutions that have produced a consistent body of highly distinguished work, served as role models for others, and advanced opportunities for African-Americans within the engineering industry. Dr. Howard was chosen for the 2009 Dr. Janice A. Lumpkin Educator of the Year Award because of her significant contributions to engineering education and outreach and for her research activities in robotics.

Allen Tannenbaum was named an IEEE Fellow “for contributions to robust control and computer vision.” A member of the ECE faculty since 1999, he is involved in the areas of computer vision, image processing, computer graphics, control theory, cryptography, and biomedical imaging. Dr. Tannenbaum is the Julian Hightower Professor and holds a faculty appointment in the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University.

Ian T. Ferguson was elected as a SPIE Fellow “for his pioneering contributions to the development of III-V materials and devices for solid state lighting, detectors, and solar cell applications.” Dr. Ferguson has held many conference leadership roles with SPIE and the Materials Research Society and is the founder of the International Conference in Solid State Lighting.

Pedro Ray (BEE ‘82, MSEE ‘83) was selected as the 2009 IEEE president-elect and will begin serving as IEEE president on January 1, 2010. He will succeed 2009 IEEE President John Vig, a consultant with System Planning Corporation.

Mr. Ray is president of Ray Engineers, a professional services corporation with over 90 employees. The company is located in Old San Juan, Puerto Rico. He is also owner and president of various corporations dedicated to the development of commercial and residential real estate projects.

In 2000, he was Chief Examiner in charge of revision to the Puerto Rico Electricity Pricing Structure, and was named Puerto Rico’s Electrical Engineer of the Year. Prior to becoming IEEE president-elect, Mr. Ray had served the organization in many capacities, most recently at the board level since 1999 and as a board member for six years. He also served as treasurer for IEEE in 2003 and 2004.
A delegation of Korean government, education, and corporate representatives joined Georgia Tech faculty and Georgia representatives at the ribbon-cutting ceremony.

A team of faculty led by ECE Assistant Professor Jongman Kim has formed a historic partnership with the Korean government, industry, and universities to develop a single platform for all multimedia functions. This award marks the first time that the Korean government has chosen a U.S. university to lead one of its R&D programs.

Awarded a $9 million contract through the 2008 KORUS Tech Program, Georgia Tech will lead the development and design of the next generation of digital convergence devices that will let users establish and participate in digitally connected communities. Project investigators will develop immersive technologies on a hybrid GPU-CPU platform, which will be created at the newly established KORUS Research Center for Informersive Systems.

The Georgia Electronic Design Center, Georgia Research Alliance, Georgia Department of Economic Development, and Microsoft Research joined forces to focus on RF-DNA, a novel technology for RFID.

Under the alliance, Microsoft Research is investing $600,000 over two years. New RFID technologies allow tiny circuits, sometimes printed on paper, to enable secure sharing of product information and other data via wireless networks at low cost. This new collaborative RF-DNA research project will enable the creation of hard-to-forge certificates of authenticity by exploring the randomness of simple objects in the RF electromagnetic domain. Advances in this area of research could have a significant and positive impact on the pharmaceutical and banking industries.

Georgia Tech dedicated the Marcus Nanotechnology Building on April 24. The 190,000-square-foot complex poises the Institute as a global hub for nanotechnology R&D, while igniting an environment that could potentially transform both local and state economies.

The building, coupled with current nanotechnology research facilities at the Microelectronics Research Center, creates an unparalleled complex for the development of nanotechnology enhanced by world-class researchers, faculty, and students. Research and activities to take place at the Nanotechnology Research Center will affect everyday life, from health care advances to green energy development.

The $90 million facility was made possible in part by a grant from philanthropist Bernie Marcus, founder and chairman of the Marcus Foundation, who made a $15 million commitment to the project.

Recent research into the properties of graphene nanoribbons provides two new reasons for using the material as interconnects in future computer chips. In widths as narrow as 16 nanometers, graphene has a current carrying capacity approximately 1,000 times greater than copper—while providing improved thermal conductivity.

The current-carrying and heat-transfer measurements were reported by a research team, led by Raghunath Murali from the Georgia Tech Nanotechnology Research Center. The same group previously reported measurements of resistivity in graphene that suggest the material’s conductance would outperform that of copper in future generations of nanometer-scale interconnects.
It’s All about Teamwork

A 13-member robotics team from Georgia Tech-Savannah received a design award during the Marine Advanced Technology Education Center’s 2009 International Student Remotely Operated Vehicle Competition. The Georgia Tech team was among more than 20 collegiate finalists competing in the challenge to design and build ROVs that function as submarine rescue systems.

The MATE competition, a first for Georgia Tech-Savannah, was held at the Massachusetts Maritime Academy. The Savannah team received the design elegance award and was commended for the design aesthetics, simplicity, and functionality of their ROV. The team captain was Justin Shapiro, an interdisciplinary Ph.D. robotics student, and ECE Assistant Professor Fumin Zhang served as the group’s faculty advisor.

The Georgia Tech Solar Jackets successfully converted a 2001 Audi TT from a gas-powered sports car to a solar-assisted electric vehicle that has the same capabilities as a standard production car.

With an array of lightweight solar cells mounted on the vehicle’s roof and hood, the car runs on a combination of batteries and solar power and has a functioning four-wheel drive. The array also provides 12 volts of power to support the car’s power windows, radio, brakes, power steering, and all lights.

A 120-volt battery pack powers the Audi engine, giving it a 70-mile range between charges. The Solar Jackets plan to add a lithium ion battery system to the car that will increase the travel range to 140 miles. Conversion of the Audi began in 2008, and the group finished the car’s conversion in time to participate in the 2009 Georgia Careers in Transportation Expo. In the future, they plan to race in the 2010 North American Solar Challenge, as well as the 2011 World Solar Challenge in Australia. EE undergraduate Francesco Zimbardi serves as president of Solar Jackets.

Georgia Tech was selected as one of 17 North American teams by the U.S. Department of Energy, General Motors, and Natural Resources Canada to participate in EcoCAR: The NeXt Challenge, a collegiate vehicle engineering competition that began during fall 2008.

During this three-year program, students will reengineer a 2009 Saturn VUE to achieve improved fuel economy and reduced greenhouse gas emissions, while retaining the vehicle’s performance and consumer appeal. In this first year, teams developed their vehicle designs using GM’s Global Vehicle Development Process. Students will explore a variety of cutting-edge clean vehicle solutions, including full-function electric, range-extended electric, hybrid, plug-in hybrid, and fuel cell technologies. In June 2009, a year-end competition was held in Toronto, Ontario, Canada to measure the teams’ progress. The Georgia Tech team took home two technical prizes from the event.

The interdisciplinary and multifaceted nature of this project involves students from ECE, mechanical engi-

Ten companies have joined with Georgia Tech to establish the Georgia Tech 100G Optical Networking Consortium, believed to be the first academic-industrial consortium of its kind in the world. More than $2.2 million in support has been designated by the consortium’s founding research members: ADVA Optical Networking, Ciena, OFS, and Verizon – and by supporting members Avanex, IBM, Narda Microwave East, Nistica, Picometrix, and RSoft Design Group.

Led by ECE Professors Stephen E. Ralph and Gee-Kung Chang, the consortium allows academic and industry personnel to perform multidisciplinary research in all aspects of 100 Gbps transmission. Research topics range from fundamental studies of 100G optical transmission to assessment of optical and electronic technologies that will be used in such high-speed optical networks.

ECE Professor Waymond R. Scott, Jr. and Gregg Larson, a senior research engineer in the George W. Woodruff School of Mechanical Engineering, have built a test facility to evaluate and enhance sensors designed to detect buried land mines. The unique automated system measures the response of individual electromagnetic induction sensors or arrays of sensors against land mines buried at many possible angles.

Electromagnetic induction sensors work by sending out magnetic fields and detecting responses from electric currents generated when the field interacts with a metallic target. While simple versions of these sensors can detect most land mines, advanced sensors are required to tell the difference between a land mine and harmless buried metal objects like bottle tops or spent bullets.

The researchers are writing functions defined in the Vector, Signal, and Image Processing Library. Studies show that VSIPL functions operate 20 to 350 times faster on a GPU than a central processing unit, depending on the function and size of the data set. GPUs, typically contained in today’s video gaming computers and consoles, are very efficient at manipulating and displaying computer graphics. The highly parallel structure also makes them more efficient than general-purpose CPUs for complex calculations important to defense applications.

continued | page 8
A group of Georgia Tech students, led by EE senior Garrett Langley, has crafted a device that allows individuals to constantly compute the amount of calories they burn—even as they sleep.

Dubbed HappyHR, the instrument is a personal monitor that allows users to measure and compare day-to-day physical and caloric activity. The name is a reference to the euphoric feeling that follows an intense round of exercise—the “happy hour.” The small, rectangular-shaped instrument straps to the wrist or ankle, gathering data related to heart rate and exercise. The information is then transferred via Bluetooth to a PC, where the statistics can be analyzed through Web-based software.

Although the device focuses on calorie counting, Mr. Langley envisions more thorough health applications—including respiratory and glucose monitoring—for this tool that began as a senior design project. An aspiring entrepreneur, it provided an organic way for Mr. Langley to develop a business.

Fellow EE student John Hamilton, biomedical engineering students Stephen Mann and Nathan Kumar, and industrial design student Stuart Lawder all contributed their expertise to actualizing Mr. Langley’s concept. ECE Advisory Board Chair Steve W. Chaddick served as a technical design and business mentor for the team.

On January 31, 48 student teams gathered at the Georgia Tech Student Center to compete in the State of Georgia FIRST LEGO® League Tournament. The event is coordinated by the ECE Student-Faculty Committee, WECE, and the Center for Education Integrating Science, Mathematics, and Computing.

To make it to the state competition, 220 Georgia teams, comprised of more than 1,600 students, competed in one of nine qualifier tournaments during the fall months of 2008, narrowing the field of competitors for the January event. This year’s Challenge theme was “Climate Connections," which gave students, ages 9 to 14, a chance to build and program LEGO® MINDSTORMS robots that help implement different solutions to prevent climate change and that promote responsible stewardship of the environment. Students tackled tasks like managing carbon dioxide emissions, insulating homes properly, using electricity wisely and efficiently, and monitoring wildlife and natural surroundings for changes potentially related to climate issues.

This year’s winning team was The Yottabytes, a home-schooled team from Summerville, Ga. They advanced to the FIRST LEGO® League Worldwide Festival held on April 16-17 at the Georgia World Congress Center and the Georgia Dome.

The VIP eStadium team consists of Edward Coyle (l) and students from ECE and computer science.

### Distributed Workforce

Design and test multimedia systems, web-based applications, and human-computer interfaces to support distributed design and research teams. Partners: Georgia Tech in Atlanta, Georgia Tech-Savannah, and Purdue University.

### eDemocracy Team

Design and create devices, systems, processes, and policies for both secure, authenticated voting procedures and citizen participation in government. EPICS Partner: The Carter Center.

### eStadium Team

Design and deploy wireless and sensor networks to gather and deliver game and venue information for fans and safety personnel during home football games at Bobby Dodd Stadium. Partner: GT Athletic Association.

### Knowledge Mining Team

Design, test, and use systems to enhance student learning in Tech courses through video and data mining, artificial intelligence, machine learning, and human-computer interfaces. EPICS Partner: DSP students.

The VIP program is part of the Arbutus Center for the Integration of Research and Education, which develops new approaches and technologies to improve education and collaboration.

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**Teamwork...**

**EcoCAR: The NeXt Challenge | from page 7**

engineering, civil and environmental engineering, and chemical and biomolecular engineering, as well as students from the Ivan Allen College of Liberal Arts and the Colleges of Management and Sciences. ECE faculty member David Taylor and ECE Ph.D. student Carlos Cubero-ponce serve as advisor and group leader for the controls and LV electrical team; EE undergraduate Samuel Coogan leads the computer-aided design/computer-aided engineering team.

On January 31, 48 student teams gathered at the Georgia Tech Student Center to compete in the State of Georgia FIRST LEGO® League Tournament. The event is coordinated by the ECE Student-Faculty Committee, WECE, and the Center for Education Integrating Science, Mathematics, and Computing.

To make it to the state competition, 220 Georgia teams, comprised of more than 1,600 students, competed in one of nine qualifier tournaments during the fall months of 2008, narrowing the field of competitors for the January event. This year’s Challenge theme was “Climate Connections," which gave students, ages 9 to 14, a chance to build and program LEGO® MINDSTORMS robots that help implement different solutions to prevent climate change and that promote responsible stewardship of the environment. Students tackled tasks like managing carbon dioxide emissions, insulating homes properly, using electricity wisely and efficiently, and monitoring wildlife and natural surroundings for changes potentially related to climate issues.

This year’s winning team was The Yottabytes, a home-schooled team from Summerville, Ga. They advanced to the FIRST LEGO® League Worldwide Festival held on April 16-17 at the Georgia World Congress Center and the Georgia Dome.

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**Arbutus Center for the Integration of Research and Education: Vertically Integrated Projects Program**

Coordinated by ECE Professor Edward J. Coyle, the Vertically Integrated Projects Program assembles teams of sophomores through seniors who work closely with graduate students and faculty on R&D projects that will be deployed and used in the real world. As seniors graduate, new sophomores are added and returning students move up in responsibility.

Students can participate on a team for up to six semesters, earning up to two credits per semester. VIP courses are available in both ECE and computer science. Teams are multidisciplinary and typically have 10 to 15 members. Students gain in-depth knowledge of the technology covered by the team and learn how to contribute to and lead large projects.

The VIP Program supports Engineering Projects in Community Service (EPICS). In EPICS, the VIP teams design, build, and deploy real systems to solve engineering-based problems for local community groups. A mutually beneficial experience, students learn about professional ethics, customer relations, and the impact of engineering. In turn, agencies gain access to technology and expertise that would normally be too costly.

With its official kickoff during January 2009, VIP launched four teams, which continually seek new student participants. Teams include:

- **Distributed Workforce**–Design and test multimedia systems, web-based applications, and human-computer interfaces to support distributed design and research teams. Partners: Georgia Tech in Atlanta, Georgia Tech-Savannah, and Purdue University.
- **eDemocracy Team**–Design and create devices, systems, processes, and policies for both secure, authenticated voting procedures and citizen participation in government. EPICS Partner: The Carter Center.
- **eStadium Team**–Design and deploy wireless and sensor networks to gather and deliver game and venue information for fans and safety personnel during home football games at Bobby Dodd Stadium. Partner: GT Athletic Association.
- **Knowledge Mining Team**–Design, test, and use systems to enhance student learning in Tech courses through video and data mining, artificial intelligence, machine learning, and human-computer interfaces. EPICS Partner: DSP students.

The VIP program is part of the Arbutus Center for the Integration of Research and Education, which develops new approaches and technologies to improve education and collaboration.
IEEE is the world’s leading professional association for the advancement of technology. Chaired by Vivek Kumar in 2008-09, the Georgia Tech student branch of IEEE provides students with ways to enhance their technical skills and professional development, as well as to build a sense of community among its members and ECE students.

Throughout the year, IEEE connected students with faculty and industry professionals. The group hosted 16 corporate presentations, one technical development workshop, and nine faculty presentations. The IEEE student branch also co-hosted the Region 3 SoutheastCon annual conference that was attended by over 40 different schools from the southeast and hundreds of professionals.

Student Organizations

The ECE Student-Faculty Committee promotes increased interactions and better relations among the School’s students and faculty. Duncan Osborn and Gabriel Rincon-Móra were the student chair and faculty chair, respectively, during 2008-09.

During this past year, the ECE SFC co-sponsored Family Weekend in late September, giving parents a chance to visit ECE facilities and to meet faculty and administrators. Throughout the year, this group and the Undergraduate Professional Communications Program coordinated production for ecevis—a wetsite consisting of art, music, and written pieces—and hosted a launch party for the publication during the ECE Fair.

The largest undertaking for the ECE SFC is the planning and coordination of the annual State of Georgia FIRST LEGO® League Challenge, which was held on January 31, 2009 at the Georgia Tech Student Center (see related article, p. 8).

Women in Electrical and Computer Engineering aims to increase awareness of opportunities for women in ECE and to help women reach their full potential as engineers and leaders. Nicole Rennalls served as the organization’s president during 2008-09.

In the last year, WECE hosted ECE lab tours for students from Duluth, Jonesboro, and South Gwinnett High Schools and co-sponsored the 2008 State of Georgia FIRST LEGO® League Challenge. The group also started a service project that assists people served by the Atlanta Day Center for Women and Children by teaching a computer education course. They also organized academic development workshops specific to ECE, study and work abroad programs, professional development activities, and information sessions by National Instruments and Norfolk Southern. WECE also hosted its annual Halloween party, bowling night, and pool party—which attracted a wide cross-section of faculty, staff, and undergraduate and graduate students—along with a barbecue for freshmen and a luncheon for transfer students.

Eta Kappa Nu is the honor society for electrical and computer engineers. Led by Mitch Costley and Rohan Verma during 2008-09, HKN led both academic and community service-oriented activities. The group held its regular Bridge to Business meetings and hosted information sessions about applying to graduate school in engineering and M.B.A. programs, applying for fellowships, and learning about the Ph.D. preliminary exam.

For the fourth year in a row, the Beta Mu chapter of Eta Kappa Nu was named as a recipient of the Outstanding Chapter Award. A significant mark of distinction, this award recognizes a chapter’s service to their fellow students, their department, their university, and the surrounding community during 2007-08.

In the 75 years of the Outstanding Chapter Award’s history, no more than six chapters have won the award four years in a row, putting the Beta Mu chapter of HKN in a very distinguished group of past recipients.

The group hosted the annual ECE Spring Picnic, where the 2009 Richard M. Bass/Eta Kappa Nu Outstanding Teacher Awards were presented to Ali Adibi and D. Scott Wills. HKN volunteers tutored high school students who attend GIVE Center West and assisted metro area boy scouts in earning their electronics merit badges.

HKN continued with its highly successful “chip project,” where members packaged and sold lab supplies at discounted prices, saving students over $25,000, while putting earnings into the chip project scholarship fund. About 80 percent of enrolled lab students buy these kits, which are 60 percent less than the price charged by local bookstores. Income from the chip sales supports a scholarship given to a deserving ECE junior. The scholarship recipient for 2008-09 was Thomas Jay Oatts, who was awarded $500, credited to his tuition.

Eta Kappa Nu officers gather before their annual banquet to induct new members and officers.

2008-09 WECE officers and advisors get together before taking high school students on a tour.

Women in Electrical and Computer Engineering

2008-09 WECE officers and advisors get together before taking high school students on a tour.
Suniva Shines Spotlight on Solar Energy

Founded on technology invented by the Georgia Tech University Center of Excellence for Photovoltaic Research and Education, Suniva develops, manufactures, and delivers its ARTisun series of high-efficiency silicon solar cells for clean, earth-friendly power generation. ECE Regents’ Professor Ajeet Rohatgi, the company’s founder and CTO, is dedicated to driving down the cost per watt of solar generated energy.

In October 2008, Suniva completed the installation of its first manufacturing line and began production of its first-generation solar cells, marking one of the fastest production ramp-ups to date in solar manufacturing. A ribbon-cutting ceremony in December 2008 commemorated the official grand opening of the company, located at Technology Park in Norcross, Ga., and was attended by top economic development officials and Georgia Governor Sonny Perdue. In the last fiscal year, Suniva signed long-term customer agreements with Solon AG and Titan Energy Systems, both leading international solar energy products manufacturers, and completed a $75 million Series C financing, led by private equity firm Warburg Pincus.

The first company of its kind in Georgia and the southeastern U.S., Suniva now employs 100 people and produces enough solar cells to power 10,000 homes, with plans to triple that capacity. On March 23, Dr. Rohatgi joined a delegation of clean technology entrepreneurs at the White House in support of U.S. President Barack Obama’s announcement to increase R&D funding to build and expand America’s clean tech economy. On April 21, Dr. Rohatgi was recognized by the U.S. Environmental Protection Agency for his lifetime contributions to making solar technology a realistic, low-cost energy solution. He was honored with an Individual Climate Protection Award at the Kennedy Center in Washington D.C.

In the last year, Dr. Rohatgi has received numerous accolades and honors for his lifelong achievements in solar power and for the establishment of Suniva.

October 2008 – Power Finance & Risk Magazine’s Five Most Influential People in Renewable Energy
February 2009 – AlwaysOn GoingGreen East 50 Award, which lists the top 50 emerging companies in the eastern U.S. and Canada that are creating new business opportunities in green technology
March 2009 – Suniva named to the Technology Association of Georgia’s “Top 40 Most Innovative Companies” and TAG’s “Top 10 Companies Most Likely To Create Jobs”
April 2009 – Atlanta Business Chronicle’s Envention Award at the 2009 Environmental Awards. This honor is given to a new product developed by an Atlanta company or individual who exhibits outstanding environmental or green benefits.
May 2009 – 2009 Hoyt Clarke Hottel Award Winner, given by the American Solar Energy Society, for contributions to solar energy technology, at the SOLAR 2009 conference, in Buffalo, N.Y.

ATDC ECE Graduate Companies

ASPI Digital (acquired by Polycom, 2001)
Co-Founders: Thomas P. Barnwell, Russell M. Mersereau, and Ronald W. Schafer
CardioMEMS
Co-Founder and CTO: Mark G. Allen
EGT
CSO: Nikil Jayant
Innovolt*
Chair, CTO, and Co-Founder: Deepak Divan
Lancope
Founder: John A. Copeland
Nexidia
Co-Founder and Board Member: Mark A. Clements
Quellan
CTO, Founder, and Board Member: Joy Laskar
RF Solutions (now the WiFi Division for Anadigics)
Co-Founder and Former CSO: Joy Laskar
Suniva*
Founder and CTO: Ajeet Rohatgi

ATDC ECE Start-Up Companies

Asankya Networks*
Co-Founder and CTO: Raghupathy Sivakumar
GTronix*
Co-Founder, CSO, and Board Member: Paul E. Hasler
Qubral* 
Co-Founder and CTO: Farrokh Ayazi
VQLink*
Co-Founder and Interim CEO: Nikil Jayant

* Companies are also graduates of VentureLab
Education

During 2008-09, both active and retired ECE faculty members offered **34 professional education courses** and **three conferences** through the Georgia Tech Professional Education Office to a total number of 1,181 attendees (578 for conferences and 603 for courses). Below is a listing of dates, titles, and ECE-based instructors. All courses were taught at the Georgia Tech campus in Atlanta unless indicated otherwise. Three ECE-sponsored conferences and four online courses are included.

### 2008

- **Near-Field Antenna Measurements and Microwave Holography**
  - June 16-20 | Boulder, Colo. | Edward B. Joy

- **Fundamentals of Engineering**
  - Online Course
  - July 1, 2008-June 30, 2009 | W. Russell Callen, Jr.

- **Fundamentals of Radar Signal Processing**
  - July 21-24 | Las Vegas, Nev. | Mark A. Richards

- **Principles of Modern Radar**
  - July 21-25 | Las Vegas, Nev. | Mark A. Richards

- **Synthetic Aperture Radar Image Formation Processing**
  - August 18-21 | Las Vegas, Nev. | Christopher F. Barnes

- **Fundamentals of Engineering**
  - September 3-October 20 | W. Russell Callen, Jr.

- **Antenna Engineering**
  - September 15-19 | Boulder, Colo. | Edward B. Joy

- **Fundamentals of Synthetic Aperture Radar Signal Processing**
  - September 22-26 | Mark A. Richards

- **Power Distribution System Grounding and Transients**
  - September 23-25 | A.P. Sakis Meliopoulos, George Cokkinides

- **Principles of Continuous Wave Radar**
  - September 23-26 | Mark A. Richards

- **Interconnect Focus Center for Gigascale Integration - 2008 Annual Review**
  - October 1-2 | Faculty Director: Paul Kohl
  - Administrator: Leslie O’Neill, Microelectronics Research Center

- **Fundamentals of Radar Signal Processing**
  - October 13-17 | Mark A. Richards

- **Power System Relaying: Theory and Application**
  - October 20-23 | A.P. Sakis Meliopoulos, George Cokkinides

- **DSP for Practicing Engineers – Online Course**
  - October 27, 2008-February 8, 2009 | Douglas B. Williams

- **Principles of Modern Radar**
  - November 3-7 | Mark A. Richards

- **Far-Field, Anechoic Chamber, Compact, and Near-Field Antenna Measurements**
  - November 10-14 | Edward B. Joy

- **Modern Energy Management Systems**
  - November 18-20 | A.P. Sakis Meliopoulos

- **Signal Processing Refresher**
  - December 2-4 | Mark A. Richards

### 2009

- **Fundamentals of Engineering**
  - February 4-March 23 | W. Russell Callen, Jr.

- **Electrical Engineering: Preparation for the P.E. Exam, Power Option**
  - February 14-March 14 | W. Russell Callen, Jr.

- **Space-Time Adaptive Processing: Application to Radar**
  - February 17-20 | Mark A. Richards

- **Principles of Pulse-Doppler Radar**
  - February 24-26 | Mark A. Richards

- **Fixed-Point Signal Processing Systems**
  - March 2-5 | David V. Anderson

- **Principles of Modern Radar**
  - March 2-6 | Denver, Colo. | Mark A. Richards

- **Image and Video Processing Using TI DM6437 – Online Course**
  - March 2-June 8 | Ghassan Al-Regib

- **DSP for Practicing Engineers – Online Course**
  - March 9-June 15 | Douglas B. Williams

- **Electrical Engineering: Preparation for the P.E. Exam, Power Option – Online Course**
  - March 14-December 31 | W. Russell Callen, Jr.

- **Integrated Grounding System Design and Testing**
  - March 24-27 | A.P. Sakis Meliopoulos, George Cokkinides

- **Near-Field Antenna Measurements and Microwave Holography**

### New Course Introduces Students to the Microelectronics, Nanotechnology Revolution

**COE 3002 – Introduction to the Microelectronics and Nanotechnology Revolution** was offered for the first time in fall 2008 by Ken Byers Professor John D. Cressler. Part of the new College of Management/College of Engineering Technology and Management Program, it also has been offered as a Georgia Tech Honors Program seminar.

This course focuses on how microelectronics and nanotechnology impact all areas of ECE, a broad array of interdisciplinary fields, and civilization as a whole. Unique aspects of COE 3002 are biweekly discussions on a current hot topic relating to class material, widget deconstructions so that students learn how things work, team debates that probe the societal impact of the technology, team projects focusing on widget deconstructions, and field trips to labs where they see development of technology and devices firsthand.

The invention of the transistor has enabled exciting, life-changing devices and services, especially the Internet, which only continues to grow and become more pervasive. The course challenges students to think about how civilization will change, what are the limits of micro/nanotechnologies, where does this path lead humanity, and what are the implications for ECE. Rather than waiting until the sophomore or junior year for exposure to these fields and questions, COE 3002 introduces ECE to all majors, most especially to freshmen and sophomores. The ultimate goals for the course are to capture some of the best students at Georgia Tech, get different majors to interact with each other early in their careers, start addressing the implications and impact of engineering and science applications, and begin instilling a big picture mentality in students.
The ECE Development Office cultivates and coordinates the School’s development and fundraising efforts with industry, alumni, and other interested individuals and organizations, including the College of Engineering and the Institute’s Central Development Office. This office also manages the School’s Corporate Affiliates Partnership Program and plans twice-yearly ECE Advisory Board meetings and the annual James R. Carreker Distinguished Lecture.

The College of Engineering held its annual alumni awards induction ceremony on November 7, 2008. Seven ECE alumni were inducted into the Academy of Distinguished Engineering Alumni, which recognizes alumni for contributions to their profession and to the Institute, and for their active involvement in engineering, management, and the community.

Anthony Alvarez BSEE ’78, MSEE ’79 President and CEO, Leads Technology, Inc. Sunnyvale, Calif.
Todd Cutter BSEE ’79 Senior Director, EEsOf EDA Division Agilent Technologies Alpharetta, Ga.
Sheldon Fox BSEE ’81, MSEE ’82 President, National Programs, Government Communications Systems, Harris Corporation Melbourne, Fla.

(i-r) ECE award winners Gene Sapp, Todd Cutter, Mike Rosen, and Sheldon Fox.

ECE Advisory Board

An outside perspective is essential to maintaining the relevancy of the School’s programs to its alumni and corporate constituencies. The ECE Advisory Board, composed of 22 representatives, provides feedback in these areas during its formal, biannual meetings and throughout the year. During FY 09, the ECE Advisory Board welcomed two new members.

Mat Hans (PhD ’98) leads a new commercialization team in Motorola’s Corporate Research Center in Schaumburg, Ill. The role of this team includes identifying customer R&D projects linked to the Center’s research initiatives, and managing their execution with customers and external partners. Before this business development and customer-facing role, Dr. Hans spent 10 years as a researcher at Motorola and Hewlett-Packard Laboratories. While at HP, he was the resident researcher and program manager at Georgia Tech in Atlanta from 2000-04.

Leslie Sibert (BEE ’85) is the vice president for transmission at Georgia Power, a subsidiary of Southern Company, where she is responsible for the company’s transmission system, including its planning, maintenance, operations, and new construction. Ms. Sibert started with Georgia Power as a co-op student in 1982 and has since held various positions at both Georgia Power and Southern Company. During her tenure at Georgia Power, she has been personally involved with numerous civic organizations and with many activities at Georgia Tech.

C. Dean Alford
Allied Utility Network
Conyers, Ga.
Antonio R. Alvarez
Leads Technology, Inc.
San Jose, Calif.
Michael B. Bartlett
Texas Instruments, Inc. (Retired)
Richardson, Tex.
Michael Buckler
TekMark Global Solutions
Cary, N.C.
Steve W. Chadick
Chair, ECE Advisory Board
Ridgewood Advisors, LLC
Atlanta, Ga.
Mel Coker
AT&T
Atlanta, Ga.
H. Allen Ecker
Cisco Service Provider Video Technology Group
Lawrenceville, Ga.
Mat Hans
Motorola, Inc.
Schaumburg, Ill.
Holmes J. Hawkins, III
King & Spalding
Atlanta, Ga.
Kelvin C. Hawkins, Sr.
IBM
Research Triangle Park, N.C.
Sherra E. Kerns
Olin College
Needham, Mass.
Fred Kitson
Motorola, Inc.
Schaumburg, Ill.
Scott Madigan
SureBill
Duluth, Ga.
Theresa Maldonado
Texas A&M University
College Station, Tex.
Michael R. McQuade
DuPont Company
Wilmington, Del.

E. Jock Ochiltree
Davidson Realty, Inc.
St. Augustine, Fla.
Joseph Parks
Intel Corporation
Beaverton, Ore.
Randall E. Poliner
Antares Capital
Melbourne, Fla.
Thomas J. Quigley
Broadcom Corporation
Franklin, N.C.
Leslie Sibert
Georgia Power
Atlanta, Ga.
Ronald S. Slaymaker
Texas Instruments, Inc.
Dallas, Tex.
Alek Szlam
Szlam Enterprises, Inc.
Alpharetta, Ga.

After many years of dedicated service to ECE and Georgia Tech, Michael Coleman (BEE ’82) and Leonard Haynes (BEE ’72) of the Southern Company stepped down from the Board prior to the fall 2008 semester, and Scott Madigan (BEE ’79) of SureBill stepped down from the ECE Advisory Board at the end of the spring 2009 semester. The School appreciates all of their contributions.

2008-09 Advisory Board

Eugene Sapp BSEE ’59 President, CEO, and Co-Chairman (Retired), SCI Systems, Inc.
Huntsville, Ala.
ECE students attend at least one—and usually several—classes in the Van Leer Building. In addition, required and elective courses are offered in the facility for computer engineers, people who have helped to make Harris a national and global leader in the communications and information technology sectors. The high quality of Georgia Tech’s ECE program and its graduates provide a continuing source of innovation and new technology and product development for our company.”

The Jay H. Schlag Fellowship
Pierce Cantrell received his B.S., M.S., and Ph.D. degrees, all in electrical engineering, from Georgia Tech in 1970, 1971, and 1981, respectively. Since 1981, his career has been at Texas A&M University, where he serves as a faculty member in the Department of ECE and is currently the vice president and associate provost for information technology. In addition to his role as chief information officer for Texas A&M, he serves in this capacity for the entire Texas A&M University System. His wife, Carol, has also had a long career at Texas A&M, where she currently serves as the senior associate vice president for research.

In 2008, Pierce and Carol contacted Georgia Tech to establish a fellowship in honor of Pierce’s Ph.D. advisor, Jay H. Schlag. Pierce was first introduced to Dr. Schlag in an undergraduate controls class. “Jay’s knowledge of the subject, connection to real world engineering, and infectious enthusiasm made for an incredible course.” Following another graduate level course, Dr. Schlag became Pierce’s Ph.D. advisor, providing outstanding mentoring, and designing and building much of the computer interfacing equipment needed to collect research data.

In addition to subject matter expertise and exemplary teaching skills, Pierce feels that Dr. Schlag possesses integrity, character, and a love of family that had a profound effect upon him. Perhaps the best testament of his influence is that Pierce has patterned his own teaching philosophy and style after that of his mentor and friend. “Jay can never be replaced, but his contributions and impact on me and my career will always be a part of who I am, and hopefully a part of my students.” Pierce stated that, since graduating from Tech, it had been very important to him to be able to acknowledge in some way the faculty member who had such a far-reaching impact on his career and his life. How better to acknowledge such a person than with something that will help students.

Pierce and Carol hope that future generations of ECE graduate students will carry on this legacy as recipients of the Jay H. Schlag Fellowship.

There are many reasons and many ways to give to Georgia Tech and ECE. Some celebrate a personal or professional milestone or pay tribute to family members, friends, or former Tech classmates and professors. Some gifts go toward the construction of first-rate facilities and accompanying infrastructure and equipment that will allow Georgia Tech and ECE to remain current with the changing nature of technology and society. Regardless of type, these gifts will benefit the Institute and the School far into the future, leaving a lasting legacy.

Harris Corporation Makes $2 Million Lead Gift to ECE
During this economic recession of historic proportions, securing corporate support for Georgia Tech’s ongoing goals is more important than ever. A recent $2 million lead gift from the Harris Corporation to the School of ECE will provide significant momentum for the School’s long-term vitality.

The Harris gift will support the restoration and renewal of ECE’s headquarters presence on campus, a project that entails construction of a new building for the School prior to the renovation of the Van Leer ECE Building. Specifically, the gift is designated for auditorium space in the new building for ECE instruction, as well as special events for the entire Georgia Tech community.

As the nation’s largest producer of electrical and computer engineers, ECE is in dire need of a modern, state-of-the-art facility. Each year, close to 2,400 ECE students attend at least one—and usually several—classes in the Van Leer Building. In addition, required and elective courses are offered in the facility for students in the other eight disciplines in the College of Engineering, bringing close to 7,000 the number of engineering students receiving instruction there. Countless other students come through the facility for special events and on their way to other campus locations.

“In its current state, the Van Leer Building fails to reflect the stature of the ECE school and the reputation of the Institute,” said Gary S. May, Steve W. Chaddick School Chair of ECE. The Van Leer Building was completed in 1962 and honors the legacy of Col. Blake R. Van Leer, Georgia Tech’s fifth president and the first engineer to head the Institute. “Van Leer is long overdue for an update. Its classrooms pale in comparison to those in newer campus buildings, and the building also lacks adequate laboratory facilities. Our faculty and students are currently scattered across ten buildings around campus. Clearly, this generous gift from the Harris Corporation will go a long way toward creating a new ECE presence that will serve us well in the twenty-first century.”

Based in Melbourne, Florida, the Harris Corporation is an international communications and information technology company serving government and commercial markets worldwide. Founded in 1895, the company has approximately $5 billion of annual revenue and 15,000 employees—including nearly 7,000 engineers and scientists. The company’s business segments include RF communications, government communications systems, and broadcast communications.

“We are very pleased to provide support for the School of Electrical and Computer Engineering at Georgia Tech,” said Harris Corporation CEO Howard L. Lance. “Georgia Tech graduates are among our most talented electrical and computer engineers, people who have helped to make Harris a national and global leader in the communications and information technology sectors. The high quality of Georgia Tech’s ECE program and its graduates provide a continuing source of innovation and new technology and product development for our company.”

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Pierce and Carol hope that future generations of ECE graduate students will carry on this legacy as recipients of the Jay H. Schlag Fellowship.
Capital Campaign

Georgia Tech constantly strives to remain among the highest-ranked engineering institutions in the nation, and ECE endeavors to stay among the top programs of its kind. The Institute is now in the quiet phase of a capital campaign known as the Campaign for Georgia Tech. Several ECE alumni are serving on the Institute Steering Committee, including Rodney C. Adkins (BEE ’81); Warren Batt (BEE ’61); Brook Byers (BEE ’68); and Ken Byers, Jr. (BEE ’68).

While the Campaign for Georgia Tech has $1 billion as its goal, ECE reached its original target of $60 million and now has $75 million as its goal. ECE Advisory Board Member Randy Poliner (BEE ’77), a partner with Antares Capital Corporation, chairs a fundraising steering committee for the School. The committee is comprised of the following alumni:

- Robert Dixon (BEE ’77), Chief Technology Officer PepsiCo
- John Lanza (BEE ’87, MSEE ’88), Chair, Intellectual Property Group Mindspeed Technologies
- Raouf Halim (MSEE ’85), CEO Mindspeed Technologies
- Jesús Léon (EE ’74), Chief Development Officer (retired) CIENA Corporation
- Slim Souissi (MSEE ’92, PhD ’94), Chief Technology Officer Novatel Wireless

The committee has hosted several ECE campaign events this past fiscal year. The first was held last September in Boston in conjunction with a Georgia Tech football game against Boston College. A November event was held in New York City with the College of Management at 30 Rockefeller Center on the set of Saturday Night Live, where a full house learned more about how Georgia Tech is bridging the gap between engineering and management.

In addition to the $75 million goal for the Capital Campaign, the Van Leer Renewal Project is at the top of the ECE fundraising goals list and is now the number one priority for the Institute (see related article, p. 13). Please direct any inquiries regarding how you can support ECE and Georgia Tech to Gary S. May, Steve W. Chaddick School Chair, at gary.may@ece.gatech.edu or 404.894.2902, or to Mr. Poliner at rpoliner@antarescapital or 321.777.4884.

ECE Goal = $75M

$16M Endowment
$14M Restricted
$4.5M Student Support
- Undergraduate Scholarships $500k
- Graduate Fellowships $4M
$6.0M Faculty Support
- Chairs $3M (2 at $1.5M each)
- Professorships $2.25M (3 at $750k each)
- General Faculty Support $750k
$3.5M Program Enrichment
- Undergraduate Scholarships $2.5M
- Graduate Fellowships $2.5M
- Chairs $500k
- Professorships $3.75M
- General Faculty Support $10.75M
- Faculty Research Support $22M
$2.0M General Program Support
- Undergraduate Scholarships $2.5M
- Graduate Fellowships $2.5M
- Chairs $500k
- Professorships $3.75M
- General Faculty Support $10.75M
- Faculty Research Support $22M
$2M Unrestricted School
$15M Equipment
- Undergraduate Scholarships $12.5M
- Graduate Fellowships $2.5M
- Chairs $500k
- Professorships $3.75M
- General Faculty Support $10.75M
$44M Current Operations
$42M Restricted
- Undergraduate Scholarships $42M
- Graduate Fellowships $42M
- Chairs $15M
- Professorships $4.5M
- General Faculty Support $16M
- Faculty Research Support $14M
- Undergraduate Scholarships $4.5M
- Graduate Fellowships $14M
- Chairs $15M
- Professorships $4.5M
- General Faculty Support $16M
- Faculty Research Support $14M
- Undergraduate Scholarships $4.5M
- Graduate Fellowships $14M
- Chairs $15M
- Professorships $4.5M
- General Faculty Support $16M
- Faculty Research Support $14M
$2M Unrestricted

Grants and Gifts

Despite the difficult economic climate of the last year, corporations, non-profit organizations, and individual donors enthusiastically and generously supported ECE and its research, educational, and service missions by contributing $10,618,001 through the Georgia Tech Foundation. The first table shows the amount of funds designated for specific uses. The second table alphabetically lists the various companies, groups, and individuals that donated funds to ECE in FY 09.

Some corporate donors represented in this table are members of the new ECE Corporate Affiliates Partnership Program. A multi-level support structure, CAP helps to create relationships conducive to enhanced and accelerated technology and knowledge transfer between academia and industry. To learn more about membership options, visit the Alumni and External Relations section of the ECE web site.

<table>
<thead>
<tr>
<th>Gift Category</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endowed Student Support</td>
<td>$72,928.00</td>
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<tr>
<td>Endowed Program Enrichment</td>
<td>$1,000.00</td>
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<tr>
<td>Unrestricted to the College/School</td>
<td>$96,682.45</td>
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<td>Facilities Construction and Renovation</td>
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<tr>
<td>Equipment and Instrumentation</td>
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<tr>
<td>Student Support</td>
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<td>Faculty Support</td>
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<td>Program Enrichment</td>
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<td>Van Leer Renewal Fund</td>
<td>$2,000,250.00</td>
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Grand Total: $10,618,000.95

Companies
- ABB, Inc.
- ADVANCE Optical Networking
- AeroVodFrx Corporation
- Agilent Technologies, Inc.
- Alpha & Omega Semiconductor, Inc.
- Altera Corporation
- Analog Devices Semiconductor
- AREVA NP, Inc.
- AT&T Corporation
- BAE SYSTEMS
- BC Hydro
- BIORASIS, Inc.
- Boeing Company
- Brigham and Women’s Hospital
- Broadcom Corporation
- Chevron
- Cooper Power Systems
- CTCA@Southwestern Regional Medical Center
- Dakota Supply Group
- Dow Chemical Company
- Duke Energy Company
- Eaton Corporation
- EFACEC Power Transformers, Inc.
- Electric Power Research Institute
- EMS Technologies, Inc.
- EngeniousMicro, LLC
- Entest, Inc.
- Exelon Corporation
- ExxonMobil Corporation
- FirstEnergy Corporation

The committee has twice hosted ECE campaign events this past fiscal year. The second table alphabetically lists the various companies, groups, and individuals that donated funds to ECE in FY 09.
Foundations/Non-Profit Organizations

Agilent Technologies Foundation
AT&T Foundation
Burns & McDonnell Foundation
Caterpillar Foundation
CHIH Foundation
Community Foundation for Greater Atlanta
Wallace H. Coulter Foundation
Duke Energy Foundation
Eaton Charitable Fund
Fidelity Investment Charitable Gift Fund
Harris Foundation
Intel Foundation
Jewish Federation of Greater Atlanta
John and Mary Franklin Foundation, Inc.
Otto & Jenny Krauss Charitable Fdn. Trust
Norfolk Southern Foundation
Procter & Gamble Fund
Will and Jada Smith Family Foundation
Texas Instruments Foundation
The Carlos & Marguerite Mason Fund
The Greater Cincinnati Foundation
The Harris Foundation
The Quigley Family Foundation

Individuals

Mark G. Allen
Antonio R. Alvarez
Mike B. Bartlett
Warren L. Batts
Harry L. Beck
Teresa Beck
Sue Ann Bidstrup Allen
Margaret H. Boehme
D.E. Bond
Barbara E. Boyd-Vann
Suzy Briggs
Anita Wathen Brownlee
Bruce C. Brownlee
Robert J. Butera
William R. Callen, Jr.
Carol Cantrell
Pierce E. Cantrell, Jr.

Steve W. Chaddick
Samuel Chih
Christopher R. Clark
Mark A. Clements
Mel Coker
Thomas R. Collins
Leyla S. Conrad
William B. Crane
Donald D. Davis, Jr.
R. Thomas Dyal
H. Allen Ecker
Thomas A. Edwards
Janice L. Gaylord
Thomas K. Gaylord
Fred N. Green, III
Holmes J. Hawkins, III, Esq.
Kelvin C. Hawkins
Mary Elizabeth
Hollingsworth
T. Joy Holloway
Eric J. Ingram
Jonathan C. James
Douglas A. Kinney
Kyle L. Klatica
Jan Kolnik
Alan F. Krauss
Frederick G. Krauss
John D. Lanza
Joy Laskar
Betty Lee
Elizabeth Logan
Judith Lorier
Kenneth E. MacKenzie
Scott N. Madigan
Theresa A. Maldonado
Joe E. Mayes
Lea A. McLees
Norma Jean McLees
Michael R. McQuade
Michael McQuary
Ben R. McRee
Frederica Z. Meindl
James D. Meindl
Richard O. O’Bryant

Douglas W. Olsen
Joseph W. Parks, Jr.
John B. Peatman
Randall E. Poliner
Tina G. Prestridge
Thomas J. Quigley
Marc Reed
Robert E. Reed, III
Marvin O. Richter
Joyce C. Sayle
William E. Sayle, II
(Hposthumous)
Harris T. Schneiderman
Mary Ann Sheey
Paul Sheehy
Paul G. Steffes
James A. Stratigos, Jr.
Janie Stratigos
Christopher J. Summers
C. Meade Sutterfield
Katherine Suzman-Schwarz
Aleksander Szlam
Halina Szlam
Jennifer P. Tatham
Kathryn R. Thomas
Michael T. Tuley
Theresa P. Tuley
Kristin S. Turgeon
Judith Vanderboom
Harry L. Vann
Dennis J. Wathen
Patrick W. Wathen
Sabine E. Wathen
Patricia T. Webb
Roger P. Webb
Nathaniel Weil

Steve W. Chaddick School Chair Gary S. May and his wife, LeShelle, visited with Boston area alumni at a Meet the Chair event hosted by Choate Hall & Stewart, LLP and coordinated by John Lanza (BEE ’87, MSEE ’88) – a member of the ECE campaign steering committee and one of our donors this past year.
On April 22, 2009 ECE held its eighth annual Roger P. Webb Awards Program at the Christopher W. Klaus Advanced Computing Building. Georgia Power Vice President Leslie Sibert (BEE ‘85) and Atlanta area venture capitalist Steve W. Chaddick (BEE ’74, MSEE ’82) co-hosted the event, which honors the students, staff, and faculty who have shown exceptional dedication to their professions and studies. Areva NP provided additional support for this event.

STUDENT AWARDS

Outstanding ECE Sophomore Award
Duncan Osborn

ECE Junior Scholar Award
Tian Kai Woon

ECE Undergraduate Research Award
Temitope Muftau Alausa

Most Outstanding ECE Senior Co-op Award
Aaron Kane

Outstanding Service to Georgia’s Community Award
Melissa Watkins

ECE Faculty Award
Nicole Rennalls

Outstanding Electrical Engineering Senior Award
John Bradley Hamilton

Outstanding Computer Engineering Senior Award
Jagdish Ramakrishnan

ECE Senior Scholar Award
Derek R. Bankeris, Matthew Tyler Brown, Nathan Cody Jones, Daniyal Hafeez Khan, Michael Pribble, Tian Kai Woon

Colonel Oscar P. Cleaver Awards
Elias Chavarria Reyes, Josep Miquel Jornet Montana

ECE Graduate Teaching Assistant Excellence Award
Sandeep Kakumanu

ECE Graduate Research Assistant Excellence Awards
Joshua Griffin, Wei Zhang

STAFF AWARDS

Hats Off Performance Awards
Patricia Dixon, Siri Melkote

Research Spotlight Award
RongLin Li

Academic Spotlight Award
Allen Robinson

Georgia Institute of Technology Awards

Georgia Tech Faculty Awards
(April 15)

Outstanding Doctoral Thesis Advisor Award
Ian F. Akyildiz

Outstanding Professional Education Award
Christopher F. Barnes

Class of 1940 W. Roane Beard Outstanding Teacher Award
George F. Riley

Outstanding Innovative Use of Education Technology Award
D. Scott Wills, Linda M. Wills

Georgia Tech Student Honors Day
(April 23)

Alvin M. Ferst Leadership and Entrepreneur Scholarship Award
Garrett Langley

James G. and Mary G. Wohlford Scholarship
Alejandro Suarez

AESO Systems Graduate Minority Engineering Award
Billy M. Kihei

Henry Ford II Scholar Award
Eleazer Walter Kenyon, Duncan Keith Osborn
Student Body

Profile

Students are ECE’s most important products. Almost 2,300 students were enrolled in our graduate and undergraduate programs during FY 09, making the School’s programs the largest in the U.S. In the last academic year, 705 degrees were awarded to students at the main campus in Atlanta, Georgia Tech-Savannah, Georgia Tech-Lorraine, and to students enrolled in the online master’s/video program.

Undergraduate electrical engineering and computer engineering majors may participate in three different academic initiatives at Georgia Tech—the International Plan, Cooperative Education Plan, and Research Option. Students who successfully complete these programs receive special degree designations on their diplomas. In 2008-09, ECE had 43 co-op graduates, one graduate of the international plan, and one who received both the co-op and international plan designators.

<table>
<thead>
<tr>
<th>Average Entering EE Freshman</th>
<th>Average Entering CmpE Freshman</th>
<th>Average Entering Graduate Student</th>
<th>Campus/Program ECE Enrollments Fall 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school GPA</td>
<td>3.77</td>
<td>High school GPA</td>
<td>3.80</td>
</tr>
<tr>
<td>SAT verbal score</td>
<td>607</td>
<td>SAT verbal score</td>
<td>631</td>
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<tr>
<td>SAT math score</td>
<td>727</td>
<td>SAT math score</td>
<td>710</td>
</tr>
<tr>
<td>GRE verbal score</td>
<td>555</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Enrollment (Fall 2008)</th>
<th>Total</th>
<th>Not Reported</th>
<th>Asian</th>
<th>Black</th>
<th>Hispanic</th>
<th>American Indian/Alaskan Native</th>
<th>White</th>
<th>Multi-Racial</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.S.E.E.</td>
<td>768</td>
<td>5</td>
<td>249</td>
<td>79</td>
<td>49</td>
<td>1</td>
<td>382</td>
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<td>B.S.Cmp.E.</td>
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<td>7</td>
<td>95</td>
<td>38</td>
<td>22</td>
<td>1</td>
<td>208</td>
<td>1</td>
<td>19</td>
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<td>1</td>
<td>3</td>
<td>2</td>
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<tr>
<td>B.S.Cmp.E./GT-Savannah</td>
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<td>12</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>2</td>
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<tr>
<td>Total</td>
<td>1,197</td>
<td>1%</td>
<td>29%</td>
<td>11%</td>
<td>6%</td>
<td>&lt;1%</td>
<td>52%</td>
<td>&lt;1%</td>
<td>9%</td>
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<tr>
<td>M.S./M.S.E.C.E.</td>
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<td>19</td>
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<td>Ph.D. Robotics*</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>Total**</td>
<td>1,096</td>
<td>51%</td>
<td>5%</td>
<td>4%</td>
<td>&lt;1%</td>
<td>38%</td>
<td>2%</td>
<td>13%</td>
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<td>Grand Total**</td>
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Degrees Awarded

(Summer 2008-Spring 2009)

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<tr>
<th>Total</th>
<th>Asian</th>
<th>Black</th>
<th>Hispanic</th>
<th>White</th>
<th>Multi-Racial</th>
<th>American Indian/Alaskan Native</th>
<th>Female</th>
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<tbody>
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<td>B.S.E.E.</td>
<td>195</td>
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<td>B.S.Cmp.E.</td>
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<td>1</td>
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<td>2</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>268</td>
<td>31%</td>
<td>11%</td>
<td>4%</td>
<td>53%</td>
<td>1</td>
<td>%0</td>
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<td>M.S.</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
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<td>164</td>
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<td>16</td>
<td>139</td>
<td>6</td>
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<tr>
<td>M.S.E.C.E./GT-Savannah</td>
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<td>2</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>M.S. Bioeng.*</td>
<td>1</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>Total**</td>
<td>437</td>
<td>50%</td>
<td>4%</td>
<td>4%</td>
<td>40%</td>
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<tr>
<td>Grand Total**</td>
<td>705</td>
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<td></td>
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</tbody>
</table>

* With home department in ECE.

** Degree and enrollment totals also include GTL, M.S. dual degree programs with Shanghai Jiao Tong University and Politecnico di Torino, and online/video master’s.

Fellowships/Scholarships

Jiahui Yuan received a 2008 IEEE Electron Devices Society Ph.D. Student Fellowship Award. He is working to better define the ultimate speed limits of silicon germanium heterojunction bipolar transistors and to uncover new device physics phenomena in these operating temperature extremes. A member of the SiGe Devices and Circuits Group, Mr. Yuan is advised by John Cressler.

Shreyas Sen received a 2008 IEEE Microwave Theory and Techniques Society Graduate Fellowship Award. His research focuses on adaptive RF circuits and systems for low power, multi-standard, and future software radio applications. Advised by Abhijit Chatterjee, Mr. Sen works in the Testing and Reliability Engineering Laboratory.

Ann Trippe received an IEEE Microwave Theory and Techniques Society Undergraduate/Pre-Graduate Scholarship. A senior electrical engineering major, Ms. Trippe works on X-band RF amplifiers integrated in an organic-based platform. Potential applications for this research include communication, radar, and sensing systems. She works in the Microwave Circuit Technology Group, which is led by John Papapolymerou.

Timothy-Allen Brewington was named the first recipient of the Kevin Brennan Memorial Scholarship in fall 2008. Originally from Durham, N.C., Mr. Brewington is a sophomore co-op student majoring in electrical engineering. He is in the Honors Program and is involved with undergraduate recruiting efforts at Georgia Tech.

Friends, colleagues, and family united to honor the memory of ECE Professor Kevin Brennan, who passed away in 2003 after a valiant battle with pancreatic cancer. This endowed scholarship will be given annually to a deserving EE or CmpE student.
## Ph.D. Graduates

Ninety-five students graduated with their doctoral degrees in 2008-09 and have moved on to work at the world’s top companies and universities and with start-up companies originating from research at Georgia Tech. Students are grouped by semesters of graduation; advisors, dissertation titles, and employment status are also listed.

### Summer 2008

<table>
<thead>
<tr>
<th>Name</th>
<th>Advisor/Co-advisor</th>
<th>Dissertation Title</th>
<th>Employment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert Baxley Zhou</td>
<td></td>
<td>OFDM Communications over Peak-Limited Channels</td>
<td>Research engineer II, Georgia Tech Research Institute, Information Technology and Telecommunications Laboratory, Atlanta, Ga.</td>
</tr>
<tr>
<td>Arnaud Bistroquet Skinjar</td>
<td></td>
<td>Cardiac Motion Recovery from Magnetic Resonance Images Using Incompressible Deformable Models</td>
<td>Not known.</td>
</tr>
<tr>
<td>Matthieu Bloch McLaughlin</td>
<td></td>
<td>Physical-Layer Security</td>
<td>Assistant professor, School of ECE, Georgia Tech-Lorraine, Metz, France</td>
</tr>
<tr>
<td>Mehmet Demircin Altunbasak</td>
<td></td>
<td>Robust Video Streaming over Time-Varying Wireless Networks</td>
<td>Member of technical staff, Texas Instruments, Dallas, Tex.</td>
</tr>
<tr>
<td>Sudhanshu Gaur Ingram</td>
<td></td>
<td>Interference Management in MIMO Networks</td>
<td>Senior researcher, Hitachi America, Santa Clara, Calif.</td>
</tr>
<tr>
<td>Ali Gurbuz McClellan</td>
<td></td>
<td>Feature Detection Algorithms in Computed Images</td>
<td>Assistant professor, TOBB University of Economics and Technology, Ankara, Turkey</td>
</tr>
<tr>
<td>Muhammad Haris Chang and Yu</td>
<td></td>
<td>Advanced Modulation Formats for High Bit-Rate Optical Networks</td>
<td>Research engineer, Tyco Telecommunications, Eatontown, N.J.</td>
</tr>
<tr>
<td>Omkar Jani Honsberg and Ferguson</td>
<td></td>
<td>Development of Wide-Band Gap InGaN Solar Cells for High-Efficiency Photovoltaics</td>
<td>CEO, Kanoda, Inc., Ahmedabad, Gujarat, India</td>
</tr>
<tr>
<td>Arash Karbaschi Adibi</td>
<td></td>
<td>Dynamic Pattern Recognition and Data Storage Using Localized Holographic Recording</td>
<td>Senior research engineer, ProSpect Photonics, Inc., Atlanta, Ga.</td>
</tr>
<tr>
<td>Sita Krishnakumar Abler</td>
<td></td>
<td>Intelligent Actor Mobility in Wireless Sensor and Actor Networks</td>
<td>Not known.</td>
</tr>
<tr>
<td>Michael Levy Citrin and Honberg</td>
<td></td>
<td>Design, Experiment, and Analysis of a Photovoltaic Absorbing Medium with Intermediate Levels</td>
<td>Postdoctoral research fellow, Institute for Solar Energy, Polytechnical University of Madrid, Madrid, Spain</td>
</tr>
<tr>
<td>Xiaohang Li Cressler</td>
<td></td>
<td>High-Speed Analog-to-Digital Conversion in SiGe HBT Technology</td>
<td>Senior design engineer, Cadence Corporation, San Jose, Calif.</td>
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<tr>
<td>Kofi Odame Hasler</td>
<td></td>
<td>Exploiting Device Nonlinearity in Analog Circuit Design</td>
<td>Assistant professor, Thayer School of Engineering, Dartmouth University, Hanover, N.H.</td>
</tr>
<tr>
<td>Bo Pan Papapolymerou and Tentzeris</td>
<td></td>
<td>Development of Micromachined Millimeter-Wave Modules for Next-Generation Wireless Transceiver Front-Ends</td>
<td>Research scientist, Realtek Semiconductor Group, Irvine, Calif.</td>
</tr>
<tr>
<td>Sheng-Yu Peng Hasler</td>
<td></td>
<td>Charge-Based Analog Circuits for Reconfigurable Smart Sensory Systems</td>
<td>Analog IC designer, Gtronix, Inc., Dallas, Tex.</td>
</tr>
<tr>
<td>Wei Qiao Harley</td>
<td></td>
<td>Integrated Control of Wind Farms, FACTS Devices, and the Power Network using Neural Networks and Adaptive Critic Designs</td>
<td>Assistant professor, Department of Electrical Engineering, University of Nebraska, Lincoln, Neb.</td>
</tr>
<tr>
<td>Mina Raijeshzadeh Ayazi</td>
<td></td>
<td>Wafer-Level Encapsulated High-Performance MEMS Tunable Passives and Bandpass Filters</td>
<td>Assistant professor, Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Mich.</td>
</tr>
<tr>
<td>Subramanian Ramaswamy Yalamanchili</td>
<td></td>
<td>Active Management of Cache Resources</td>
<td>Program manager, Microsoft Corporation, Redmond, Wash.</td>
</tr>
<tr>
<td>Alan Ristow Rohatgi and Begovic</td>
<td></td>
<td>Numerical Modeling of Uncertainty and Variability in the Technology, Manufacturing, and Economics of Crystalline Silicon Photovoltaics</td>
<td>R&amp;D engineer, Photovoltech NV, Tienen, Belgium</td>
</tr>
<tr>
<td>James David Ross DeWeerth</td>
<td></td>
<td>Microsimulation and Multicellular Analysis: A Neural Interfacing System for Spatio Temporal Stimulation</td>
<td>Chief Science Officer, Axion Biosystems, Atlanta, Ga.</td>
</tr>
<tr>
<td>Ying Xia Owen</td>
<td></td>
<td>Establishing Trust in Encrypted Software</td>
<td>Naval Undersea Warfare Center, Newport, R.I.</td>
</tr>
<tr>
<td>George Yu Janata and Hunt</td>
<td></td>
<td>Magnetic Quartz Crystal Microbalance</td>
<td>CEO, Genél, Inc., Atlanta, Ga.</td>
</tr>
<tr>
<td>Yanhu Zhao Allen</td>
<td></td>
<td>Metal-Transfer-Molding Technique for Micromachined RF Components</td>
<td>Senior research engineer, Medtronic, Minneapolis, Minn.</td>
</tr>
</tbody>
</table>

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Fall 2008

David Abramson Hasler A MITE-Based Translinear FPAA and Its Practical Implementation Project manager, Texas Instruments, Manchester, N.H.

Zafer Aydin Altunbasak and Borobovsky Bayesian Models and Algorithms for Protein Secondary Structure and Beta-Sheet Prediction Postdoctoral fellow, Genome Sciences, University of Washington, Seattle, Wash.


Soo Hyun Bae Juang Information Retrieval via Universal Source Coding Senior research engineer, Sony U.S. Research Center, San Jose, Calif.

Jehanzeb Burki Barnes Fast Circular Aperture Synthesis in SAR All-Aspect Target Imaging Manager, Government of Pakistan, Peshawar, NWFP, Pakistan

Lauren Burrel Vachtsevanos Feature Analysis of Functional MRI Data for Mapping Epileptic Networks Software engineer level 3, Harris Corporation, Melbourne, Fl.


Deepak Chandra Sekar Meindl and Davis Optimal Signal, Power, Clock, and Thermal Interconnect Networks for High-Performance 2D and 3D Integrated Circuits Senior engineer, SanDisk Corporation, Sunnyvale, Calif.

Anthony Jerome Dickherber Hunt Design and Implementation of an Acoustic Resonator Based Biosensor System for the Early Detection of Prostate Cancer Fellow, American Association for the Advancement of Science, Washington, D.C.

Andreas Haldi Kippelen Patterned Electro phosphorescent Organic Light-Emitting Diodes with Solution-Processed Organic Layers Customer project manager, Novaled AG, Dresden, Germany

Cyrus Harves Blough The Design and Implementation of a Robust, Cost-Conscious Peer-to-Peer Lookup Service Software design engineer II, Microsoft Corporation, Seattle, Wash.

Jean Carlos Hernandez Mejia Harley Characterization of Real Power Defects by Diagnostic Measurements Assistant professor, Universidad de Los Andes-Mérida-Venezuela, Mérida, Mérida, Venezuela


Sannathi Kamath Jackson Video Analysis and Compression for Surveillance Applications Texas Instruments, Dallas, Tex.

Muhammad Faisal Khan Skirjar Non-Rigid Image Registration for Deep Brain Stimulation Surgery Assistant professor, National University of Sciences and Technology, Rawalpindi, Punjab, Pakistan

Joong Kim Ralph Efficient Terahertz Photoconductive Source Electronics engineer, Naval Surface Warfare Center, Intelligent Sensing Branch, Panama City, Fla.


Vichai Meemongkolkit Rongtgi Development of High Efficiency Monocrystalline Si Solar Cells through Improved Optical and Electrical Confinement Samsung, South Korea

Joshua Perkel Begovic The Influence of Critical Asset Management Facets on Improving Reliability in Power Systems Research engineer, Georgia Tech, NEETRAC, Atlanta, Ga.


David Reid G. Smith A Full Electromagnetic Analysis of Fresnel Zone Plate Antennas and the Application to a Free-Space Focused-Beam Measurement System Research engineer II, Georgia Tech Research Institute, Signature Technology Laboratory, Atlanta, Ga.

Reza Sarvari Meindl Impact of Size Effects and Anomalous Skin Effect on Metallic Wires as GSI Interconnects Instructor, Sharif University of Technology, Tehran, Iran

Kun Shi Zhou Nonlinear Acoustic Echo Cancellation System engineer, Texas Instruments, Dallas, Tex.

Mikkel Thomas Jokser and Laskar Integrated Optical Interferometric Sensors on Silicon and Silicon CMOS Research engineer II, Microelectronics Research Center, Georgia Tech, Atlanta, Ga.

Yu Tsao C.H. Lee Ensemble Speaker and Speaking Environment Modeling Approach to Robust Speech Recognition Researcher, National Institute of Information and Telecommunications Technology, Kyoto, Japan

Badri Vellambi Fekri Applications of Graph-Based Codes in Networks: Analysis of Capacity and Design of Improved Algorithms Research fellow, Institute for Telecommunications Research, University of South Australia, Adelaide, Australia

Edem Wonyo May and Gall Fabrication and Characterization of Shape Memory Polymers for Small-Scale Applications Process engineer, IBM Semiconductor Research and Development Center, Hopewell Junction, N.Y.


Alenka Zajic Stuber Space-Time Channel Modeling, Simulation, and Coding Postdoctoral research fellow, Naval Research Laboratory, Washington, D.C. (to join Georgia Tech College of Computing in July 2010)
Spring 2009

Joel Andrews
Cressler
Design of SiGe HBT Power Amplifiers for Microwave Radar Applications
Senior RF design engineer, Garmin, Inc., Kansas City, Mo.

Senyo Apewokin
S. Wills and L. Wills
Efficiently Mapping High-Performance Early Vision Algorithms onto Multicore Embedded Platforms
Processor Design, Texas Instruments, Dallas, Tex.

Tank Arici
Alturbasask
Energy-Efficient Sensor Data Acquisition
Video research engineer, NVIDIA, Santa Clara, Calif.

Marco Bellini
Cressler
Operation of Silicon-Germanium Heterojunction Bipolar Transistors on Silicon-on-Insulator in Extreme Environments
Senior TCAD engineer, ABB, Inc., Zurich, Switzerland

Krishna Bharath
Swaminathan
Signal and Power Integrity Co-Simulation Using the Multi-Layer Finite Difference and Finite Element Methods
Packaging Engineer, Intel Corporation, Chandler, Ariz.

Alexander Carver
Doolittle
Novel Chlorine-Based Chemistry and Implementation Hardware for the Growth of Lithium Niobate and Related Complex Metal Oxides
Staff Engineer, NASA Jet Propulsion Lab, Pasadena, Calif.

Binh Dam
Melopoulos
Operating Strategies to Preserve the Adequacy of Power Systems Circuit Breakers
Not known.

Jacqueline Fairley
Vachtsevanos
Statistical Modeling of the Human Sleep Process via Physiological Recordings
Postdoctoral Fellow, Emory University, Atlanta, Ga.

Minimoy Ghosh
H. H. S. Lee
Microarchitectural Techniques to Reduce Energy Consumption in the Memory Hierarchy
Research staff member, ARM, Austin, Tex.

Joshua Griffin
Durgin
High Frequency Modulated Backscatter Communication Using Multiple Antennas
Postdoctoral associate, Disney Research, Pittsburgh, Pa.

Shalini Gupta
Ferguson
Growth of Novel Wide Bandgap Room Temperature Ferromagnetic Semiconductor for Spintronic Applications
Not known.

Philip Jones
Vachtsevanos
Cooperative Area Surveillance Strategies Using Multiple Unmanned Systems
Senior engineer, Adaptive Flight, Atlanta, Ga.

Vivek Krishnamurthy
Klein
Theoretical Investigation of Photonic Crystal and Metal Cladding for Waveguides and Lasers
Senior research fellow, Data Storage Institute, Singapore

Christopher Lee
Copeland
Framework for Botnet Emulation and Analysis
Research engineer, Shadowsorve.org, Hanover, Md.

Kysung-Keun Lee
Doolittle
Implementation of AlGaN/GaN Based High Electron Mobility Transistor on Ferroelectric Materials for Multifunctional Optoelectronic-Acoustic-Electronic Applications
Postdoctoral fellow, Texas Southern University, Houston, Tex.

Clyde Lettsome
M. J. T. Smith and Mensereau
Fixed-Analysis Adaptive-Synthesis Filter Banks
Postdoctoral fellow/consultant, Calabrix Corporation, Atlanta, Ga.

Nola Li
Summers
GaN on ZnO: A New Approach to Solid State Lighting
Postdoctoral fellow, National Taiwan University, Taipei, Taiwan

Yu-Xi Lim
Owen
Efficient Wireless Location Estimation through Simultaneous Localization and Mapping
Microsoft Corporation, Redmond, Wash.

Haw-Jing Lo
Anderson
Design of a Reusable Distributed Arithmetic Filter and its Application to the Affine Projection
Senior engineer, Qualcomm, Inc., San Diego, Calif.

John Melonakos
Tannenbaum
Geodesic Tractography Segmentation for Directional Medical Image Analysis
Co-founder and CEO, AccelerEyes, Atlanta, Ga.

Kianoush Naeli
Brand
Optimization of Piezoresistive Cantilevers for Static and Dynamic Sensing Applications
Postdoctoral fellow, George W. Woodruff School of Mechanical Engineering, Georgia Tech, Atlanta, Ga.

David Pritchett
Doolittle
Novel III-Nitride Growth by Ultraviolet Radiation Assisted Metal Organic Molecular Beam Epitaxy for Multifunctional Optoelectronic-Acoustic-Electronic Applications

Branislav Radibraovic
Begovic
Reactive Optimization of Transmission and Distribution of Networks
Director for Power Engineering, EDSA, San Diego, Calif.

Swaminathan Rajaraman
M. Allen
Micromachined Three-Dimensional Electrode Arrays for In-Vitro and In-Vivo Electrogenic Cellular Networks

Ryan Robucci
Hasler
Development of a Computational Image Sensor with Applications in Integrated Sensing and Processing
Assistant professor, Department of Computer Science and Electrical Engineering, University of Maryland at Baltimore County, Baltimore, Md.

Richard Shilling
Mersereau and Brummer
A Multi-Stack Framework in Magnetic Resonance Imaging
Not known.

Brian Smith
Egerstedt and Howard
Automatic Coordination and Deployment of Multi-Robot Systems
Member of technical staff, NASA Jet Propulsion Laboratory, Pasadena, Calif.

Todd Hamilton Stokes
M. Wang
Development of a Visualization and Information Management Platform in Translational Biomedical Informatics
Postdoctoral fellow, Emory-Georgia Center for Cancer Nanotechnology Excellence, Emory University, Atlanta, Ga.

Sze Ho Tang
Mersereau
Self-Correcting Multi-Channel Blind Deconvolution Using Expectation Maximization Algorithm and Feedback
Essex Corporation, Columbia, Md.

Thanh Thao Tran
Zhou
Genomic Data Mining for the Computational Prediction of Small Non-Coding RNA Genes
Computer systems research, U.S. Department of Defense, Metropolitan Washington, D.C.

Elaissa Trybus
Doolittle
Molecular Beam Epitaxy Growth on InN and InxGa1-xN Materials for Photovoltaic Applications
Microelectronics Process Engineer, Associate Professional Staff I, Johns Hopkins University, Laurel, Md.

Nikolaos Vasiloglou
Anderson and Gray
Isometry and Convexity in Dimensionality Reduction
Founder and CTO, Analytics 1305 LLC, Atlanta, Ga.

Xiaohong Zhang
Kippelen
 Device Engineering of Organic Field-Effect Transistors for Complementary Circuits
Seeking employment
Faculty

ECE faculty members are internationally recognized leaders in 10 areas of research and education—bioengineering, computer engineering, digital signal processing, electrical energy, electromagnetics, electronic design and applications, microsystems, optics and photonics, systems and controls, and telecommunications—and the School is either home to or a key player in more than 20 research centers and consortia.

One hundred fifteen faculty members were employed during 2008-09, with 80 percent holding tenure and all holding doctorates. In the last year, ECE added three new faculty members to its ranks and promoted and/or tenured six.

Promotions to Professor
Ali Adibi, Anthony J. Yezzi, Jr.

Promotions to Associate Professor with Tenure
Hsien-Hsin Sean Lee

Tenure
Christopher F. Barnes, Jennifer E. Michaels, Linda S. Milor

New Faculty

Bo Hong
Assistant Professor
Research interests: High performance computing; multicore computer architecture; multi-processor synchronization; parallel and multi-threaded algorithms; distributed computing

Azad J. Naeemi
Assistant Professor
Research interests: Emerging nanoelectronic devices and circuits; carbon nanotube and graphene interconnects and transistors; circuit and system implications of emerging devices; design and optimization for nanoscale interconnects and transistors

Christopher J. Rozell
Assistant Professor
Research interests: Statistical signal processing; theoretical and computational neuroscience; low-dimensional models in signal processing and neural coding; sparse approximation; image/video processing, analysis, and compression; time series analysis and prediction

Promoted/Tenured in FY 2009

Faculty Profile

<table>
<thead>
<tr>
<th>Rank</th>
<th>Tenured</th>
<th>Diversity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Regents' Professors</td>
<td>4 Regents' Professors</td>
<td>12 Female</td>
</tr>
<tr>
<td>61 Professors</td>
<td>60 Professors</td>
<td>4 African-American</td>
</tr>
<tr>
<td>30 Associate Professors</td>
<td>28 Associate Professors</td>
<td>27 Asian</td>
</tr>
<tr>
<td>20 Assistant Professors</td>
<td></td>
<td>2 Hispanic</td>
</tr>
<tr>
<td>115 Total*</td>
<td></td>
<td>1 Multi-racial</td>
</tr>
</tbody>
</table>

* Includes all faculty members employed during FY 09, including those permanently based at Georgia Tech-Savannah and Georgia Tech-Lorraine.

Academic Faculty

REGENTS’ PROFESSORS

Mark G. Allen
Senior Vice Provost for Research and Innovation; Joseph M. Pettit Professor in Microelectronics; Co-Director, Center for MEMS and Microsystems Technologies
Ph.D., Massachusetts Institute of Technology

Thomas K. Gaylord
Julius Brown Chair Professor
Ph.D., Rice University

Ronald G. Harley
Duke Power Company Distinguished Professor (promoted to Regents’ Professor, effective July 1, 2009)
Ph.D., London University

Ph.D., London University

2009 IEEE Richard Harold Kaufman Award “for contributions to monitoring, control, and optimization of electrical processes including electrical machines and power networks”

Ajeet Rohatgi
Georgia Power Distinguished Professor; Director of the University Center of Excellence for Photovoltaics Research and Education
Ph.D., Lehigh University

Electrical engineering

2009 Georgia Tech Outstanding Doctoral Thesis Advisor Award; 2009 ECE Distinguished Mentor Award

Ian F. Akyildiz
Byers Professor in Telecommunications
Ph.D., University of Erlangen Telecommunications

John R. Barry
Ph.D., University of California at Berkeley

Miroslav M. Begovic
Ph.D., Virginia Polytechnic Institute and State University

Electrical energy

Douglas M. Blough
Co-Director, Center for Experimental Research in Computer Systems
Ph.D., The Johns Hopkins University

Computer engineering

John A. Buck
Ph.D., University of California at Berkeley

Electromagnetics; optics and photonics

Gee-Kung Chang
Byers Endowed Professor in Optical Networking and GSA Eminent Scholar
Ph.D., University of California at Riverside

Optics and photonics; telecommunications

Abhijit Chatterjee
Ph.D., University of Illinois at Urbana-Champaign

Computer engineering

David S. Citrin
Ph.D., University of Illinois at Urbana-Champaign

Optics and photonics

Mark A. Clements
Joseph M. Pettit Professor in Digital Signal Processing (effective July 1, 2008); Director, Interactive Media Technology Center
Sc.D., Massachusetts Institute of Technology

Bioengineering; digital signal processing

John A. Copeland
John H. Weitnauer, Jr. Technology Transfer Chair; GSA Eminent Scholar; and Director, Communications Systems Center
Ph.D., Georgia Institute of Technology Telecommunications
Edward J. Coyle
Arbutus Chair for the Integration of Research and Education; GRA Eminent Scholar; and Director, Arbutus Center for the Integration of Research and Education
Ph.D., University of Delaware
Digital signal processing

John D. Cressler
Byers Professor
Ph.D., Columbia University
Electronic design and applications; Microsystems

Deepak Divan
Director, Intelligent Power Infrastructure Consortium
Ph.D., University of Calgary
Electrical energy

John F. Dorsey
Ph.D., Michigan State University
Systems and controls

Russell D. Dupuis
Steve W. Chaddick Endowed Chair in Electro-Optics; GRA Eminent Scholar; and Director, Center for Compound Semiconductors
Ph.D., University of Illinois at Urbana-Champaign
Microsystems; optics and photonics

Ian T. Ferguson
Ph.D., University of St. Andrews in Scotland
Microsystems; optics and photonics
2009 SPIE Fellow “for his pioneering contributions to the development of III-V materials and devices for solid state lighting, detectors, and solar cell applications”

Bonnie Heck Ferri
Associate Chair for ECE Graduate Affairs
Ph.D., Georgia Institute of Technology
Computer engineering; systems and controls

A. Bruno Frazier
Co-Director, Center for MEMS and Microsystems Technologies
Ph.D., Georgia Institute of Technology
Bioengineering; Microsystems

Thomas G. Habetler
Ph.D., University of Wisconsin at Madison
Electrical energy
2008 Outstanding Achievement Award from the European Power Electronics and Motion Control Council “for contributions to electric machine condition monitoring and control, as well as promotion and advocacy of power electronics and motion control technology to the technical community”

James O. Hamblien
Ph.D., Georgia Institute of Technology
Computer engineering

Joseph L.A. Hughes
Senior Associate Chair
Ph.D., Stanford University
Computer engineering; Microsystems; telecommunications
2009 ECE Outreach Award

William D. Hunt
Ph.D., University of Illinois at Urbana-Champaign
Bioengineering; Microsystems

Mary Ann Ingram
ADVANCE Professor of Engineering
Ph.D., Georgia Institute of Technology
Telecommunications

Nikil S. Jayant
Executive Director, Georgia Centers for Advanced Telecommunications Technology; Director, Georgia Tech Broadband Institute; John Pippin Chair in Wireless Systems; and GRA Eminent Scholar
Ph.D., Indian Institute of Science, Bangalore
Computer engineering; telecommunications

Indian Institute of Science Distinguished Alumnus Award

Biing-Hwang (Fred) Juang
Motorola Foundation Chair Professor and GRA Eminent Scholar
Ph.D., University of California at Santa Barbara
Digital signal processing; telecommunications

David C. Keever
Ph.D., Carnegie-Mellon University
Computer engineering; Microsystems

Bernard Kippelen
Associate Director, Center for Organic Photonics and Electronics; Associate Director, Materials and Devices for the Information Technology Research Center
Ph.D., Université Louis Pasteur
Microsystems; optics and photonics

Joy Laskar
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Ph.D., University of Illinois at Urbana-Champaign
Electromagnetics; electronic design and applications; Microsystems

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Electromagnetics; electronic design and applications; Microsystems

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Digital signal processing

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Ph.D., Auburn University
Telecommunications

Vijay K. Madisetti
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Computer engineering; digital signal processing

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James H. McClellan
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Ph.D., Rice University
Computer engineering; digital signal processing

Steven W. McLaughlin
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Ph.D., University of Michigan at Ann Arbor
Telecommunications
2008-09 Georgia Tech University Leadership Program Fellow; 2009 ECE Distinguished Faculty Achievement Award

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Electrical energy; systems and controls

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Computer engineering; telecommunications

Madhavan Swaminathan
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Computer engineering; electromagnetics

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Bioengineering; systems and controls
2009 IEEE Fellow “for contributions to robust control and computer vision”

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Systems and controls

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Computer engineering
2009 Georgia Tech Outstanding Innovative Use of Education Technology Award; 2008 Richard M. Bass/Eta Kappa Nu Outstanding Teacher Award

Marilyn C. Wolf
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2008-09 Georgia Tech University Leadership Program Fellow

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Electromagnetics; electronic design and applications
2009 Outstanding Young Engineer Award of the IEEE Microwave Theory and Techniques Society; 2009 ECE Outstanding Junior Faculty Member Award

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Electrical energy; electronic design and applications
2009-10 Distinguished Lecturer for the IEEE Circuits and Systems Society; 2009 Institution of Engineering and Technology Fellow

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Raghupathy Sivakumar
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Xiaoli Ma
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Digital signal processing
2009 Lockheed Martin Aeronautics Company Dean’s Award for Teaching Excellence

Saibal Mukhopadhyay
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Microsystems; computer engineering

Azad Naeemi
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Digital signal processing
2008 Presidential Early Career Award for Scientists and Engineers

Christopher J. Rozell
Ph.D., Rice University
Bioengineering; digital signal processing

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PROFESSOR OF THE PRACTICE

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Ghassan AlRegib
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Digital signal processing; telecommunications

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NSF CAREER Award

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Ying Zhang
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University of Illinois at Urbana-Champaign

ASSISTANT PROFESSOR

Paul L. Voss
Demetrius T. Paris Professor
Ph.D., Northwestern University
Optics and photonics

GEORGIA TECH/ECE

ATDC – Advanced Technology Development Center
CEISMC – Center for Education Integrating Science, Mathematics, and Computing
CAP – Corporate Affiliates Partnership Program
CoC – College of Computing
CoE/CoE – College of Engineering
CSIP – Center for Signal and Image Processing
ECE – Electrical and Computer Engineering
EPICS – Engineering Projects in Community Service
GCATT – Georgia Centers for Advanced Telecommunications Technology
GEDC – Georgia Electronic Design Center
GT – Georgia Tech
GTF – Georgia Tech Foundation
GTL – Georgia Tech-Lorraine
GTRI – Georgia Tech Research Institute
GTS – Georgia Tech-Savannah
TIG – Technical Interest Group
VIP – Vertically Integrated Projects (Program)

COMPANIES AND ORGANIZATIONS

ASES – American Solar Energy Society
EDS – Electron Devices Society (a technical interest society of IEEE)
FIRST – For Inspiration and Recognition of Science and Technology
GRA – Georgia Research Alliance
HKN – Eta Kappa Nu
IEEE – Institute of Electrical and Electronics Engineers
IFIP – International Federation for Information Processing
MTTS – Microwave Theory and Techniques Society (a technical interest society of IEEE)

NSBE – National Society of Black Engineers
SFC – Student-Faculty Committee
TAG – Technology Association of Georgia
WECE – Women in Electrical and Computer Engineering

GOVERNMENTAL AGENCIES AND UNIVERSITIES

NASA – National Aeronautics and Space Administration
NSF – National Science Foundation
ONR – Office of Naval Research

TECHNICAL OR GENERAL ABBREVIATIONS

2D – Two-Dimensional
3D – Three-Dimensional
AlGaN – Aluminum Gallium Nitride
CEO – Chief Executive Officer
CMOS – Complementary Metal Oxide Semiconducotor
CmpE – Computer Engineering
CPU – Central Processing Unit
CSO – Chief Science Officer
CTO – Chief Technical Officer
DSP – Digital Signal Processing
EE – Electrical Engineering
FACTS – Flexible A.C. Transmission System
FDTD – Finite-Difference Time-Domain
FFAA – Field-Programmable Analog Array
FY – Fiscal Year
G – Gigabit
GaN – Gallium Nitride
Gb – Gigabyte
Gbps – Gigabyte per Second
GHz – Gigahertz

GPA – Grade Point Average
GPU – Graphical Processing Unit
GRE – Graduate Record Exam
GSI – Gigascale Integration
HTB – Heterojunction Bipolar Transistor
IC – Integrated Circuit
InGaN – Indium Gallium Nitride
InN – Indium Nitride
MATE Center – Marine Advanced Technology Education Center
MEMS – Microelectromechanical Systems
MIMO – Multiple Input Multiple Output
MITE – Multiple-Input Translinear Element
MRI – Magnetic Resonance Imaging
NFWP – Northwest Frontier Province (Pakistan)
OFDM-Orthogonal Frequency Division Multiplex
PECASE – Presidential Early Career Award in Science and Engineering
Q - Quality
R&D – Research and Development
RF – Radio Frequency
RF-DNA – Radio Frequency Deoxyribonucleic Acid
RFID – Radio Frequency Identification
RNA – Ribonucleic Acid
Si – Silicon
SiGe – Silicon Germanium
TCAD – Technology Computer Aided Design
VSIP – Vector, Signal, and Image Processing Library
ZnO – Zinc Oxide

Acronyms and Abbreviations in This Report...
Contact Information

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On the Cover
Throughout his 24-year career at Georgia Tech, ECE Regents’ Professor Ajeet Rohatgi has pushed the frontiers of photovoltaic cell performance and cost through research into the effects of impurities in silicon solar cells, the design and modeling of solar cells, and the development of new fabrication techniques that simultaneously speed manufacturing and reduce costs. He is the director of the University Center for Excellence in Photovoltaics Research and Education and the founder of Suniva, a start-up company based at Technology Park in Norcross. The company celebrated its official grand opening in December 2008.